



Nortel Communication Server 1000

IP Phones Fundamentals

Document status: Standard
Document version: 01.01
Document date: 30 May 2007

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Revision history

May 2007

Standard 01.01. This document is up-issued to support Communication Server 1000 Release 5.0. This document is renamed *IP Phones Fundamentals (NN43001-368)* and contains information previously contained in the following legacy document, now retired: (553-3001-368).

This document is also up-issued to include updates due to CR Q01605678 and CR Q01589713.

March 2007

Standard 23.00. This document is up-issued to support Communication Server 1000 Release 4.5. This document is up-issued to include updated information for Mobile Voice Client (MVC) 2050.

March 2007

Standard 22.00. This document is up-issued to support Communication Server 1000 Release 4.5. This document is up-issued to support the addition of the IP Phone 1110.

January 2007

Standard 21.00. Not issued.

November 2006

Standard 20.00. This document is up-issued to support the addition of the Expansion Module for IP Phone 1100 Series.

October 2006

Standard 19.00. This document is up-issued to include updated content due to CR Q01462514.

October 2006

Standard 18.00. This document is up-issued to support the addition of the IP Phone 1150E.

August 2006

Standard 17.00. This document is up-issued to include updated technical content due to CR Q01434634.

July 2006

Standard 16.00. This document is up-issued to include updated technical content for CR Q01337301.

June 2006

Standard 15.00. This document is up-issued to include UNISlim firmware up-version.

April 2006

Standard 14.00. This document is up-issued to include content for the IP Audio Conference Phone 2033 Release 2.

April 2006

Standard 13.00. Not issued.

March 2006

Standard 12.00. This document is up-issued to include updated content for the IP Softphone 2050 V2.

January 2006

Standard 11.00. This document is up-issued to include updated content for the IP Phone 1120E and IP Phone 1140E.

January 2006

Standard 10.00. This document is up-issued to include updated content for the IP Phone 1140E, on pages 405-412, and 509-530.

January 2006

Standard 9.00. This document is up-issued to reflect change in technical content on page 456 due to CR Q01233903.

November 2005

Standard 8.00. This document is up-issued to support the addition of IP Phone 1140E.

August 2005

Standard 7.00. This document is up-issued to support CS 1000 Release 4.5.

April 2005

Standard 6.00. This document is up-issued to support the addition of the IP Phone 2007.

April 2005

Standard 5.00. This document is up-issued to support the addition of the IP Audio Conference Phone 2033.

February 2005

Standard 4.00. This document is up-issued to support the 8.x Firmware Upgrade for IP Phones.

September 2004

Standard 3.00. This document is up-issued to support Communication Server 1000 Release 4.0.

June 2004

Standard 2.00. This document is up-issued to include the Nortel Networks Mobile Voice Client 2050.

October 2003

Standard 1.00. This document is a new NTP for Succession 3.0 Software. It was created to support a restructuring of the Documentation Library. This document contains information previously contained in the following legacy document, now retired: *Internet Terminals Description* (553-3001-217).

6 Revision history

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IP Phones Fundamentals
NN43001-368 01.01 Standard
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How to get Help

This chapter explains how to get help for Nortel products and services.

Getting help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. From this site, you can:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting help over the phone from a Nortel Solutions Center

If you do not find the information you require on the Nortel Technical Support Web site, and you have a Nortel support contract, you can also get help over the telephone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the telephone number for your region:

www.nortel.com/callus

Getting help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

New in this release

The following sections detail what is new in *IP Phones Fundamentals* (NN43001-368) for CS 1000 Release 5.0.

Features

See the following sections for information about feature changes:

- ["Live Dialpad" \(page 25\)](#)
- ["New IP Phone Types" \(page 25\)](#)
- ["New language support" \(page 26\)](#)
- ["Context-sensitive soft keys" \(page 27\)](#)

Live Dialpad

CS 1000 Release 5.0 introduces the Live Dialpad feature for IP Phones. Live Dialpad activates the primary Directory Number (DN) key when the user makes a call by dialing a DN on the dialpad, without picking up the handset or without pressing the Handsfree key.

For further information, see ["Features overview" \(page 425\)](#).

New IP Phone Types

CS 1000 Release 5.0 introduces the New IP Phone Types feature which adds new TN types to the Call Server and Line Terminal Proxy Server (LTPS) software.

The New IP Phone Types feature introduces the following:

- unique TN types for each IP Phone
- emulation mode for IP Phones which are not known by the Terminal Proxy Server (TPS) but have the same capabilities as IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Softphone 2050, or IP Phone 1150E
- automatic and manual IP Phone TN type conversion
- enhanced Model Names support so that Model Name information is accessible from LD 20 and Telephony Manager 3.1

Unique TN Types for existing IP Phones

The names of existing IP Phone TN types have a new IP Phone naming convention.

Table 1 "CS 1000 Release 5.0 TN type naming convention" (page 26) shows the unique IP Phone TN type naming convention for CS 1000 Release 5.0.

Table 1
CS 1000 Release 5.0 TN type naming convention

IP Phone model name	CS 1000 Release 4.5 TN_TYPE	CS 1000 Release 5.0 TN_TYPE
IP Phone 2001	i2001	2001P2
IP Phone 2002 Phase I	i2002	2002P1
IP Phone 2002 Phase II	i2002	2002P2
IP Phone 2004 Phase 0/1	i2004	2004P1
IP Phone 2004 Phase II	i2004	2004P2
IP Audio Conference Phone 2033	i2001	2033
IP Softphone 2050	i2050	2050PC
Mobile Voice Client 2050	i2050	2050MC
WLAN Handset 2210	i2004	2210
WLAN Handset 2211	i2004	2211
WLAN Handset 2212	i2004	2212
WLAN Handset 6120	Not applicable	6120
WLAN Handset 6140	Not applicable	6140
IP Phone 1110	i2001	1110
IP Phone 2007	i2004	2007
IP Phone 1120E	i2002	1120
IP Phone 1140E	i2004	1140
IP Phone 1150E	IPACD	1150

For further information, see *IP Line Fundamentals (NN43100-500)*.

New language support

CS 1000 Release 5.0 introduces support for new languages with complex fonts. Download font files as you need them by using the existing Trivial File Transfer Protocol (TFTP) Server configuration file method to upgrade the firmware on the IP Phone.

The following IP Phones support complex fonts:

- IP Phone 2007

- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

With the appropriate downloaded fonts, the IP Phone supports the following languages:

- Arabic
- Simplified Chinese
- Traditional Chinese
- Hebrew
- Japanese
- Korean

For further information about language support, see [Appendix "Language enhancement" \(page 527\)](#).

Context-sensitive soft keys

For further information about context-sensitive soft keys, see *New in This Release Communication Server Release 5.0 (NN43001-115)*.

Subject

This document contains description, installation, and administration information for the following:

- Nortel IP Audio Conference Phone 2033
- Nortel IP Phone 2001, IP Phone 2002, IP Phone 2004, and IP Phone 2007
- Nortel IP Phone Key Expansion Module (KEM)
- Nortel IP Softphone 2050
- Nortel Mobile Voice Client 2050 for Personal Digital Assistants (PDAs)
- Nortel IP Phone 1120E
- Nortel IP Phone 1140E
- Nortel IP Phone 1150E
- Nortel IP Phone 1110
- Expansion Module for IP Phone 1100 Series

Note on legacy products and releases

This NTP contains information about systems, components, and features that are compatible with Nortel Communication Server 1000 Release 5.0 software. For more information about legacy products and releases, click the **Technical Documentation** link under **Support** on the Nortel home page:

www.nortel.com

NTPs

This document references the following:

- *IP Phone 2001 User Guide (NN43115-102)*
- *IP Phone 2002 User Guide (NN43116-104)*
- *IP Phone 2004 User Guide (NN43117-102)*
- *IP Phone 2007 User Guide (NN43118-100)*
- *IP Phone Audio Conference Phone 2033 User Guide (NN43111-100)*
- *IP Phone 1120E User Guide (NN43112-103)*
- *IP Phone 1140E User Guide (NN43113-106)*
- *IP Phone 1150E User Guide (NN43114-100)*
- *IP Phone 1110 User Guide (NN43110-101)*
- *IP Softphone 2050 User Guide (NN43119-101)*
- *Mobile Voice Client 2050 User Guide (NN43119-103)*
- *IP Phone Key Expansion Module User Guide*
- *Expansion Module for IP Phones 1100 Series User Guide (NN43130-101)*
- *WLAN IP Telephony Installation and Commissioning (NN43001-504)*
- *Converging the Data Network with VoIP Fundamentals (NN43001-260)*
- *Signaling Server Installation and Commissioning (NN43001-312)*
- *IP Peer Networking Installation and Commissioning (NN43001-313)*
- *Security Management Fundamentals (NN43001-604)*
- *Features and Services Fundamentals—Book 4 of 6 (NN43001-106)*
- *Central Answering Position Implementation Guide (NN43011-501)*
- *IP Line Fundamentals (NN43100-500)*
- *Software Input Output Administration (NN43001-611)*
- *Secure Multimedia Controller Implementation Guide (NN43001-325)*

Online

To access Nortel documentation online, click the **Technical Documentation** link under **Support** on the Nortel home page:

www.nortel.com

CD-ROM

To obtain Nortel documentation on CD-ROM, contact your Nortel customer representative.

Nortel IP Phone 2001

Contents

This section contains the following topics:

- "Introduction" (page 31)
- "Description" (page 32)
- "Components and functions" (page 33)
- "Supported features" (page 34)
- "Features not supported" (page 36)
- "Display characteristics" (page 36)
- "Key number assignments" (page 38)
- "Package components" (page 38)
- "Installation and Configuration" (page 40)
- "Full Duplex mode" (page 57)
- "Gratuitous Address Resolution Protocol Protection " (page 59)
- "Extensible Authentication Protocol " (page 59)
- "Redeploying an IP Phone 2001" (page 59)
- "Replacing an IP Phone 2001" (page 60)
- "Removing an IP Phone 2001 from service" (page 61)

Introduction

This section explains how to install and maintain the IP Phone 2001. For information about using the IP Phone 2001, see the *IP Phone 2001 User Guide (NN43115-102)*.

This section contains the following procedures:

- Procedure 1 "Configuring the IP Phone 2001" (page 41)
- Procedure 2 "Installing the IP Phone 2001 for the first time using manual configuration" (page 44)

- Procedure 3 "Installing an IP Phone 2001 for the first time using DHCP" (page 51)
- Procedure 4 "Enabling Full Duplex mode" (page 58)
- Procedure 5 "Checking Ethernet Statistics" (page 58)
- Procedure 6 "Changing the TN of an existing IP Phone 2001" (page 59)
- Procedure 7 "Replacing an IP Phone 2001" (page 60)
- Procedure 8 "Removing an IP Phone 2001 from service" (page 61)

After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Phone 2001 uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 2001 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 2001 network connection, and Communication Server 1000 connection.

Figure 1 "IP Phone 2001" (page 32) shows the IP Phone 2001.

Figure 1
IP Phone 2001



Components and functions

This section describes the following components and functions of the IP Phone 2001:

- keys and functions
- Services menu

Keys and functions

Table 2 "IP Phone 2001 keys and functions" (page 33) describes the IP Phone 2001 keys and functions.

Table 2
IP Phone 2001 keys and functions

Key	Function
Speaker	Press the Line key to activate the speaker for on-hook dialing and listening.
Message waiting/ Incoming call indicator	The Message waiting lamp turns on to indicate that a message is left for the user. This lamp also flashes when the IP Phone ringer is on.
Volume control bar	Use the volume control bar to adjust the volume of the Handset, Ringer, and On-hook Dialing/Listen tones. Press the right side of the rocker bar to increase volume; press the left side to decrease volume.
Navigation keys	Use the navigation keys to scroll through menus and lists in the display area.
Line key	Use the Line key to access the single line and activate on-hook dialing. No status icon or LED is provided.
Hold key	Press the Hold key to put an active call on hold. Press the Dial/Line key to return to the caller on hold.
Context-sensitive soft keys (self-labeled)	Context-sensitive soft keys (self-labeled) are located below the display area. The LCD label above the key changes, based on the active feature. A triangle before a key label indicates that the key is active.
Message key	Press the Message key to access your voice mailbox.
Goodbye key	Press the Goodbye key to terminate an active call.

Services menu

Table 3 "Services menu" (page 34) shows the Services menu.

Table 3
Services menu

Services key	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume adjustment — Contrast adjustment — Language — Date/Time — Local DialPad Tone — Set Info — Diagnostics — Ring type — Call Timer — Live Dialpad • Password Admin <ul style="list-style-type: none"> — Station Control Password • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured) <p>Press the Services key to exit from any menu or menu item.</p> <p>Double-press the Services key to access Network diagnostic utilities. For more information about Network diagnostic utilities, see Appendix "IP Phone diagnostic utilities" (page 465).</p>
<p>If a call is presented while the user is manipulating information, the phone rings. However, the display is not updated with the Caller ID, and the programming text is not disturbed.</p> <p>The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or Caller ID, and Autodial and Last Number Redial intercept the dialpad.</p>	

Supported features

The IP Phone 2001 supports the following telephony features:

- four context-sensitive soft keys that provide access to a maximum of nine features

Functions for the context-sensitive soft keys are configured in LD 11.

- volume control bar to adjust ringer, speaker, handset, and headset volume
- two specialized feature keys
 - Message/Inbox
 - Services
- two call-processing keys
 - Goodbye
 - Hold
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 2001 supports the following data network features:

- 10/100 Mb/s Full Duplex mode
- automatic network configuration through DHCP.

For more information about automatic network configuration, see [Table 5 "IP Phone 2001 IP parameters" \(page 43\)](#).

- 802.1ab Link Layer Discovery Protocol (LLDP)

For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).

- Secure Real-time Transport Protocol (SRTP) media encryption.

For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).

- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use. VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*
- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN

For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 2
- Gratuitous Address Resolution Protocol (GARP) Protection

The IP Phone 2001 supports the following languages: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana.

Features not supported

The following features are not supported on the IP Phone 2001:

- External three-port switch to support sharing LAN access with a PC or other data device is not provided. However, the IP Phone 2001 does provide 100 Mb/s full-duplex support.
- Integrated switch
- Personal Directory, Callers List, and Redial List are not supported. However, if the primary DN on an IP Phone 2001 is an MADN of an IP Phone 2002, IP Phone 2004, or IP Softphone 2050, Preferred Name Match and Idle Set Display (new call indication) are supported.
- Corporate Directory
- Automatic Call Distribution
- IP Key Expansion Modules
- Support of accessory modules
- Group Listening
- Set-to-Set messaging
- Handsfree operation
- Headset support

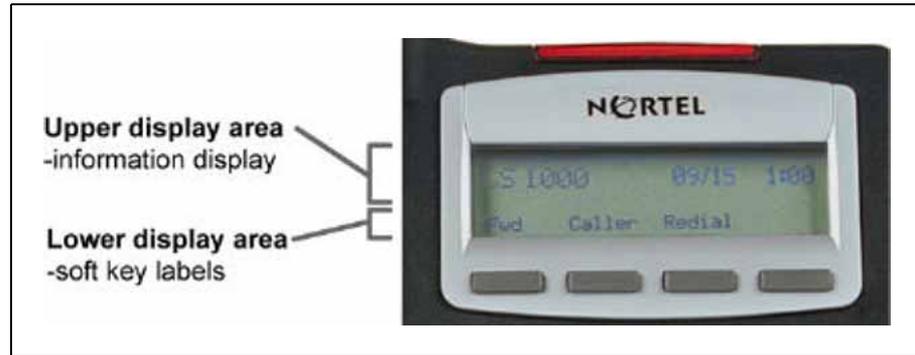
Display characteristics

An IP Phone 2001 has two display areas:

- information line display
- soft key label display

[Figure 2 "IP Phone 2001 display areas" \(page 37\)](#) shows these two display areas.

Figure 2
IP Phone 2001 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone 2001. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Information Line display

An IP Phone 2001 has a one-line information display area with the following information:

- caller Number
- caller Name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state) or Call Timer (if provisioned in the Telephone options menu)
- set information

The information area changes according to the call-processing state and active features.

Soft key label display

The soft key label has a maximum six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon appears at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns

to On. The icon remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, and returns the soft key label to its original state.

Use the More soft key to navigate the layers of functions. If only four functions are assigned to the soft keys, the More key does not appear, and all four functions are displayed.

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined soft keys. Because the soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four soft keys. Labels for the soft keys appear in the display area. For further information, see ["Soft key label display" \(page 37\)](#). [Figure 2 "IP Phone 2001 display areas" \(page 37\)](#) shows the IP Phone 2001 display area.

Key number assignments at the Call Server align with the IP Phone 2002. The mappings between IP Phone 2001 soft key numbers and PBX CPU key numbers are the same as on the IP Phone 2002 and IP Phone 2004.

For a description of the IP Phone function assignment for each soft key, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#)

Package components

The following information applies to Phase II IP Phones. Product codes for Phase II IP Phones are different from previous IP Phones.

See the product code on the back of the phone to confirm whether it is a Phase II IP Phone. The product code for Phase II IP Phones appears as IP Phone 200x. The product code for previous versions of the IP Phones appears with an i in front of the model number (for example, i200x).

You must order the AC power adapter separately if local power using the AC adapter is required, because Phase II IP Phones include integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

Table 4 "IP Phone 2001 components list" (page 39) lists the IP Phone 2001 package components and product codes.

Table 4
IP Phone 2001 components list

IP Phone 2001 package contents include	
<ul style="list-style-type: none"> • IP Phone 2001 • handset • handset cord • footstand • 7-ft. Cat5 Ethernet cable • Getting Started card 	
IP Phone 2001 (Ethergray) with Icon keycaps	NTDU90AA16/A0533387
IP Phone 2001 (Ethergray) with English text label keycaps	NTDU90BA16/A0533388
IP Phone 2001 (Charcoal) with Icon keycaps	NTDU90AA70/A0053389
IP Phone 2001 (Charcoal) with English text label keycaps	NTDU90BA70/A0533390
IP Phone 2001 (Charcoal with Bezel) with Icon keycaps	NTDU90AB70
IP Phone 2001 (Charcoal with Bezel) with Icon keycaps (RoHS)	NTDU90AC70E6
IP Phone 2001 (Charcoal with Bezel) with English text label keycaps	NTDU90BB70
IP Phone 2001 (Charcoal with Bezel) with English text label keycaps (RoHS)	NTDU90BC70E6
Replacement parts	
7-ft. Cat5 Ethernet Cable	A0648375
Handset, Ethergray	A0788874
Handset, Charcoal	A0758634
Handset cord, Ethergray; for IP Phone 2004 and IP Phone 2001	A088682
Handset cord, Charcoal; for IP Phone 2004 and IP Phone 2001	N0000764
IP Phone 2001/2002/2004 Power Adapters	
Power transformer (117/120 VAC 50/60 Hz) (North America)	A0619627
Power transformer 3-prong AC to AC, direct plug-in, 8 W, 240 VAC, 50 Hz to 16 VAC at 500 mA (Ireland and UK)	A0656598
Power transformer AC to AC, direct plug-in, 8 W, 230 VAC, 50/60 Hz, to 16 VAC at 500 mA (Europe)	A0619635

Power transformer 2-prong wall plug direct plug-in AC to AC, 8 W, 240 VAC, 50 Hz, to 16 VAC at 500 mA (Australia and New Zealand)	A0647042
Power transformer AC to AC, direct plug-in, 8 W, 100 VAC, 50 Hz, to 16 VAC at 500 mA	A0828858

For more information, and for information about previous versions of the IP Phone, contact your Nortel representative.

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 2001:

- Before you begin
- First-time installation
- Configuring the IP Phone 2001
- Startup sequence
- Installing the IP Phone 2001

Before you begin

Before installing the IP Phone 2001, complete the following pre-installation checklist:

- Ensure one IP Phone 2001 boxed package exists for each IP Phone 2001 being installed. The package contains:
 - IP Phone 2001
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - Getting Started Card
- Ensure 1 Software License exists 1 for each IP Phone 2001 being installed.
- Ensure the host Call Server is equipped with a Signaling Server that runs the Line Terminal Proxy Server (LTPS) application.
- If an AC power adapter is required, ensure you use the correct AC power transformer. The voltage rating of the transformer must match the wall outlet voltage. See [Table 4 "IP Phone 2001 components list" \(page 39\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* and *IP Line Fundamentals (NN43100-500)*.



CAUTION

Do not plug your IP Phone 2001 into an ISDN connection. Severe damage can result.

Configuring the IP Phone 2001

Use [Procedure 1 "Configuring the IP Phone 2001" \(page 41\)](#) to configure the IP Phone 2001 for the first time.

Procedure 1

Configuring the IP Phone 2001

Step	Action
------	--------

- | | |
|---|---|
| 1 | <p>Configure a virtual loop on the Call Server using LD 97.</p> <p>For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i>, and <i>Software Input Output Administration (NN43001-611)</i>.</p> |
| 2 | <p>Configure the IP Phone 2001 on the Call Server using LD 11. At the prompt, enter the following:</p> <pre>REQ:chg TYPE:2001P2</pre> <p>For more information about configuring the IP Phone 2001 using LD 11, see <i>Software Input Output Administration (NN43001-611)</i></p> |
| 3 | <p>Connect the IP Phone 2001 components:</p> <ol style="list-style-type: none"> Connect one end of the handset cord to the handset jack on the back of the IP Phone identified with a handset icon. Connect the other end of the handset cord to the handset. |
| 4 | <p>Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see Figure 3 "IP Phone 2001 Ethernet network interface connections" (page 42)). The other end of the CAT5 Ethernet cable plugs into the IP network.</p> |
| 5 | <p>Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC</p> |

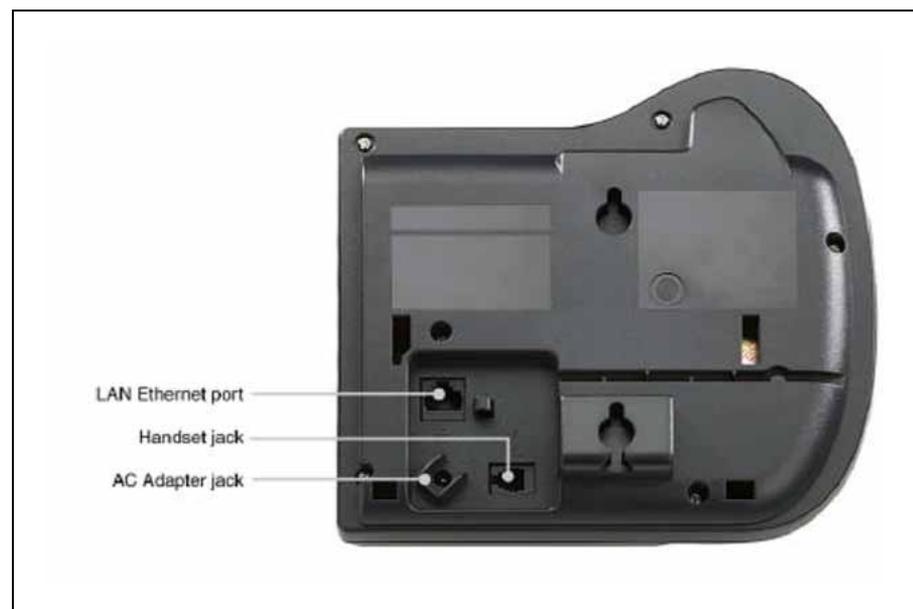
adapter jack in the bottom of the phone. Form a small bend in the cable and then thread the adapter cord through the channels in the stand.

- 6 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.

**CAUTION****Damage to Equipment**

Do not plug any device into your IP Phone 2001 Ethernet port other than one PC.

Figure 3
IP Phone 2001 Ethernet network interface connections



- 7 Power the IP Phone 2001 using either the Power over Ethernet or an AC power transformer (local power). If you are using local power, plug the AC power transformer into the nearest power outlet. Make sure you use the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. See [Table 4 "IP Phone 2001 components list" \(page 39\)](#).

The IP Phone 2001 supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 2. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

- 8 Use [Procedure 2 "Installing the IP Phone 2001 for the first time using manual configuration" \(page 44\)](#) to install the IP Phone 2001 for the first time using manual configuration, or use [Procedure 3 "Installing an IP Phone 2001 for the first time using DHCP" \(page 51\)](#) to install the IP Phone 2001 for the first time using DHCP.

—End—

Startup sequence

When an IP Phone 2001 connects to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 5 "IP Phone 2001 IP parameters" \(page 43\)](#) for a summary of the IP parameters and how they are obtained.

Table 5
IP Phone 2001 IP parameters

Parameter	Method of Acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Installing the IP Phone 2001

To install the IP Phone 2001 for the first time using manual configuration, use [Procedure 2 "Installing the IP Phone 2001 for the first time using manual configuration"](#) (page 44). To install the IP Phone 2001 for the first time using DHCP, use [Procedure 3 "Installing an IP Phone 2001 for the first time using DHCP"](#) (page 51).

ATTENTION

Timing information

There are only four seconds between plugging in the IP Phone 2001 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 2001 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities"](#) (page 465).

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 2

Installing the IP Phone 2001 for the first time using manual configuration

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select 0-No (0 for No), you are not prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451).

- 4 At the prompt, **LLDP Enable?**, enter 1-Y (1 for Yes, default) to enable the ability to control 802.1Q and 802.1p bits.

For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#). For more information about 802.1Q, see [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 5 At the prompt **DHCP Yes/No?**, enter 0-N (0 for No). You are prompted to enter all parameters.

By default, Full DHCP is configured on the IP Phone 2001. Depending on the configuration requirements, you can change the IP Phone 2001 configuration to allow the following IP address assignments:

- Static—enter all parameters
- Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server
- Full DHCP— (default) all parameters are obtained from the DHCP server

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration. For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 6 Enter the following information:

Screen prompt	Description
set IP	A valid IP Phone 2001 IP address.
net msk	A subnet mask.
def gw	The default Gateway for the IP Phone 2001 on the LAN segment to which the IP Phone 2001 connects.

- 7 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

S1 IP	The primary CS 1000 node IP address for the IP Phone 2001.
S1 Port	This is a fixed value: 4100

S1 action	<p>Choose one of the following:</p> <ul style="list-style-type: none">• for TPS only, enter 1• for TPS and Secure Media Controller, enter 6 or 1 <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	<p>The number of times the IP Phone 2001 attempts to connect to the server. Enter 10.</p>
S1 PK	<p>Default is ffffffffffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, choose one of the following:</p> <ul style="list-style-type: none">• Set S1 PK to 6 or 1.• Enter a 16-digit hexadecimal number.
S2 IP	<p>The secondary CS 1000 node IP address for the IP Phone 2001.</p>
S2 Port	<p>Same as S1.</p>
S2 action	<p>Same as S1</p> <p>You are not prompted for S2 PK if S2 Action is set to 1.</p>
S2 retry count	<p>Same as S1.</p>

S2 PK	<p>Default is ffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	<p>Default 0 (for No).</p> <p>If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.</p>
XAS IP:	<p>Enter the IP address of the XAS server.</p>
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>
802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Data VLAN? (0-N, 1-Y)	<p>Default 0 (for No). VLAN settings on the PC port of the IP Phone 2001 is used for the initial DHCP discovery and not for PC traffic, because the IP Phone 2001 does not have a PC port.</p>

Voice VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.
VLAN Cfg? 0-Auto, 1-Man:	Default 0 (for Auto). You are not prompted for VLAN Cfg if Voice VLAN is not enabled. 0-Auto Automatically obtains VLAN ID using DHCP or the 802.1ab data switch. 1-Man Enter the VLAN ID manually. This is a number from 1 to 4094.
LLDP-MED? (0-No, 1-Yes)	If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV. You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.
LLDP VLAN? (0-No, 1-Yes)	If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV. You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.
DHCP (0-No, 1-Yes)	If you select 1-Y (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server. You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.
VLANFILTER (0-N, 1-Y)	Default 0 (for No). You are not prompted for VLANFILTER if VLAN is not enabled.

Ctrl pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Ctrl pBits if 802.1Q is not enabled.
Media pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Media pBits if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0 for No, 1 for Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 2001 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2001 searches for the TFTP Server for firmware upgrade. If the file name specified in i2001.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2001 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2001 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2001 saves the configuration and then reboots. The IP Phone 2001 searches for the connect server.

8 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password. You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

The IP Phone 2001 registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2001 resets.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

9 Check for a dial tone and the correct DN above the display.**10** (Optional) Customize the feature keys as required. For more information, see *IP Phone 2001 User Guide (NN43115-102)*.

—End—

ATTENTION**Timing information**

There are only four seconds between plugging in the IP Phone 2001 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 2001 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- erase a configuration entry to change it
- Clear—clear an entire configuration entry

- **Cancel**—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 3

Installing an IP Phone 2001 for the first time using DHCP

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select 0-No (0 for No), you are not prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451) .
4	At the prompt, LLDP Enable? , enter 1-Y (1 for Yes, default). For more information about LLDP, see Appendix "802.1ab Link Layer Discovery Protocol" (page 453) . For more information about 802.1Q, see Appendix "802.1Q VLAN description" (page 443) .
5	At the prompt DHCP Yes/No? , select 1-Y (1 for Yes). By default, Full DHCP is configured on the IP Phone 2001. Depending on the configuration requirements, you can change the IP Phone 2001 configuration to allow the following IP address assignments: <ul style="list-style-type: none"> • Static—enter all parameters • Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server • Full DHCP— (default) all parameters are obtained from the DHCP server A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration. For more information about how to set up DHCP servers for use with the IP Phones, see <i>Converging the Data Network with VoIP Fundamentals (NN43001-260)</i> .
6	At the prompt, Cached IP? , select 0 (0-No, default) to conform to the DHCP standard and to obtain an IP address from the DHCP server. Only select 1 (1 for Yes) to force the IP Phone to start with

a cached IP address if the IP Phone cannot connect to the DHCP server and obtain an IP address.

7 Select Partial or Full DHCP.

- a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
- a valid IP Phone 2001 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 2001 on the LAN segment to which it connects
 - the S1 IP (the primary CS 1000 node IP address of the IP Phone)
 - the S1 action
 - the S1 retry count (this is the number of times the IP Phone 2001 attempts to connect to the server)
 - the S2 IP (the secondary CS 1000 node IP address of the IP Phone)
 - the S2 action
 - the S2 retry count
- b. If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 2001.
S1 Port	This is a fixed value: 4100
S1 action	Choose one of the following: <ul style="list-style-type: none"> • for TPS only, enter 1 • for TPS and Secure Media Controller, enter 6 or 1 <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if the S1 action is set to 1.</p>

Screen prompt	Description
S1 retry count	The number of times the IP Phone 2001 attempts to connect to the server. Enter 10.
S1 PK	Default is ffffffff. The Private key of the Secure Media Controller which the IP Phone connects. If you are using a Secure Media Controller, do the following: <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
S2 IP	The secondary CS 1000 node IP address for the IP Phone 2001.
S2 Port	Same as S1.
S2 action	Same as S1. You are not prompted for S2 PK if the S2 action is set to 1.
S2 retry count	Same as S1.
S2 PK	Default is ffffffff. The Private key of the alternate Secure Media Controller to which the IP Phone connects. If you are using a Secure Media Controller, do the following: <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	Default 0 (for No). If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.
XAS IP:	Enter the IP address of the XAS server.

Screen prompt	Description
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for off or if Speed is set to 0 for Auto.</p>

8 Enter the following parameters:

802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Data VLAN? (0-N, 1-Y)	<p>Default 0 (for No). VLAN settings on the PC port of the IP Phone 2001 is used for the initial DHCP discovery and not for PC traffic, because the IP Phone 2001 does not have a PC port.</p>
Voice VLAN (0-N, 1-Y)	<p>Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.</p>
VLAN Cfg? (0-Auto, 1-Man)	<p>Default 0 (for Auto). 0-Auto Automatically obtains VLAN ID using DHCP, or the 802.1ab data switch. 1-Man Enter the VLAN ID manually. This is a number from 1 to 4094. You are not prompted for VLAN Cfg if Voice VLAN is not enabled.</p>

LLDP-MED? (0-N, 1-Y)	<p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV.</p>
LLDP VLAN? (0-No, 1-Yes)	<p>You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p> <p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.</p>
DHCP (0-No, 1-Yes)	<p>You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.</p> <p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.</p>
VLANFILTER (0-No, 1-Yes)	<p>You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.</p> <p>Default 0 (0 for No).</p> <p>You are not prompted for VLANFILTER if VLAN is not enabled.</p>
Duplex? (0-Auto, 1-Full)	Default 0 (for Auto).
Ctrl pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Ctrl pBits if 802.1Q is not enabled.</p>
Media pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Media pBits if 802.1Q is not enabled.</p>
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).

PSK SRTP? (0 for No, 1 for Yes) Default 0 (for No).
GARP Ignore? (0-No,1-Yes) Default 0 (for No).

The IP Phone 2001 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt.
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2001 searches for the TFTP Server for firmware upgrade. If the file name specified in i2001.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2001 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2001 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2001 saves the configuration and then reboots. The IP Phone 2001 searches for the connect server.

9 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password. You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

The IP Phone 2001 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2001 resets.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

10 Check for a dial tone and the correct DN above the display.**11** (Optional) Customize the feature keys as required. For more information, see *IP Phone 2001 User Guide (NN43115-102)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing the duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 4 "Enabling Full Duplex mode" \(page 58\)](#) to enable Full Duplex mode.

Procedure 4
Enabling Full Duplex mode

Step	Action
1	Reset the phone by disconnecting and reconnecting power.
2	When the Nortel logo appears, press each soft key in sequence. See Procedure 3 "Installing an IP Phone 2001 for the first time using DHCP" (page 51) .
3	If no other configuration changes are required, press OK repeatedly until the Duplex network option appears.
4	Select 1 to enable Full Duplex mode.
5	When the Speed option appears, select one of the following: <ul style="list-style-type: none"> • 0 for 10 Mb/s • 1 for 100 Mb/s (default)
6	Select OK to confirm the change.
7	Restart the IP Phone 2001. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 5 "Checking Ethernet Statistics" \(page 58\)](#) to confirm activation of Full Duplex mode.

Procedure 5
Checking Ethernet Statistics

Step	Action
1	Double-click the Services key. The Network Diagnostics menu appears.
2	Select Ethernet Statistics . <ul style="list-style-type: none"> • If Full Duplex mode is active, the following is displayed:

- Link: UP
- Duplex: Full
- Speed: 10 (Mb) or 100(Mb)
- Auto-Negotiate Capability: N
- Auto-Negotiate Completed: N

—End—

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection prevents the IP Phone 2001 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. The malicious device launches a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 2 "Installing the IP Phone 2001 for the first time using manual configuration" \(page 44\)](#) or [Procedure 3 "Installing an IP Phone 2001 for the first time using DHCP" \(page 51\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Redeploying an IP Phone 2001

You can redeploy an existing previously configured IP Phone 2001 on the same system. For example, the IP Phone 2001 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2001. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 6

Changing the TN of an existing IP Phone 2001

Step	Action
------	--------

- | | |
|---|----------------------------|
| 1 | Repower the IP Phone 2001. |
|---|----------------------------|

During the reboot sequence of a previously configured IP Phone, the IP Phone 2001 displays the existing node number for approximately five seconds.

- 2 If the node password is enabled and NULL, choose one of the following:
 - a. Disable the password.
 - b. Set the password as non-NULL.
- 3 Press **OK** when the node number displays.

If	Then
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .
the node password is disabled	a TN screen displays. Go to Step 5 .

- 4 Enter password at the password screen, and press **OK**.
A TN screen displays.
To obtain the password, enter the `nodePwdShow` command in Element Manager. For further information, see *Element Manager System Reference—Administration (NN43001-632)*.
- 5 Select the **Clear** soft key to clear the existing TN.
- 6 Enter the new TN.

—End—

Replacing an IP Phone 2001

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 2001 that currently uses the TN.

Procedure 7 Replacing an IP Phone 2001

Step	Action
------	--------

- | | |
|---|--|
| 1 | Obtain the node and TN information of the phone you want to replace. |
| 2 | Disconnect the IP Phone 2001 that you want to replace. |

- 3 Follow Procedure 1 "Configuring the IP Phone 2001" (page 41) and Procedure 2 "Installing the IP Phone 2001 for the first time using manual configuration" (page 44) or Procedure 3 "Installing an IP Phone 2001 for the first time using DHCP" (page 51) to install and configure the IP Phone 2001.
- 4 Enter the same TN and Node Number as the IP Phone 2001 you replaced. The system associates the new IP Phone 2001 with the existing TN.

—End—

Removing an IP Phone 2001 from service

Procedure 8

Removing an IP Phone 2001 from service

Step	Action
------	--------

- 1 Disconnect the IP Phone 2001 from the network or turn off the power.
If the IP Phone 2001 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.
- 2 In LD 11, enter OUT at the TN prompt.

—End—

Nortel IP Phone 2002

Contents

This section contains the following topics:

- "Introduction" (page 63)
- "Description" (page 64)
- "Components and functions" (page 65)
- "Supported features" (page 68)
- "Features not currently supported" (page 70)
- "Display characteristics" (page 70)
- "Key number assignments" (page 72)
- "Package components" (page 73)
- "Installation and Configuration" (page 74)
- "Full Duplex mode" (page 93)
- "Gratuitous Address Resolution Protocol Protection" (page 94)
- "Extensible Authentication Protocol " (page 95)
- "Redeploying an IP Phone 2002" (page 95)
- "Replacing an IP Phone 2002" (page 96)
- "Removing an IP Phone 2002 from service" (page 96)

Introduction

This section explains how to install and maintain the IP Phone 2002. For information about using the IP Phone 2002, see the *IP Phone 2002 User Guide (NN43116-104)*.

This section contains the following procedures:

- Procedure 9 "Configuring the IP Phone 2002" (page 75).
- Procedure 10 "Installing the IP Phone 2002 for the first time using manual configuration" (page 79).

- Procedure 11 "Installing an IP Phone 2002 for the first time using DHCP" (page 85).
- Procedure 12 "Enabling Full Duplex mode" (page 93).
- Procedure 13 "Checking Ethernet Statistics" (page 94).
- Procedure 14 "Changing the TN of an existing IP Phone 2002" (page 95).
- Procedure 15 "Replacing an IP Phone 2002" (page 96).
- Procedure 16 "Removing an IP Phone 2002 from service" (page 96).

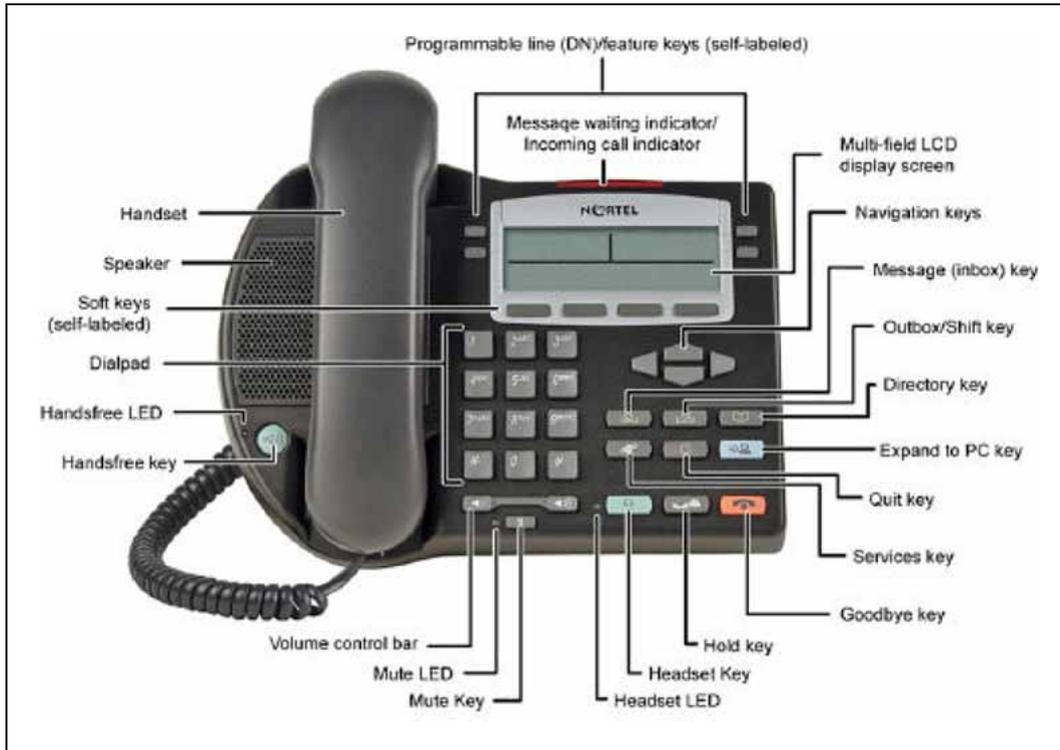
After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Phone 2002 uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 2002 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 2002 network connection, and Communication Server 1000 connection.

Figure 4 "IP Phone 2002" (page 65) shows the IP Phone 2002.

Figure 4
IP Phone 2002



Components and functions

This section describes the following components and functions of the IP Phone 2002:

- keys and functions
- Services menu

Keys and functions

Table 6 "IP Phone 2002 keys and functions" (page 65) describes the IP Phone 2002 keys and functions.

Table 6
IP Phone 2002 keys and functions

Key	Function
Speaker	Press the Line key to activate the speaker for on-hook dialing and listening.

Key	Function
Programmable line (DN)/feature keys (self-labeled)	<p>Programmable line (DN)/feature keys (self-labeled) are configured for various features on the IP Phone. One must be the prime DN key.</p> <p>A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.</p>
Message waiting light/ Incoming call indicator	The Message waiting light turns ON to indicate that a message has been left for the user. This light also flashes when the set ringer is ON.
Context-sensitive soft keys (self-labeled)	<p>Context-sensitive soft keys (self-labeled) are located below the display area. The LCD label above the key changes, based on the active feature.</p> <p>A triangle before a key label indicates that the key is active.</p>
Navigation keys	Use the navigation keys to scroll through menus and lists in the display area.
Message (Inbox)	Press the Message (Inbox) key to access your voice mailbox.
Outbox/Shift	The Outbox/Shift key is a fixed key that is reserved for future feature development.
Directory	Press the Directory key to access Directory services.
Quit	<p>Press the Quit key to end an active application.</p> <p>Pressing the Quit key does not affect the status of the calls currently on your IP Phone.</p>
Expand to PC	The Expand to PC key is used to access external server applications such as External Application Server (XAS).
Goodbye	Press the Goodbye key to terminate an active call.
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Headset	Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.
Mute	<p>Press the Mute key to listen to the receiving party without transmitting.</p> <p>Press the Mute key again to return to a two-way conversation.</p> <p>The Mute key applies to Handsfree, Handset, and Headset microphones.</p> <p>The Mute LED flashes when the Mute option is in use.</p>

Key	Function
Volume control bar	Use the volume control bar to adjust the volume of the handset, headset, speaker, ringer, and, Handsfree feature.
	Press the right side of the rocker bar to increase volume; press the left side to decrease volume.
Handsfree key	Press the Handsfree key to activate the Handsfree feature.
	The LED lights to indicate when handsfree is active.

Services menu

Table 7 "Services menu" (page 67) shows the Services menu.

Table 7
Services menu

Services key	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language — Date/Time Format — Display diagnostics — Local Dialpad Tone — Set Info — Ring type — OnHook Default Path — Change Feature key label — Call Timer — Live Dialpad • Password Administration • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)
--------------	--

	<ul style="list-style-type: none">• Test Local Mode and Resume Local Mode (if Branch Office is configured)
Double-press the Services key to access Network diagnostic utilities. For more information about Network diagnostic utilities, see Appendix "IP Phone diagnostic utilities" (page 465) .	
If a call is presented while the user is manipulating an option, the IP Phone 2002 rings and the DN key flashes. However, the display is not updated with the Caller ID, and the programming text is not disturbed.	
The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID information, and Autodial and Last Number Redial intercept the dialpad.	

Supported features

The IP Phone 2002 supports the following telephony features:

- four programmable line (DN)/ feature keys (self-labeled)
- four context-sensitive soft keys (self-labeled) that provide access to a maximum of nine features

Functions for the context-sensitive soft keys are configured in LD 11.

- volume control bar to adjust ringer, speaker, handset, and headset volume
- six specialized feature keys
 - Quit
 - Directory
 - Message/Inbox
 - Shift/Outbox
 - Services
 - Copy
- six call-processing fixed keys:
 - Mute
 - Handsfree
 - Goodbye
 - Expand to PC
 - Headset
 - Hold
- Call Duration Timer
- ability to change the programmable line (DN)/feature key labels

- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 2002 supports the following data network features:

- integrated switch for shared PC access
 - the LAN Ethernet port supports 10/100BT Mb/s Full Duplex mode
 - the PC Ethernet port supports 10/100BT Mb/s Full Duplex mode
- automatic network configuration through DHCP

For more information about automatic network configuration, see [Table 9 "IP Phone 2002 IP parameters" \(page 78\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP)

For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption

For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).
- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone; allows VLAN and priority tagging for the IP Phone traffic and VLAN tagging for PC traffic
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN

For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 2
- Gratuitous Address Resolution Protocol Protection (GARP)

The IP Phone 2002 supports the following user interface features:

- External Application Server (XAS)
- language support: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana
- IP Key Expansion modules

Features not currently supported

The following features are not supported on the IP Phone 2002:

- Group Listening
- Set-to-Set messaging

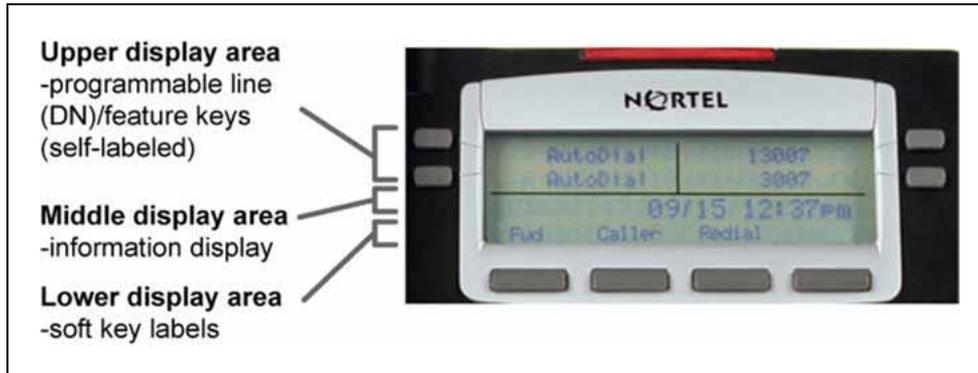
Display characteristics

An IP Phone 2002 has three major display areas:

- programmable line (DN)/feature key label
- information line
- soft key label

[Figure 5 "IP Phone 2002 display areas" \(page 71\)](#) shows these three display areas.

Figure 5
IP Phone 2002 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Programmable line (DN)/feature key label display

The feature key label area displays a 10-character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. A telephone icon displays the status of the configured DN. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

If a label is longer than 10 characters, the last 10 characters are displayed and the excess characters are deleted from the beginning of the string.

Information line display

An IP Phone 2002 has a one-line information display area with the following information:

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state) or Call Timer (if provisioned in the Telephone options menu)

The information in the display area changes, according to the call-processing state and active features.

Because the IP Phone 2002 only has a one-line information display area, you are prompted to scroll through any additional lines of information.

During an incoming call, only the Directory Number (DN) displays if the caller name is greater than 10 characters. Press the flashing arrow to display the caller name.

Soft key label display

The soft key label has a maximum six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon appears at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. The icon remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, and returns the soft key label to its original state.

Use the More soft key to navigate the layers of functions. If only four functions are assigned to the soft keys, the More key does not appear, and all four functions are displayed.

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined soft keys. Because the soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the soft keys in layers in LD 11.

The Message key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four soft keys. Labels for the soft keys appear in the display area. For further information, see ["Soft key label display" \(page 72\)](#). [Figure 5 "IP Phone 2002 display areas" \(page 71\)](#) shows the IP Phone 2002 display area.

Key number assignments at the Call Server align with IP Phone 2004. The mappings between IP Phone 2002 soft key numbers and PBX CPU key numbers are the same as on the IP Phone 2004.

For a description of the IP Phone function assignment for each soft key, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The following information applies to Phase II IP Phones. Product codes for Phase II IP Phones are different from previous sets.

See the product code on the back of the phone to confirm whether it is a Phase II IP Phone. The product code for Phase II IP Phones appears as IP Phone 200x. The product code for previous versions of the IP Phone appears with an i in front of the model number (for example, i200x).

You must order the AC power adapter separately if local power using the AC adapter is required, because Phase II IP Phones include integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

[Table 8 "IP Phone 2002 components list" \(page 73\)](#) lists the IP Phone 2002 package components and product codes.

Table 8
IP Phone 2002 components list

IP Phone 2002 package contents include	
<ul style="list-style-type: none"> • IP Phone 2002 • Handset • Handset cord • Footstand • 7ft Cat5 Ethernet cable • Getting Started card 	
IP Phone 2002 (Ethergray) with Icon keycaps	NTDU91AA16/A0533404
IP Phone 2002 (Ethergray) with English text label keycaps	NTDU91BA16/A0533405
IP Phone 2002 (Charcoal) with Icon keycaps	NTDU91AA70/A0533406
IP Phone 2002 (Charcoal) with English text label keycaps	NTDU91BA70/A0533407
IP Phone 2002 (Charcoal with Bezel) with Icon keycaps	NTDU91AB70
IP Phone 2002 (Charcoal with Bezel) with Icon keycaps (RoHS)	NTDU91AC70E6
IP Phone 2002 (Charcoal with Bezel) with English text label keycaps	NTDU91BB70
IP Phone 2002 (Charcoal with Bezel) with English text label keycaps (RoHS)	NTDU91BC70E6
Replacement parts	
7-ft. Cat5 Ethernet cable	A0648375
Handset, Ethergray	A0788874

Handset, Charcoal	A0758634
Handset cord, Ethergray	A0897725
Handset cord, Charcoal	N0000763
Footstand, Charcoal (used for Ethergray and Charcoal models)	A0891619
IP Phone 2001/2002/2004 Power Adaptors	
Power transformer (117/120 VAC 50/60 Hz) (North America)	A0619627
Power transformer 3-prong AC to AC, direct plug-in, 8 W, 240 VAC, 50 Hz to 16 VAC at 500 mA (Ireland and UK)	A0656598
Power transformer AC to AC, direct plug-in, 8 W, 230 VAC, 50/60 Hz, to 16 VAC at 500 mA (Europe)	A0619635
Power transformer 2-prong wall plug direct plug-in AC to AC, 8 W, 240 VAC, 50 Hz, to 16 VAC at 500 mA (Australia and New Zealand)	A0647042
Power transformer AC to AC, direct plug-in, 8 W, 100 VAC, 50 Hz, to 16 VAC at 500 mA	A0828858

For more information, and for information about previous versions of the IP Phone, contact Nortel.

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 2002:

- Before you begin
- First-time installation
- Configuring the IP Phone 2002
- Startup sequence
- Installing the IP Phone 2002

Before you begin

Before installing the IP Phone 2002, complete the following pre-installation checklist:

- Ensure one IP Phone 2002 boxed package exists for each IP Phone 2002 being installed. The package contains:
 - IP Phone 2002
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - Getting Started Card

- Ensure 1 Software License exists 1 for each IP Phone 2002 being installed.
- Ensure the host Call Server is equipped with a Signaling Server that runs the Line Terminal Proxy Server (LTPS) application.
- If an AC power adapter is required, ensure you use the correct AC power transformer. The voltage rating of the transformer must match the wall outlet voltage. See [Table 8 "IP Phone 2002 components list" \(page 73\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Do not plug your IP Phone 2002 into an ISDN connection. Severe damage can result.

Configuring the IP Phone 2002

Use [Procedure 9 "Configuring the IP Phone 2002" \(page 75\)](#) to configure the IP Phone 2002 for the first time.

Procedure 9

Configuring the IP Phone 2002

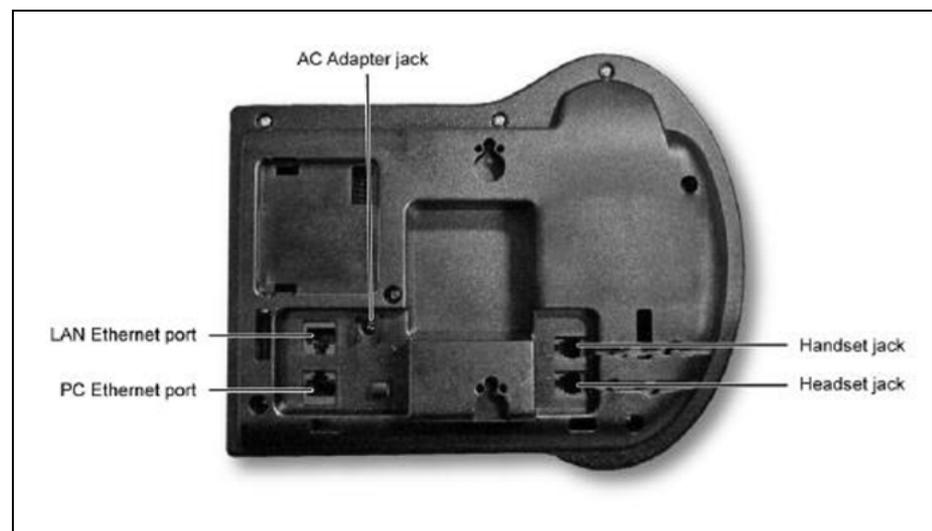
Step	Action
1	<p>Configure a virtual loop on the Call Server using LD 97.</p> <p>For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i>.</p>
2	<p>Configure the IP Phone 2002 on the Call Server using LD 11. At the prompt, enter the following:</p> <pre>REQ:chg TYPE:2002P1,2002P2</pre> <p>For more information about configuring the IP Phone 2002 using LD 11, see <i>Software Input Output Administration (NN43001-611)</i>.</p>
3	<p>Connect the IP Phone 2002 components:</p> <ol style="list-style-type: none"> Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).

- b. Connect the other end of the handset cord to the handset.
- 4 Choose one of the following connections:
- For an IP Phone not sharing LAN access with a PC:
Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see [Figure 6 "IP Phone 2002 Ethernet network interface connections" \(page 76\)](#)). The other end of the CAT5 Ethernet cable plugs into the IP network.
 - For an IP Phone sharing LAN access with a PC:
Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the IP Phone (identified with a LAN icon, see [Figure 6 "IP Phone 2002 Ethernet network interface connections" \(page 76\)](#)) and the other end to the IP network. Insert on end of a second CAT5 Ethernet cable into the PC network interface located on the back of the IP Phone (identified with a PC icon, see [Figure 6 "IP Phone 2002 Ethernet network interface connections" \(page 76\)](#)) and the other end into the computer.

**CAUTION****Damage to Equipment**

Do not plug any device into your IP Phone 2002 Ethernet port other than one PC. The IP Phone 2002 does not support multiple devices connected through the PC Ethernet port.

Figure 6
IP Phone 2002 Ethernet network interface connections



- 5 Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable and then thread the adapter cord through the channels in the stand.
- 6 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 7 Power the IP Phone 2002 using either the Power over Ethernet or an AC power transformer (local power). If you are using local power, plug the AC power transformer into the nearest power outlet. Make sure you use the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. See [Table 8 "IP Phone 2002 components list" \(page 73\)](#).

The IP Phone 2004 supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 2. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.
- 8 Use [Procedure 10 "Installing the IP Phone 2002 for the first time using manual configuration" \(page 79\)](#) to install the IP Phone 2002 for the first time using manual configuration, or use [Procedure 11 "Installing an IP Phone 2002 for the first time using DHCP" \(page 85\)](#) to install the IP Phone 2002 for the first time using DHCP.

—End—

Startup sequence

When an IP Phone 2002 connects to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 9 "IP Phone 2002 IP parameters" \(page 78\)](#) for a summary of the IP parameters and how they are obtained.

Table 9
IP Phone 2002 IP parameters

Parameter	Method of Acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Installing the IP Phone 2002

To install the IP Phone 2002 for the first time using manual configuration, use [Procedure 10 "Installing the IP Phone 2002 for the first time using manual configuration" \(page 79\)](#). To install the IP Phone 2002 for the first time using DHCP, see [Procedure 11 "Installing an IP Phone 2002 for the first time using DHCP" \(page 85\)](#).

ATTENTION

Timing information

There are only 4 second(s) between plugging in the IP Phone 2002 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 2002 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it

- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 10

Installing the IP Phone 2002 for the first time using manual configuration

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select No , you are not prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451) .
4	At the prompt, LLDP Enable? , enter 1-Y (1 for Yes, default). For more information about LLDP, see Appendix "802.1ab Link Layer Discovery Protocol" (page 453) . For more information about 802.1Q, see Appendix "802.1Q VLAN description" (page 443) .
5	At the prompt DHCP Yes/No? , enter 0-N (0 for No). By default, Full DHCP is configured on the IP Phone 2002. Depending on the configuration requirements, you can change the IP Phone 2002 configuration to allow the following IP address assignments: <ul style="list-style-type: none"> • Static—enter all parameters • Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server • Full DHCP— (default) all parameters are obtained from the DHCP server <p>A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration. For more information about how to set up DHCP servers for use with the IP Phones, see <i>Converging the Data Network with VoIP Fundamentals (NN43001-260)</i>.</p>

6 Enter the following information:

Screen prompt	Description
set IP	A valid IP Phone 2002 IP address.
net msk	A subnet mask.
def gw	The default Gateway for the IP Phone 2002 on the LAN segment to which it connects.

7 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 2002.
S1 Port	This is a fixed value: 4100
S1 action	Choose one of the following:

- for TPS only, enter 1.
- for TPS and Secure Media Controller, enter 6 or 1.

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

You are not prompted for S1 PK if S1 Action is set to 1.

S1 retry count	The number of times the IP Phone 2002 attempts to connect to the server. Enter 10.
----------------	--

S1 PK	Default is ffffffffffffffff.
-------	------------------------------

The Private key of the Secure Media Controller to which the IP Phone connects.

If you are using a Secure Media Controller, do the following:

- Set to 6 or 1.

Screen prompt	Description
S2 IP	<ul style="list-style-type: none"> Enter a 16-digit hexadecimal number. The secondary CS 1000 node IP address for the IP Phone 2002.
S2 Port	Same as S1.
S2 action	Same as S1.
S2 retry count	You are not prompted for S2 PK if S2 Action is set to 1. Same as S1.
S2 PK	Default is ffffffff. The Private key of the alternate Secure Media Controller to which the IP Phone connects. If you are using a Secure Media Controller, do the following: <ul style="list-style-type: none"> Set to 6 or 1. Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	Default 0 (for No) If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.
XAS IP:	Enter the IP address of the XAS server.
Speed (0-A, 1-10, 2-100)	Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT You are not prompted for Speed if PC Port is set to 0 for Off.
Duplex (0-A, 1-F, 2-H)	Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.

Screen prompt	Description
802.1Q (0-No, 1-Yes)	Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.
Voice VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.
VLAN Cfg? 0-Auto, 1-Man:	Default 0 (for Auto). You are not prompted for VLAN Cfg if Voice VLAN is not enabled. 0-Auto Automatically obtains VLAN ID using DHCP or the 802.1ab data switch. 1-Man Enter the VLAN ID manually. This is a number from 1 to 4094.
LLDP-MED? (0-No, 1-Yes)	If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV. You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.
LLDP VLAN? (0-No, 1-Yes)	If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV. You are not prompted for LLDP VLAN if VLAN is not set to Auto (2- Auto), or if LLDP is not enabled.
DHCP (0-No, 1-Yes)	If you select 1-Y (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server. You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.
VLANFILTER (0-N, 1-Y)	Default 0 (for No) You are not prompted for VLANFILTER if VLAN is not enabled.

Screen prompt	Description
Ctrl pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Ctrl pBits if 802.1Q is not enabled.
Media pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Media pBits if 802.1Q is not enabled.
PC Port? (0-Off, 1-On)	Default 1 (for On).
Speed (0-A, 1-10, 2-100)	Default 0 (for Auto). 0 = Auto 1 = 10 BT 2 = 100 BT You are not prompted for Speed if PC Port is set to 0 for Off.
Duplex (0-A, 1-F, 2-H)	Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half You are not prompted for Duplex if PC Port is set to 0 for Off and if Speed is set to 0 for Auto.
Data 802.1Q (0-N, 1-Y)	You are not prompted for Data 802.1Q if PC Port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.
Data VLAN Cfg? (0-Auto, 1-Man)	Default 1 (for Man). You are not prompted for Data VLAN Cfg if LLDP or Data VLAN are not enabled and PC Port is set to 0 for Off. If you select 0 (for Auto), VLAN ID is automatically configured to the value received in the VLAN NAME TLV.
Data VLAN ID:	You are not prompted for Data VLAN ID if Data VLAN is set to 0 for Auto.
Data pBits (0-7, 8-Au)	Default 8 (for Au). You are not prompted for Data pBits if the PC Port is set to 0 for Off or if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0-No, 1-Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 2002 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2002 searches for the TFTP Server for firmware upgrade. If the file name specified in i2002.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2002 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2002 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2002 searches for the connect server.

8 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password.
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your Call Server.
Node	The node ID.
TN	The TN or VTN.

The IP Phone 2002 registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 2002 resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 9 Check for a dial tone and the correct DN above the display.
- 10 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2002 User Guide (NN43116-104)*.

—End—

ATTENTION

Timing information

There are only 4 seconds between plugging in the IP Phone 2002 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 2002 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 11

Installing an IP Phone 2002 for the first time using DHCP

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.

- 3** Enter DeviceID and Password.
- If you select **No**, you are not prompted to enter Device ID and Password.
- For more information about EAP, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).
- 4** At the prompt, **LLDP Enable?**, enter 1-Y (1 for Yes, default).
- For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#). For more information about 802.1Q, see [Appendix "802.1Q VLAN description" \(page 443\)](#).
- 5** At the prompt **DHCP Yes/No?**, enter 1-Y (1 for Yes).
- By default, Full DHCP is configured on the IP Phone 2002. Depending on the configuration requirements, you can change the IP Phone 2002 configuration to allow the following IP address assignments:
- Static—enter all parameters
 - Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server
 - Full DHCP— (default) all parameters are obtained from the DHCP server
- A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.
- For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.
- 6** At the prompt, **Cached IP?**, select 0 (0-No, default) to conform to the DHCP standard and to obtain an IP address from the DHCP server. Select 1 (1 for Yes) to force the IP Phone to start with a cached IP address if the IP Phone cannot connect to the DHCP server and obtain an IP address.
- 7** Select Partial or Full DHCP.
- a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
- a valid IP Phone 2002 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 2002 on the LAN segment to which it connects

- the S1 IP (the primary CS 1000 node IP address of the IP Phone)
 - the S1 action
 - the S1 retry count (this is the number of times the IP Phone attempts to connect to the server)
 - the S2 IP (the secondary CS 1000 node IP address of the IP Phone)
 - the S2 action
 - the S2 retry count
 - the External Application Server (XAS) IP address
- b. If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 2002.
S1 Port	This is a fixed value: 4100
S1 action	Choose one of the following: <ul style="list-style-type: none"> • for TPS only, enter 1. • for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	The number of times the IP Phone 2002 attempts to connect to the server. Enter 10.

Screen prompt	Description
S1 PK	<p>Default is ffffffffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
S2 IP	The secondary CS 1000 node IP address for the IP Phone 2002.
S2 Port	Same as S1.
S2 action	<p>Same as S1.</p> <p>You are not prompted for S2 PK if S2 Action is set to 1.</p>
S2 retry count	Same as S1.
S2 PK	<p>Default is ffffffffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	<p>Default 0 (for No).</p> <p>If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.</p>
XAS IP:	Enter the IP address of the XAS server.

Screen prompt	Description
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>

8 Enter the following parameters:

Screen prompt	Description
802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Voice VLAN (0-N, 1-Y)	<p>Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.</p>
VLAN Cfg? (0-Auto, 1-Man)	<p>Default 0 (for Auto). 0-Auto Automatically obtains VLAN ID using DHCP, or the 802.1ab data switch. 1-Man Enter the VLAN ID manually. This is a number from 1 to 4094. You are not prompted for VLAN Cfg if Voice VLAN is not enabled.</p>
LLDP-MED? (0-N, 1-Y)	<p>Default 0 (for No). If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV. You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p>

Screen prompt	Description
LLDP VLAN? (0-No, 1-Yes)	<p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.</p> <p>You are not prompted for LLDP VLAN if VLAN is not set to Auto (2- Auto), or if LLDP is not enabled.</p>
DHCP (0-No, 1-Yes)	<p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.</p> <p>You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.</p>
VLANFILTER (0-No, 1-Yes)	<p>Default 0 (0 for No).</p> <p>You are not prompted for VLANFILTER if VLAN is not enabled.</p>
Duplex? (0-Auto, 1-Full)	Default 0 (for Auto).
Ctrl pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Ctrl pBits if 802.1Q is not enabled.</p>
Media pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Media pBits if 802.1Q is not enabled.</p>
PC Port? (0-Off, 1-On)	Default 1 (for On).
Speed (0-A, 1-10, 2-100)	<p>Default 0 (for Auto).</p> <p>0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto).</p> <p>0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off and if Speed is set to 0 for Auto.</p>

Screen prompt	Description
Data 802.1Q (0-N, 1-Y)	You are not prompted for Data 802.1Q if PC Port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.
Data VLAN Cfg? (0-Auto, 1-Man)	Default 1 (for Man) You are not prompted for Data VLAN Cfg if LLDP or Data VLAN are not enabled and PC Port is set to 0 for Off. If you select 0 (for Auto), VLAN ID is automatically configured to the value received in the VLAN NAME TLV.
Data VLAN ID:	You are not prompted for Data VLAN ID if Data VLAN is set to 0 for Auto.
Data pBits (0-7, 8-Au)	Default 8 (for Au). You are not prompted for Data pBits if the PC Port is set to 0 for Off or if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0-No, 1-Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 2002 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2002 searches for the TFTP Server for firmware upgrade. If the file name specified in i2002.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2002 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2002 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2002 searches for the connect server.

9 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password.
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your Call Server.
Node	the node ID.
TN	the TN or VTN.

The IP Phone 2002 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When complete, the IP Phone 2002 resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

10 Check for a dial tone and the correct DN above the display.

11 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2002 User Guide (NN43116-104)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing the duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 12 "Enabling Full Duplex mode" \(page 93\)](#) to enable Full Duplex mode.

Procedure 12 Enabling Full Duplex mode

Step	Action
1	Reset the phone by disconnecting and reconnecting power.
2	When the Nortel logo appears in the middle of the display, press each soft key in sequence. See Procedure 9 "Configuring the IP Phone 2002" (page 75) .
3	If no other configuration changes are required, press the OK soft key repeatedly until the Duplex network option appears.
4	Select 1 to enable Full Duplex mode.
5	When the Speed option appears, select one of the following: <ul style="list-style-type: none"> • 0 for 10 Mb/s • 1 for 100 Mb/s (default)
6	Select OK to confirm the change.
7	Restart the IP Phone. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 13 "Checking Ethernet Statistics" \(page 94\)](#) to confirm activation of Full Duplex mode.

Procedure 13
Checking Ethernet Statistics

Step Action

- 1 Double-click the **Services** key. The Network Diagnostics menu appears.
- 2 Select **Ethernet Statistics**.
 - If Full Duplex mode is active, the following is displayed:
 - Link: UP
 - Duplex: Full
 - Speed: 10 (Mb) or 100(Mb)
 - Auto-Negotiate Capability: N
 - Auto-Negotiate Completed: N

—End—

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection prevents the IP Phone 2002 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. The malicious device launches a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 10 "Installing the IP Phone 2002 for the first time using manual configuration" \(page 79\)](#) or [Procedure 11 "Installing an IP Phone 2002 for the first time using DHCP" \(page 85\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control"](#) (page 451).

Redeploying an IP Phone 2002

You can redeploy an existing previously configured IP Phone 2002 on the same Call Server. For example, the IP Phone 2002 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2002. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 14

Changing the TN of an existing IP Phone 2002

Step	Action						
1	<p>Repower the IP Phone 2002.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 2002 displays the existing node number for approximately 5 seconds.</p>						
2	<p>If the node password is enabled and NULL, choose one of the following:</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. 						
3	<p>Press OK when the node number displays.</p> <table border="0"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the node password is enabled and is not NULL</td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td>a TN screen displays. Go to Step 5.</td> </tr> </tbody> </table>	If	Then	the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .	the node password is disabled	a TN screen displays. Go to Step 5 .
If	Then						
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .						
the node password is disabled	a TN screen displays. Go to Step 5 .						
4	<p>Enter the password at the password screen and press OK.</p> <p>A TN screen displays.</p> <p>To obtain the password, enter the <code>nodePwdShow</code> command in Element Manager. For further information, see <i>Element Manager System Reference—Administration (NN43001-632)</i>.</p>						
5	Select the Clear soft key to clear the existing TN.						
6	Enter the new TN.						

—End—

Replacing an IP Phone 2002

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 2002 that currently uses the TN.

Procedure 15

Replacing an IP Phone 2002

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 2002 that you want to replace.
3	Follow Procedure 9 "Configuring the IP Phone 2002" (page 75) and Procedure 10 "Installing the IP Phone 2002 for the first time using manual configuration" (page 79) or Procedure 11 "Installing an IP Phone 2002 for the first time using DHCP" (page 85) to install and configure the IP Phone 2002.
4	Enter the same TN and Node Number as the IP Phone 2002 you replaced. The Call Server associates the new IP Phone 2002 with the existing TN.

—End—

Removing an IP Phone 2002 from service

Procedure 16

Removing an IP Phone 2002 from service

Step	Action
1	Disconnect the IP Phone 2002 from the network or turn off the power. The service to the PC is disconnected as well if the PC connects to the IP Phone 2002. If the IP Phone 2002 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.
2	In LD 11, enter OUT at the TN prompt.

—End—

Nortel IP Phone 2004

Contents

This section contains the following topics:

- "Introduction" (page 99)
- "Description" (page 100)
- "Components and functions" (page 101)
- "Supported features" (page 103)
- "Features not currently supported" (page 105)
- "Key number assignments" (page 107)
- "Package components" (page 108)
- "Installation and Configuration" (page 109)
- "Full Duplex mode" (page 129)
- "Gratuitous Address Resolution Protocol Protection" (page 131)
- "Extensible Authentication Protocol " (page 131)
- "Redeploying an IP Phone 2004" (page 131)
- "Replacing an IP Phone 2004" (page 132)
- "Removing an IP Phone 2004 from service" (page 133)

Introduction

This section explains how to install and maintain the IP Phone 2004. For information about using the IP Phone 2004, see the *IP Phone 2004 User Guide (NN43117-102)*.

This section contains the following procedures:

- Procedure 17 "Configuring the IP Phone 2004" (page 110).
- Procedure 18 "Installing the IP Phone 2004 for the first time using manual configuration" (page 114).
- Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP" (page 121).

- Procedure 20 "Enabling Full Duplex mode" (page 129).
- Procedure 21 "Checking Ethernet Statistics" (page 130).
- Procedure 22 "Changing the TN of an existing IP Phone 2004" (page 131).
- Procedure 23 "Replacing an IP Phone 2004" (page 132).
- Procedure 24 "Removing an IP Phone 2004 from service" (page 133).

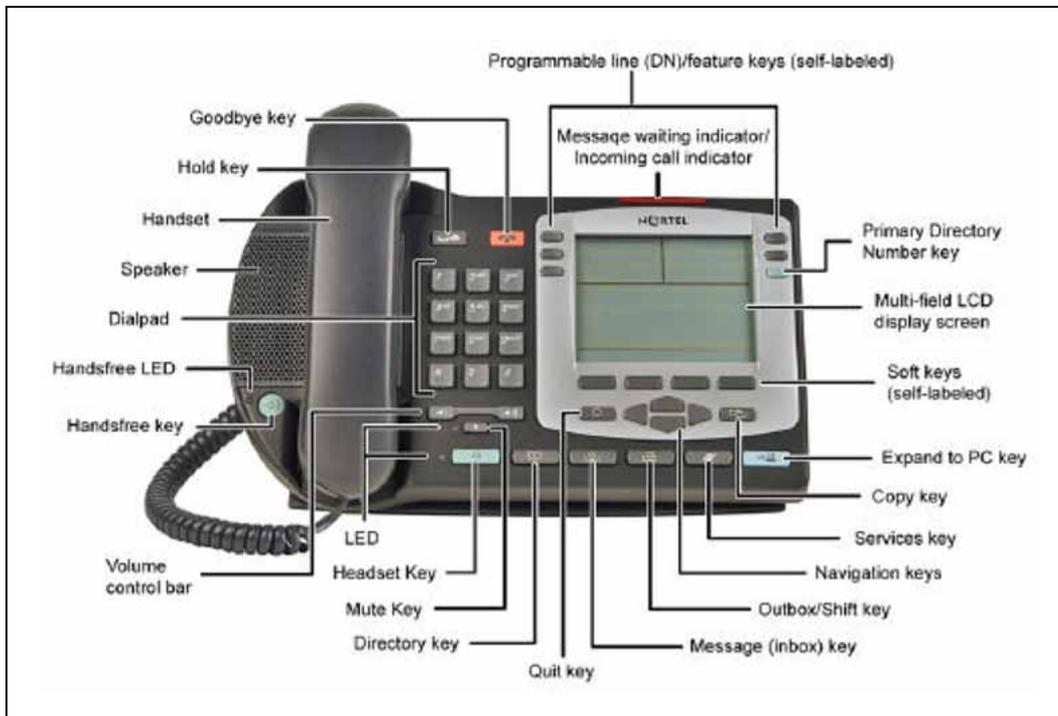
After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Phone 2004 uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 2004 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 2004 network connection, and Communication Server 1000 connection.

Figure 7 "IP Phone 2004" (page 100) shows the IP Phone 2004.

Figure 7
IP Phone 2004



Components and functions

This section describes the following components and functions of the IP Phone 2004:

- keys and functions
- Services menu

Keys and functions

Table 10 "IP Phone 2004 keys and functions" (page 101) shows the IP Phone 2004 keys and functions.

Table 10
IP Phone 2004 keys and functions

Key	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Message waiting light/ Incoming call indicator	The Message waiting indicator turns ON to indicate that a message has been left for the user. This indicator also flashes when the set ringer is ON.
Programmable line (DN)/feature keys (self-labeled)	Programmable line (DN)/feature keys (self-labeled) are configured for various features on the IP Phones. A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.
Context-sensitive soft keys (self-labeled)	Context-sensitive soft keys (self-labeled) are located below the display area. The LCD label above the key changes, based on the active feature. A triangle before a key label indicates that the key is active.
Fixed feature keys	Use these keys to access non-programmable standard features.
Expand to PC	The Expand to PC key is used to access external server applications such as External Application Server.
Copy	A fixed key reserved for future feature development. An audible non-working tone is generated along with a display message.
Navigation keys	Use the navigation keys to scroll through menus and lists in the display area.
Shift	Press the Shift key to switch between two feature key pages and access an additional six lines/features.
Message (Inbox)	Press the Message (Inbox) key to access your voice mailbox.

Key	Function
Quit	Press the Quit key to end an active application.
	Pressing the Quit key does not affect the status of the calls currently on your IP Phone.
Directory	Press the Directory key to access Directory services.
Mute	Press the Mute key to listen to the receiving party without transmitting.
	Press the Mute key again to return to a two-way conversation.
	The Mute key applies to Handsfree, Handset, and Headset microphones.
	The Mute LED flashes when the Mute option is in use.
Headset	Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.
Volume control bar	Use the Volume control bar to adjust the volume of the handset, headset, speaker, ringer, and Handsfree feature.
	Press the right side of the rocker bar to increase volume, the left side to decrease volume.
Handsfree key	Press the Handsfree key to activate handsfree.
	The LED lights to indicate when the handsfree feature is active.

Services menu

Table 11 "Services menu" (page 102) shows the Services menu.

Table 11
Services menu

Services key	Press the Services key to access the following items: <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language — Date/Time Format — Display diagnostics — Local Dialpad Tone — Ring type
--------------	---

- Call Timer
- OnHook Default Path
- Change Feature Key Label
- Set Info
- Live Dialpad
- Password Administration
- Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)
- Test Local Mode and Resume Local Mode (if Branch Office is configured)

Double-press the Services key to access Network diagnostic utilities. For more information about Network diagnostic utilities, see [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

If a call is presented while the user is manipulating an option, the IP Phone 2004 rings and the DN key flashes. However, the display is not updated with the Caller ID, and the programming text is not disturbed.

The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID, and Autodial and Last Number Redial intercept the dialpad.

During an incoming call, if the selected feature page does not contain the flashing DN line key, the display reverts to the active feature key page. This enables the user to answer the call without pressing the Shift key.

Supported features

The IP Phone 2004 supports the following telephony features:

- six programmable line (DN)/feature keys (self-labeled)
- four context-sensitive soft keys (self-labeled) that provide access to a maximum of nine features

Functions for the context-sensitive soft keys are configured in LD 11.

- volume control bar to adjust ringer, speaker, handset, and headset volume
- six specialized feature keys
 - Quit
 - Directory
 - Message/Inbox
 - Shift/Outbox
 - Services
 - Copy

- six call-processing fixed keys
 - Mute
 - Handsfree
 - Goodbye
 - Expand to PC
 - Headset
 - Hold
- Call Duration Timer
- ability to change the programmable line (DN)/feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 2004 supports the following data network features:

- integrated switch for shared PC access
 - the LAN Ethernet port supports 10/100BT Mb/s Full Duplex mode
 - the PC Ethernet port supports 10/100BT Mb/s Full Duplex mode
- automatic network configuration through DHCP
For more information about automatic network configuration, see [Table 13 "IP Phone 2004 IP parameters" \(page 113\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP)
For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption
For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).

- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone; allows VLAN and priority tagging for the IP Phone traffic and VLAN tagging for PC traffic
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.
- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN

For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).
- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 2
- Gratuitous Address Resolution Protocol (GARP) Protection

The IP Phone 2004 supports the following user interface features:

- External Application Server (XAS)
- language support: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana
- IP Key Expansion modules

Features not currently supported

The following features are not supported on the IP Phone 2004:

- Group Listening
- Set-to-Set messaging

Central Answering Position

The Central Answering Position (CAP) operates as an Automatic Call Distribution (ACD) agent on the IP Phone 2004. A CAP provides call-handling features, such as transferring a call, parking a call, and answering a call. You can add an IP Phone Key Expansion Module (KEM) to provide additional lines and features, Direct Station Select, and Busy Lamp Field functionality.

For further information about Central Answering Position, see *Central Answering Position Implementation Guide (NN43011-501)*.

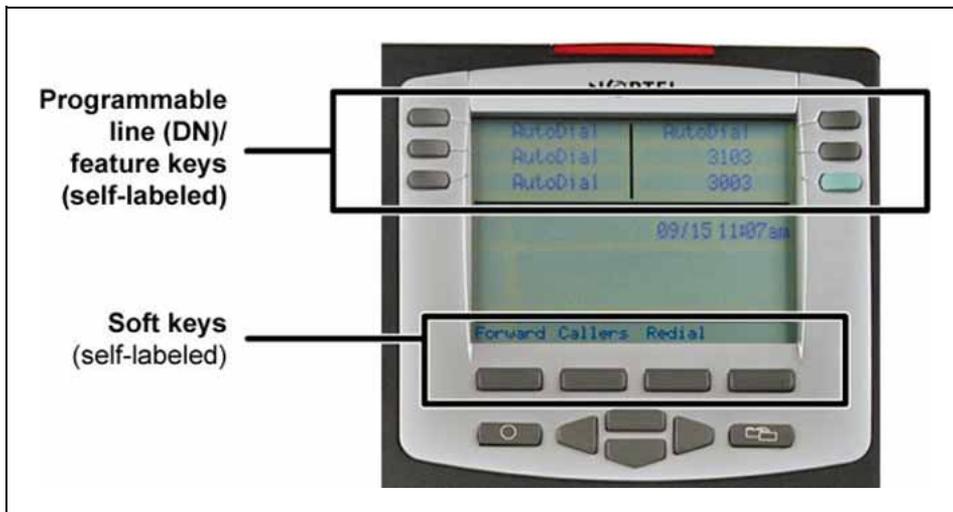
Display characteristics

An IP Phone 2004 has three major display areas:

- programmable line (DN)/feature key label
- information line
- soft key label

Figure 8 "IP Phone 2004 display areas" (page 106) shows the three display areas.

Figure 8
IP Phone 2004 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Programmable line (DN)/feature key label display

The feature key label area displays a 10-character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. A telephone icon displays the status of the configured DN. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

If a label is longer than 10 characters, the last 10 characters are displayed, and the excess characters are deleted from the beginning of the string.

Information line display

An IP Phone 2004 has a three-line information display area with the following information:

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state) or Call Timer (if provisioned in the Telephone options menu)

The information in the display area changes, according to the call-processing state and active features.

Soft key label display

The soft key label has a maximum six characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon appears at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. The icon remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, and returns the soft key label to its original state.

Use the More soft key to navigate the layers of functions. If there are only four functions assigned to the soft keys, the More key does not appear, and all four functions are displayed.

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined context-sensitive soft keys. Because the context-sensitive soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the context-sensitive soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four context-sensitive soft keys. Labels for the context-sensitive soft keys appear in the display area. For further information, see "[Soft key label display](#)" (page 107). [Figure 8 "IP Phone 2004 display areas"](#) (page 106) shows the IP Phone 2004 display area.

For a description of the IP Phone function assignment for each of the context-sensitive soft keys, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The following information applies to Phase II IP Phones. Product codes for Phase II IP Phones are different from previous sets.

See the product code on the back of the phone to confirm whether it is a Phase II IP Phone. The product code for Phase II IP Phones appears as IP Phone 200x. The product code for previous versions of the IP Phone appears with an i in front of the model number (for example, i200x).

You must order the AC power adapter separately if local power using the AC adapter is required, because Phase II IP Phones include integrated support for a number of power over LAN options, including support for IEEE 802.3af standard power.

[Table 12 "IP Phone 2004 component list" \(page 108\)](#) lists the IP Phone 2004 package components and product codes.

Table 12
IP Phone 2004 component list

IP Phone 2004 package contents includes	
<ul style="list-style-type: none"> • IP Phone 2004 • handset • handset cord • footstand • 7-ft. Ethernet cable • Getting Started card 	
IP Phone 2004 (Ethergray) with Icon keycaps	NTDU92AA16/A0533 408
IP Phone 2004 (Ethergray) with English text label keycaps	NTDU92BA16/A0533 409
IP Phone 2004 (Charcoal) with Icon keycaps	NTDU92AA70/A0533 410
IP Phone 2004 (Charcoal) with English text label keycaps	NTDU92BA70/A0533 411
IP Phone 2004 (Charcoal with Bezel) with Icon keycaps	NTDU92AB70
IP Phone 2004 (Charcoal with Bezel) with Icon keycaps (RoHS)	NTDU92AC70E6
IP Phone 2004 (Charcoal with Bezel) with English text label keycaps	NTDU92BB70

IP Phone 2004 (Charcoal with Bezel) with English text label keycaps (RoHS)	NTDU92BC70E6
IP Phone 2004 wall mount kit (Charcoal), used with Ethergray and Charcoal models	NTMN15BA70/A0503076
Replacement parts	
7-ft. Ethernet Cat5 cable	A0648375
Handset (Ethergray)	A0788874
Handset (Charcoal)	A0758634
Handset cord (Ethergray)	A0788682
Handset cord (Charcoal)	N0000764
Footstand (Charcoal), used for Ethergray and Charcoal models	A0538587
IP Phone 2004 Power Adapters	
Power transformer (117/120 VAC 50/60 Hz) (North America)	A0619627
Power transformer 3-prong AC to AC, direct plug-in, 8 W, 240 VAC, 50 Hz to 16 VAC at 500 mA (Ireland and UK)	A0656598
Power transformer AC to AC, direct plug-in, 8 W, 230 VAC, 50/60 Hz, to 16 VAC at 500 mA (Europe)	A0619635
Power transformer 2-prong wall plug direct plug-in AC to AC, 8 W, 240 VAC, 50 Hz, to 16 VAC at 500 mA (Australia and New Zealand)	A0647042
Power transformer AC to AC, direct plug-in, 8 W, 100 VAC, 50 Hz, to 16 VAC at 500 mA	A0828858

For more information, and for information about previous versions of the IP Phone, contact your Nortel representative.

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 2004:

- Before you begin
- First-time installation
- Configuring the IP Phone 2004
- Startup sequence
- Installing the IP Phone 2004

Before you begin

Before installing the IP Phone 2004, complete the following pre-installation checklist:

- Ensure one IP Phone 2004 boxed package exists for each IP Phone 2004 being installed. The package contains:

- IP Phone 2004
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - Getting Started Card
- Ensure 1 Software License for each IP Phone 2004 being installed.
 - Ensure the host Call Server is equipped with a Signaling Server that runs the Line TPS application.
 - If an AC power adapter is required, ensure you use the correct AC power transformer. The voltage rating of the transformer must match the wall outlet voltage. See [Table 12 "IP Phone 2004 component list" \(page 108\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Do not plug your IP Phone 2004 into an ISDN connection. Severe damage can result.

Configuring the IP Phone 2004

[Procedure 17 "Configuring the IP Phone 2004" \(page 110\)](#) to configure the IP Phone 2002 for the first time.

Procedure 17

Configuring the IP Phone 2004

Step	Action
------	--------

- | | |
|---|--|
| 1 | Configure a virtual loop on the Call Server using LD 97.

For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i> . |
| 2 | Configure the IP Phone 2004 on the Call Server using LD 11. At the prompt, enter the following:

<code>REQ: chg</code>
<code>TYPE: 2004P1, 2004P2</code> |

For more information about configuring the IP Phone 2004 using LD 11, see *Software Input Output Administration (NN43001-611)*.

- 3 Connect the IP Phone 2004 components:
 - a. Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon).
 - b. Connect the other end of the handset cord to the handset.
- 4 Choose one of the following connections:
 - For an IP Phone not sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone 2004 (identified with a LAN icon). The other end of the CAT5 Ethernet cable plugs into the IP network.

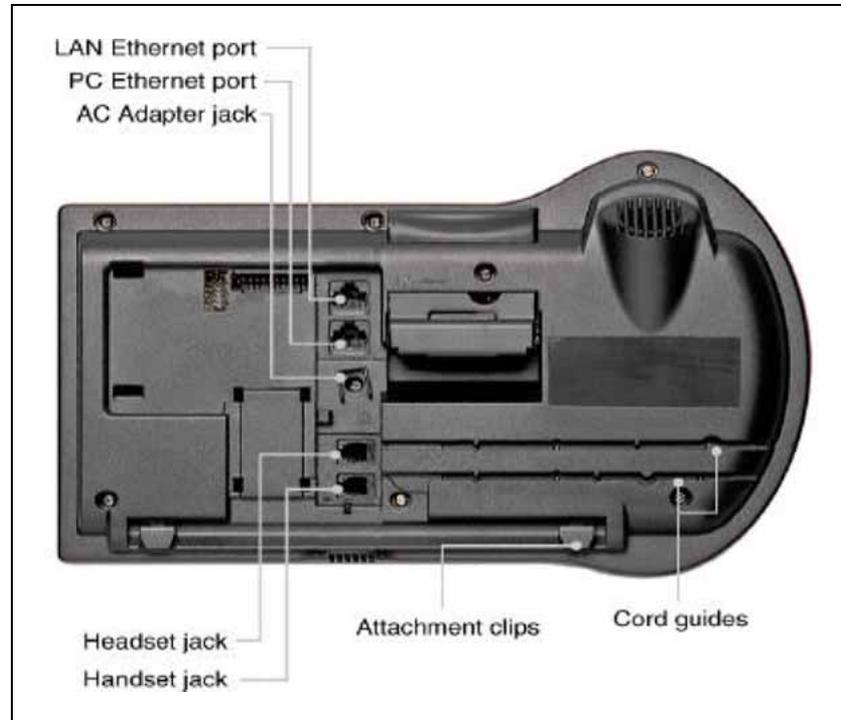
For an IP Phone sharing a LAN access with a PC:

Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon, see [Figure 9 "IP Phone 2004 Ethernet network connections" \(page 112\)](#)) and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC Ethernet port located on the back of the IP Phone (identified with a PC icon, see [Figure 9 "IP Phone 2004 Ethernet network connections" \(page 112\)](#)) and the other end into the computer.

**CAUTION****Damage to Equipment**

Do not plug any device into your IP Phone 2004 Ethernet port other than one PC. The IP Phone 2004 does not support multiple devices connected through the PC Ethernet port.

Figure 9
IP Phone 2004 Ethernet network connections



- 5 Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable and then thread the adapter cord through the channels in the stand.
- 6 Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.
- 7 Power the IP Phone 2002 using either the Power over Ethernet or an AC power transformer (local power). If you are using local power, plug the AC power transformer into the nearest power outlet. Make sure you use the correct AC power transformer is used. The voltage rating of the transformer must match the wall outlet voltage. See [Table 12 "IP Phone 2004 component list" \(page 108\)](#).

The IP Phone 2004 supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 2. To use Power over Ethernet, where power is delivered over the CAT5 cable,

the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

- 8 Use [Procedure 18 "Installing the IP Phone 2004 for the first time using manual configuration"](#) (page 114) to install the IP Phone 2004 for the first time using manual configuration, or use [Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP"](#) (page 121) to install the IP Phone 2004 for the first time using DHCP.

—End—

Startup sequence

When an IP Phone 2004 connects to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 13 "IP Phone 2004 IP parameters"](#) (page 113) for a summary of the IP parameters and how they are obtained.

Table 13
IP Phone 2004 IP parameters

Parameter	Method of Acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Installing the IP Phone 2004

To install the IP Phone 2004 for the first time using manual configuration, use [Procedure 18 "Installing the IP Phone 2004 for the first time using manual configuration" \(page 114\)](#). To install the IP Phone 2004 for the first time using DHCP, use [Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP" \(page 121\)](#).

ATTENTION

Timing information

There are only four second(s) between plugging in the IP Phone 2004 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 2004 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 18

Installing the IP Phone 2004 for the first time using manual configuration

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select No , you are not prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451) .
4	At the prompt, LLDP Enable? , enter 1-Y (1 for Yes, default).

For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#). For more information about 802.1Q, see [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 5** At the prompt **DHCP Yes/No?**, enter 0-N (0 for No).

By default, Full DHCP is configured on the IP Phone 2004. Depending on the configuration requirements, you can change the IP Phone 2004 configuration to allow the following IP address assignments:

- Static—enter all parameters
- Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server
- Full DHCP— (default) all parameters are obtained from the DHCP server

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration. For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 6** Enter the following information:

Screen prompt	Description
set IP	a valid IP Phone 2004 IP address.
net msk	a subnet mask.
def gw	the default Gateway for the IP Phone 2004 on the LAN segment to which it connects.

- 7** Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 2004.
S1 Port	This is a fixed value: 4100

Screen prompt	Description
S1 action	<p>Choose one of the following:</p> <ul style="list-style-type: none">• for TPS only, enter 1.• for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	<p>The number of times the IP Phone 2004 attempts to connect to the server. Enter 10.</p>
S1 PK	<p>Default is ffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none">• Set to 6 or 1.• Enter a 16-digit hexadecimal number.
S2 IP	<p>The secondary CS 1000 node IP address for the IP Phone 2004.</p>
S2 Port	<p>Same as S1.</p>
S2 action	<p>Same as S1.</p> <p>You are not prompted for S2 PK if S2 Action is set to 1.</p>
S2 retry count	<p>Same as S1.</p>

Screen prompt	Description
S2 PK	<p>Default is ffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	<p>Default 0 (for No).</p> <p>If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.</p>
XAS IP:	<p>Enter the IP address of the XAS server.</p>
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>
802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Voice VLAN? (0-N, 1-Y)	<p>Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.</p>

Screen prompt	Description
VLAN Cfg? 0-Auto, 1-Man:	<p>Default 0 (for Auto).</p> <p>You are not prompted for VLAN Cfg is Voice VLAN is not enabled.</p> <p>0-Auto Automatically obtains VLAN ID using DHCP or the 802.1ab data switch.</p> <p>1-Man Enter the VLAN ID manually. This is a number from 1 to 4094.</p>
LLDP-MED? (0-No, 1-Yes)	<p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV.</p> <p>You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p>
LLDP VLAN? (0-No, 1-Yes)	<p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.</p>
DHCP (0-No, 1-Yes)	<p>You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.</p> <p>If you select 1-Y (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.</p>
VLANFILTER (0-N, 1-Y)	<p>You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.</p> <p>Default 0 (for No).</p>
Ctrl pBits (0-7, 8-Au)	<p>You are not prompted for VLANFILTER if VLAN is not enabled.</p> <p>Default 8 (for Auto).</p> <p>You are not prompted for Ctrl pBits if 802.1Q is not enabled.</p>

Screen prompt	Description
Media pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Media pBits if 802.1Q is not enabled.
PC Port? (0-Off, 1-On)	Default 1 (for On).
Speed (0-A, 1-10, 2-100)	Default 0 (for Auto). 0 = Auto 1 = 10 BT 2 = 100 BT You are not prompted for Speed if PC Port is set to 0 for Off.
Duplex (0-A, 1-F, 2-H)	Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half You are not prompted for Duplex if PC Port is set to 0 for Off and if Speed is set to 0 for Auto.
Data 802.1Q (0-N, 1-Y)	You are not prompted for Data 802.1Q if PC Port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.
Data VLAN Cfg? (0-Auto, 1-Man)	Default 1 (for Man). You are not prompted for Data VLAN Cfg if LLDP or Data VLAN are not enabled and PC Port is set to 0 for Off. If you select 0 (for Auto), VLAN ID is automatically configured to the value received in the VLAN NAME TLV.
Data VLAN ID:	You are not prompted for Data VLAN ID if Data VLAN is set to 0 for Auto.
Data pBits (0-7, 8-Au)	Default 8 (for Au). You are not prompted for Data pBits if the PC Port is set to 0 for Off or if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0-No, 1-Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 2004 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2004 searches for the TFTP Server for firmware upgrade. If the file name specified in i2004.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2004 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2004 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2004 searches for the connect server.

8 Enter the following information

The IP Phone 2004 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When registration is complete, the IP Phone 2004 resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

9 Check for a dial tone and the correct DN above the display.

10 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2004 User Guide (NN43117-102)*.

—End—

ATTENTION

Timing information

There are only four seconds between plugging in the IP Phone 2004 power transformer and the appearance of the Nortel logo in the middle of the display. When you see the logo, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 2004 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

To edit network configuration, the following soft keys are available:

- **OK**—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- **BkSpace**—erase a configuration entry to change it
- **Clear**—clear an entire configuration entry
- **Cancel**—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 19

Installing an IP Phone 2004 for the first time using DHCP

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select No , you are not be prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451) .
4	At the prompt, LLDP Enable? , enter 1-Y (1 for Yes, default).

For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#). For more information about 802.1Q, see [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 5** At the prompt **DHCP Yes/No?**, enter 1-Y (1 for Yes).

By default, Full DHCP is configured on the IP Phone 2004. Depending on the configuration requirements, you can change the IP Phone 2004 configuration to allow the following IP address assignments:

- Static—enter all parameters
- Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server
- Full DHCP— (default) all parameters are obtained from the DHCP server

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.

For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 6** At the prompt, **Cached IP?**, select 0 (0-No, default) to conform to the DHCP standard and to obtain an IP address from the DHCP server. Select 1 (1 for Yes) to force the IP Phone to start with a cached IP address if the IP Phone cannot connect to the DHCP server and obtain an IP address.

- 7** Select Partial or Full DHCP.

- a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:
- a valid IP Phone 2004 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 2004 on the LAN segment to which it connects
 - the S1 IP (the primary CS 1000 node IP address of the IP Phone)
 - the S1 Action
 - the S1 retry count (this is the number of times the IP Phone attempts to connect to the server)

- the S2 IP (the secondary CS 1000 node IP address of the IP Phone)
 - the S2 Action
 - the S2 retry count
 - the External Application Server (XAS) IP address
- b. If you select Partial DHCP, then you must enter the following parameters:

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 2004.
S1 Port	This is a fixed value: 4100.
S1 action	Choose one of the following: <ul style="list-style-type: none"> • for TPS only, enter 1. • for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	The number of times the IP Phone 2004 attempts to connect to the server. Enter 10.
S1 PK	Default is ffffffff. The Private key of the Secure Media Controller to which the IP Phone connects. If you are using a Secure Media Controller, do the following: <ul style="list-style-type: none"> • Set to 6 or 1.

Screen prompt	Description
S2 IP	<ul style="list-style-type: none">Enter a 16-digit hexadecimal number. The secondary CS 1000 node IP address for the IP Phone 2004.
S2 Port	Same as S1.
S2 action	Same as S1. You are not prompted for S2 PK if S2 Action is set to 1.
S2 retry count	Same as S1.
S2 PK	Default is ffffffff. The Private key of the alternate Secure Media Controller to which the IP Phone connects. If you are using a Secure Media Controller, do the following: <ul style="list-style-type: none">Set to 6 or 1.Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	Default 1 (for Yes). If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.
XAS IP:	Enter the IP address of the XAS server.

Screen prompt	Description
Speed (0-A, 1-10, 2-100)	Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT You are not prompted for Speed if PC Port is set to 0 for Off.
Duplex (0-A, 1-F, 2-H)	Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.

8 Enter the following parameters:

Screen prompt	Description
802.1Q (0-No, 1-Yes)	Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.
Voice VLAN (0-N, 1-Y)	Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.
VLAN Cfg? (0-Auto, 1-Man)	Default 0 (for Auto). 0-Auto Automatically obtains VLAN ID using DHCP, or the 802.1ab data switch. 1-Man Enter the VLAN ID manually. This is a number from 1 to 4094. You are not prompted for VLAN Cfg if Voice VLAN is not enabled.

Screen prompt	Description
LLDP-MED? (0-N, 1-Y)	<p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV.</p>
LLDP VLAN? (0-No, 1-Yes)	<p>You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p> <p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.</p>
DHCP (0-No, 1-Yes)	<p>You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.</p> <p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.</p>
VLANFILTER (0-No, 1-Yes)	<p>You are not prompted for DHCP VLAN if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.</p> <p>Default 0 (0 for No).</p> <p>You are not prompted for VLANFILTER if VLAN is not enabled.</p>
Duplex? (0-Auto, 1-Full)	Default 0 (for Auto).
Ctrl pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Ctrl pBits if 802.1Q is not enabled.</p>
Media pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Media pBits if 802.1Q is not enabled.</p>
PC Port? (0-Off, 1-On)	Default 1 (for On).

Screen prompt	Description
Speed (0-A, 1-10, 2-100)	Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT You are not prompted for Speed if PC Port is set to 0 for Off.
Duplex (0-A, 1-F, 2-H)	Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half You are not prompted for Duplex if PC Port is set to 0 for Off and if Speed is set to 0 for Auto.
Data 802.1Q (0-N, 1-Y)	You are not prompted for Data 802.1Q if PC Port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.
Data VLAN Cfg? (0-Auto, 1-Man)	Default 1 (for Man). You are not prompted for Data VLAN Cfg if LLDP or Data VLAN are not enabled and PC Port is set to 0 for Off. If you select 0 (for Auto), VLAN ID is automatically configured to the value received in the VLAN NAME TLV.
Data VLAN ID:	You are not prompted for Data VLAN ID if Data VLAN is set to 0 for Auto.
Data pBits (0-7, 8-Au)	Default 8 (for Au). You are not prompted for Data pBits if the PC Port is set to 0 for Off or if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0-No, 1-Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 2004 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2004 searches for the TFTP Server for firmware upgrade. If the file name specified in i2004.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2004 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2004 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2004 searches for the connect server.

9 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password. You are not prompted to enter the IP Phone Installer Password if it has not been configured in your Call Server.
Node	The node ID.
TN	The TN or VTN.

The IP Phone 2004 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Phone 2004 resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 10 Check for a dial tone and the correct DN above the display.
- 11 (Optional) Customize the feature keys as required. For more information, see *IP Phone 2004 User Guide (NN43117-102)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing the duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 20 "Enabling Full Duplex mode" \(page 129\)](#) to enable Full Duplex mode.

Procedure 20 Enabling Full Duplex mode

Step	Action
1	Reset the IP Phone 2004 by disconnecting and reconnecting power.
2	When the Nortel logo appears in the middle of the display, press each soft key in sequence. See Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP" (page 121) .

- 3 If no other configuration changes are required, press **OK** repeatedly until the Duplex network option appears.
- 4 Select 1 to enable Full Duplex mode.
- 5 When the Speed option appears, select one of the following:
 - 0 for 10 Mb/s
 - 1 for 100 Mb/s (default)
- 6 Select **OK** to confirm the change.
- 7 Restart the IP Phone 2004. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 21 "Checking Ethernet Statistics" \(page 130\)](#) to confirm activation of Full Duplex mode.

Procedure 21
Checking Ethernet Statistics

Step Action

- 1 Double-click the **Services** key. The Network Diagnostics menu appears.
- 2 Select **Ethernet Statistics**.
 - If Full Duplex mode is active, the following is displayed:
 - Link: UP
 - Duplex: Full
 - Speed: 10 (Mb) or 100(Mb)
 - Auto-Negotiate Capability: N
 - Auto-Negotiate Completed: N

—End—

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection prevents the IP Phone 2004 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. The malicious device also launches a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 18 "Installing the IP Phone 2004 for the first time using manual configuration" \(page 114\)](#) or [Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP" \(page 121\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Redeploying an IP Phone 2004

You can redeploy an existing previously configured IP Phone 2004 on the same Call Server. For example, the IP Phone 2004 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2004. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 22

Changing the TN of an existing IP Phone 2004

Step	Action
------	--------

- | | |
|---|--|
| 1 | <p>Repower the IP Phone 2004.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 2004 displays the existing node number for approximately five seconds.</p> |
| 2 | <p>If the node password is enabled and NULL, choose one of the following:</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. |

- 3** Press **OK** when the node number displays.
- | | |
|--|--|
| If | Then |
| the node password is enabled and is not NULL | a password screen displays. Go to Step 4 . |
| the node password is disabled | a TN screen displays. Go to Step 5 . |
- 4** Enter the password at the password screen, and press **OK**.
A TN screen displays.
To obtain the password, enter the nodePwdShow command in Element Manager. For further information, see *Element Manager System Reference—Administration (NN43001-632)*.
- 5** Select the **Clear** soft key to clear the existing TN.
- 6** Enter the new TN.

—End—

Replacing an IP Phone 2004

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 2004 that currently uses the TN.

Procedure 23 Replacing an IP Phone 2004

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 2004 that you want to replace.
3	Follow Procedure 17 "Configuring the IP Phone 2004" (page 110) and Procedure 18 "Installing the IP Phone 2004 for the first time using manual configuration" (page 114) or Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP" (page 121) to install and configure the IP Phone 2004.
4	Enter the same TN and Node Number as the IP Phone 2004 you replaced. The Call Server associates the new IP Phone 2004 with the existing TN.

—End—

Removing an IP Phone 2004 from service

Procedure 24

Removing an IP Phone 2004 from service

Step	Action
------	--------

- | | |
|---|---|
| 1 | Disconnect the IP Phone 2004 from the network or turn the power off.
The service to the PC is disconnected as well if the PC connects to the IP Phone 2004.

If the IP Phone 2004 was automatically configured, the DHCP lease expires and the IP address returns to the available pool. |
| 2 | In LD 11, enter OUT at the TN prompt. |
-

—End—

Nortel IP Audio Conference Phone 2033

Contents

- "Introduction" (page 135)
- "Description" (page 136)
- "Extension microphones" (page 137)
- "Components and functions" (page 138)
- "Supported features" (page 140)
- "Display characteristics" (page 142)
- "Key number assignments" (page 144)
- "Package components" (page 144)
- "Installation and Configuration" (page 147)
- "Full Duplex mode" (page 164)
- "Extensible Authentication Protocol " (page 166)
- "Redeploying an IP Audio Conference Phone 2033" (page 166)
- "Replacing an IP Audio Conference Phone 2033" (page 167)
- "Removing an IP Audio Conference Phone 2033 from service" (page 168)
- "Connecting an extension microphone" (page 168)

Introduction

This section explains how to install and maintain the IP Audio Conference Phone 2033. For information about using the IP Audio Conference Phone 2033, see the *IP Phone Audio Conference Phone 2033 User Guide (NN43111-100)*.

This section contains the following procedures:

- Procedure 25 "Configuring the IP Audio Conference Phone 2033" (page 148)

- Procedure 26 "Installing the IP Audio Conference Phone 2033 for the first time using manual configuration" (page 151)
- Procedure 27 "Installing an IP Audio Conference Phone 2033 for the first time using DHCP" (page 158)
- Procedure 28 "Enable Full Duplex mode" (page 165)
- Procedure 29 "Checking Ethernet Statistics" (page 165)
- Procedure 30 "Changing the TN of an existing IP Audio Conference Phone 2033" (page 166)
- Procedure 31 "Replacing an IP Audio Conference Phone 2033" (page 167)
- Procedure 32 "Removing an IP Audio Conference Phone 2033 from service" (page 168)

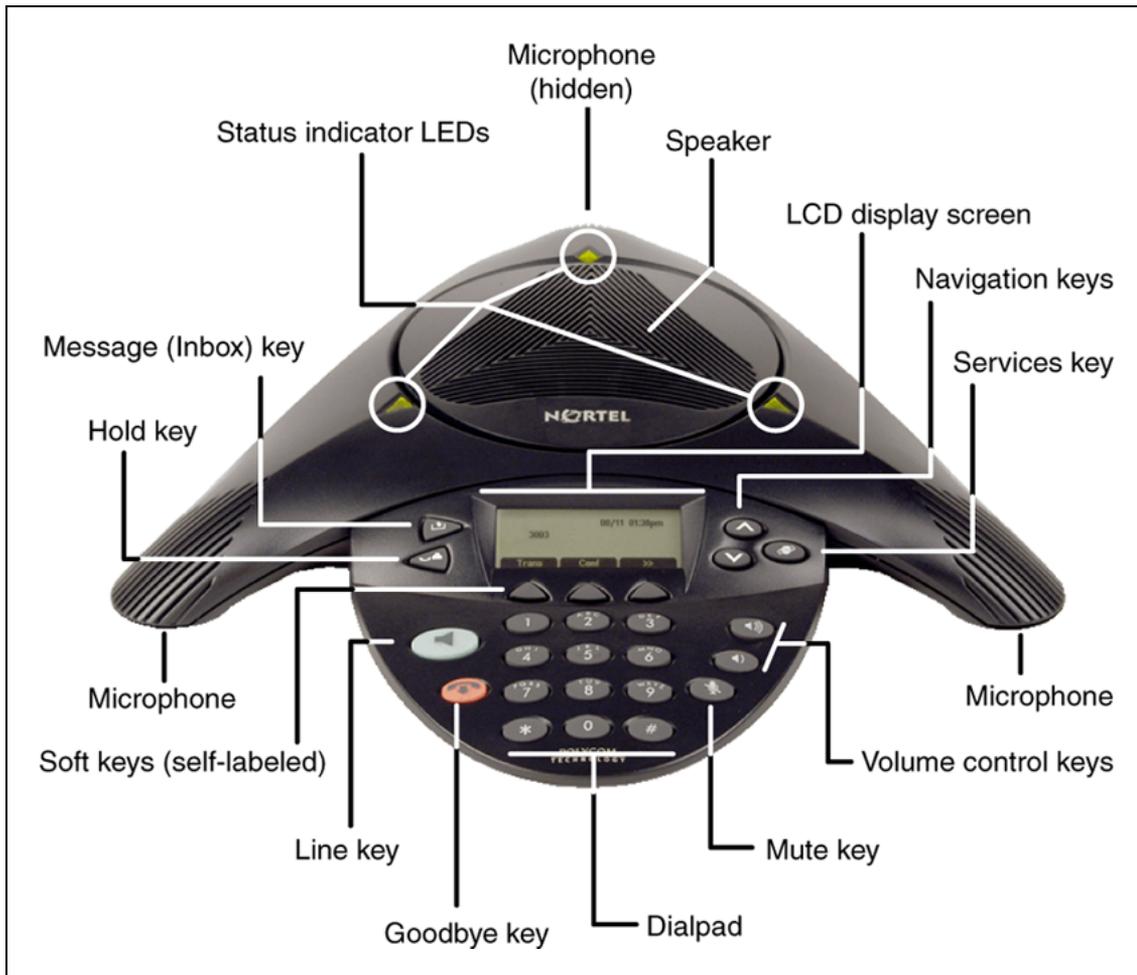
After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Audio Conference Phone 2033 uses the customer IP data network to communicate with the Communication Server 1000. The IP Audio Conference Phone 2033 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Audio Conference Phone 2033 network connection, and Communication Server 1000 connection.

Figure 10 "IP Audio Conference Phone 2033" (page 137) shows the IP Audio Conference Phone 2033.

Figure 10
IP Audio Conference Phone 2033

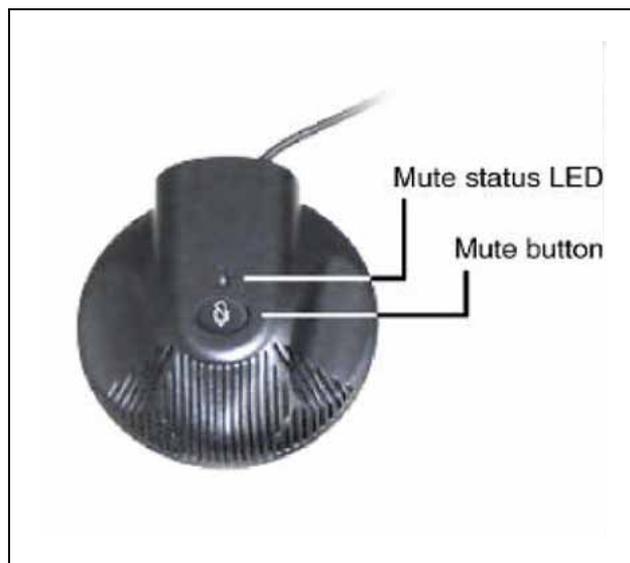


Extension microphones

The IP Audio Conference Phone 2033 supports up to two extension microphones that extend the microphone range in large rooms. Each extension microphone has a Mute button and an LED indicator to indicate the current mute state.

Figure 11 "Extension microphone" (page 138) shows an extension microphone.

Figure 11
Extension microphone



Components and functions

This section describes the following components and functions of the IP Audio Conference Phone 2033:

- Keys and functions
- Services menu

Keys and functions

[Table 14 "IP Audio Conference Phone 2033 keys and functions" \(page 138\)](#) describes the IP Audio Conference Phone 2033 keys and functions.

Table 14
IP Audio Conference Phone 2033 keys and functions

Key	Function
Line key	Use the Line key to access the single line and activate on-hook dialing.
Volume control buttons	Use the Volume control buttons to adjust the volume of the ringer and speaker.
Mute button	Use the Mute button on the main unit or any extension microphone to mute the speaker. Pressing the Mute button on the extension microphone toggles the mute state of the entire IP Phone, not just the microphone.
Goodbye key	Use the Goodbye key to terminate an active call.

Key	Function
Hold key	Press the Hold key to put an active call on hold. Press the Line (DN) key to return to the caller on hold.
Message (Inbox) key	Press the Message (Inbox) key to access your voice mailbox.
Navigation keys	Use the Navigation keys to scroll through menus and lists that appear on the LCD display screen.
Context-sensitive soft keys	<p>Arrows appear on the left side of display screen to indicate there is more information to be displayed.</p> <p>Context-sensitive soft keys (self-labeled) are located below the LCD screen display. The LCD screen display above the key changes, based on the active feature. See "Soft key label display" (page 143) for further information.</p> <p>Press the Shift soft key labelled >> to access the second row of soft keys.</p> <p>When a triangle appears before a key label, the feature is active.</p>

Services menu

[Table 15 "Services menu"](#) (page 139) shows the Services menu.

Table 15
Services menu

Services key	<p>Press the Services key to access the following items:</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume adjustment — Contrast adjustment — Language — Date/Time — Local DialPad Tone — Set Info — Diagnostics — Ring type — Call Timer — Live Dialpad • Password Admin
--------------	---

- Station Control Password
- Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)
- Test Local Mode and Resume Local Mode (if Media Gateway 1000B is configured)

Press the Services key to exit from any menu or menu item.

Double-press the Services key to access Network diagnostic utilities. For more information about Network diagnostic utilities, see [Appendix "IP Phone diagnostic utilities"](#) (page 465).

Network diagnostic utilities is available in Remote Mode only.

If a call is presented while the user is manipulating information, the phone rings. However, the display is not updated with the Caller ID, and the programming text is not disturbed.

The user can originate a call using Last Number Redial while manipulating an option.

Supported features

The Nortel IP Audio Conference Phone 2033 supports the following telephony features:

- three context-sensitive soft keys that provide access to a maximum of nine features

Functions for the context-sensitive soft keys are configured in LD 11.

- volume control keys to adjust ringer, speaker volume
- two specialized feature keys
 - Message/Inbox
 - Services
- three call processing keys
 - Mute
 - Goodbye
 - Hold
- Virtual Office
- Enhanced UNISlim Firmware Download
- IP Call Recording
- UNISlim encryption
- DTMF Tones

- Live Dialpad

The IP Audio Conference Phone 2033 supports the following data network features:

- 10/100 Mb/s Full Duplex mode
- automatic network configuration through DHCP

For more information about automatic network configuration, see [Table 19 "IP Audio Conference Phone 2033 IP parameters" \(page 150\)](#).

- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN

For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 0

The IP Audio Conference Phone 2033 supports the following languages:

English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, Turkish, and Katakana

Features not currently supported

- External three-port switch to support sharing LAN access with a PC or other data device is not provided. However, the IP Audio Conference Phone 2033 does provide 100 Mb/s full-duplex support.
- Integrated switch
- Personal Directory, Callers List, and Redial List are not supported. However, if the primary DN on an IP Audio Conference Phone 2033 is an MADN of an IP Phone 2001, IP Phone 2002, IP Phone 2004, or IP Softphone 2050, Preferred Name Match and Idle Set Display (new call indication) are supported.
- Corporate Directory

- Callers List
- Redial List
- Personal Directory
- Automatic Call Distribution
- IP Key Expansion Modules
- Support of accessory modules
- Group Listening
- Set-to-Set messaging
- Headset support
- External Applications Server

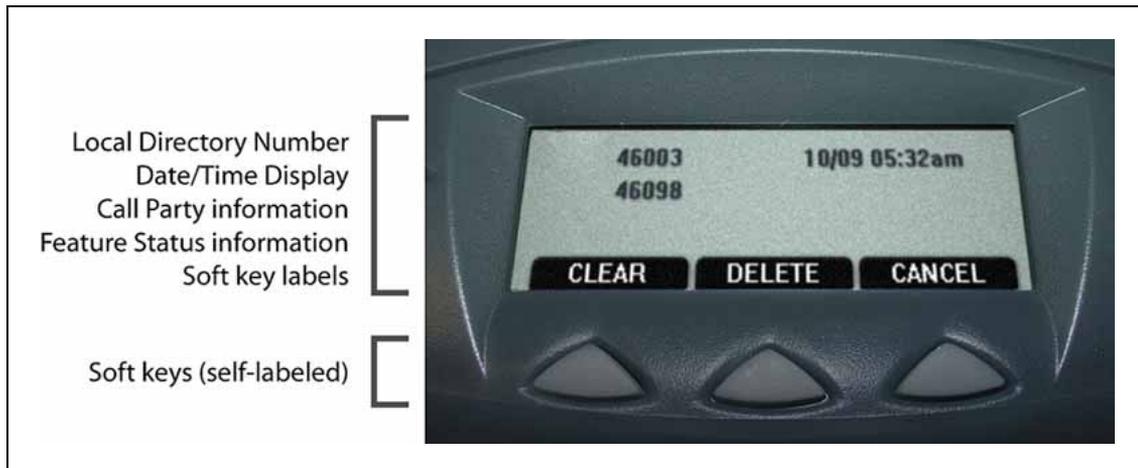
Display characteristics

The IP Audio Conference Phone 2033 has two display areas:

- information line display
- soft key label display

Figure 12 "IP Audio Conference Phone 2033 display areas" (page 142) on Figure 12 "IP Audio Conference Phone 2033 display areas" (page 142) shows the two display areas.

Figure 12
IP Audio Conference Phone 2033 display areas



Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.

**CAUTION**

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Information line display

The IP Audio Conference Phone 2033 has a one-line information display area with the following information:

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state) or Call Timer (if provisioned in the Telephone options menu)
- set information

The information in the display area changes, according to the call-processing state and active features.

Soft key label display

The soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a soft key is enabled, the icon state changes to on. It remains in the on state until the soft key is pressed again. This cancels the enabled soft key and turns the icon off, returning the soft key label to its original state.

Use the Shift (>>) key to navigate through the layers of functions. If only three functions are assigned to the soft keys, the Shift (>>) key does not appear, and all three functions are displayed.

Figure 13 "Soft keys" (page 144) shows the soft keys on the display area.

Figure 13
Soft keys



Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined context-sensitive soft keys. Because the context-sensitive soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the context-sensitive soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four context-sensitive soft keys. Labels for the context-sensitive soft keys appear in the display area. For further information, see ["Soft key label display" \(page 143\)](#). [Figure 12 "IP Audio Conference Phone 2033 display areas" \(page 142\)](#) shows the IP Phone 2004 display area.

For a description of the IP Phone function assignment for each of the context-sensitive soft keys, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

[Table 16 "Components list for US, CA, CALA, AP, and GC" \(page 144\)](#) lists the components for the IP Audio Conference Phone 2033 for the Americas, Asia Pacific, and Greater China region.

Table 16
Components list for US, CA, CALA, AP, and GC

<p>IP Audio Conference Phone 2033 package contents include</p> <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7-ft. CAT5 Ethernet cable • Power Interface Module (PIM) with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card 	<p>NTEX11AA70</p>
--	-------------------

Universal power supply	
IP Audio Conference Phone 2033 package contents include <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7-ft. CAT5 Ethernet cable • Power over Ethernet (PoE) Module with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card • 2 Extension microphones (charcoal) Universal power supply	NTEX11BA70
IP Audio Conference Phone 2033 package contents include <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7-ft. CAT5 Ethernet cable • Power over Ethernet (PoE) module with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card Universal power supply	NTEX11EA70
Accessories	
Power accessory kit (PIM, Universal power supply, cabling)	NTEX11CA
Power over Ethernet module	NTEX11GAE6
Extension microphone with 7-ft. cable	NTEX11DA70

Table 17 "Components list for EMEA" (page 145) lists the components for Europe, Middle East and Africa (EMEA) regions.

Table 17
Components list for EMEA

IP Audio Conference Phone 2033 package contents include <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7-ft. CAT5 Ethernet cable • Power over Ethernet (PoE) module with 25 ft. console cable 	NTEX11AA70E6
--	--------------

IP Audio Conference Phone 2033 Quick Reference Card	
<p>IP Audio Conference Phone 2033 package contents include</p> <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7-ft. CAT5 Ethernet cable • Power over Ethernet (PoE) module with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card <p>2 Extension microphones (charcoal)</p>	NTEX11BA70E6
<p>IP Audio Conference Phone 2033 package contents include</p> <ul style="list-style-type: none"> • IP Audio Conference Phone 2033 (charcoal) • 7-ft. CAT5 Ethernet cable • Power over Ethernet (PoE) module with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card • Universal Power Supply 	NTEX11EA70E6
<p>IP Audio Conference Phone 2033 package contents include</p> <p>IP Audio Conference Phone 2033 (charcoal)</p> <ul style="list-style-type: none"> • 7-ft. CAT5 Ethernet cable • Power over Ethernet (PoE) module with 25 ft. console cable • IP Audio Conference Phone 2033 Quick Reference Card • 2 Extension microphones (charcoal) with cables • Universal Power Supply 	NTEX11FA70E6
Accessories	
<ul style="list-style-type: none"> • Universal Power Supply (order power cord separately) 	NTEX11CAE6

• Power over Ethernet module	NTEX11GAE6
• Extension microphones (charcoal) with cables	NTEX11DA70E6

Table 18
Power cords

IP Phone IP Audio Conference Phone 2033 Power cords	
NA NEMA 5-15P, 125V 13A (10ft.)	NTTK14AB
Euro CEE (7) VII, 250V, 10A (2.5m)	NTTK16AB
ANZ AS3112, 250V 10A (2.5m)	NTTK15AA
Swiss SEV 1011, 250V 10A (8ft.)	NTTK17AB
UK/Ireland BS1363, 240V 10A (8ft.)	NTTK18AB
Denmark AFSNIT, 250V 10A (2.5m)	NTTK22AB
Argentina IRAM 2073, 250V 10A (8ft.)	A0814961
Japan 1.8 m (5.9 ft), 10 amp, IEC320-C13	NTTK26AAE6

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Audio Conference Phone 2033:

- Before you begin
- First-time installation
- Configuring the IP Audio Conference Phone 2033
- Startup sequence
- Installing the IP Audio Conference Phone 2033

Before you begin

Before installing the IP Audio Conference Phone 2033, complete the following pre-installation checklist:

- Ensure 1 Software License for each IP Audio Conference 2033 Phone being installed.
- Ensure one IP Audio Conference Phone 2033 boxed package exists for each IP Audio Conference Phone 2033 being installed. See [Table 16 "Components list for US, CA, CALA, AP, and GC" \(page 144\)](#) or [Table 17 "Components list for EMEA" \(page 145\)](#) for a list of package contents.
- Ensure the host Call Server is equipped with a Signaling Server that runs the Line TPS application.
- If an AC power adapter is required, ensure you use the correct AC power transformer. The voltage rating of the transformer must match the wall

outlet voltage. See [Table 16 "Components list for US, CA, CALA, AP, and GC" \(page 144\)](#) or [Table 17 "Components list for EMEA" \(page 145\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)*, or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Service Interruption

Do not plug your IP Audio Conference Phone 2033 into an ISDN connection. Severe damage can result.

Configuring the IP Audio Conference Phone 2033

Use [Procedure 25 "Configuring the IP Audio Conference Phone 2033" \(page 148\)](#) to configure the IP Phone 2001 for the first time

Procedure 25

Configuring the IP Audio Conference Phone 2033

Step	Action
1	Configure a virtual loop on the system using LD 97. For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i> .
2	Configure the IP Audio Conference Phone 2033 on the system using LD 11. At the prompts, enter the following: REQ:chg TYPE:2033 TN cc uu ECHG yes ITEM cls ITEM For more information about configuring the IP Audio Conference Phone 2033 using LD 11, see <i>Software Input Output Administration (NN43001-611)</i> .
3	Connect one end of the CAT5 Ethernet cable to the network interface located on the back of the Power over Ethernet (PoE) module. See Figure 14 "POE module" (page 149) . Plug the other end of the CAT5 Ethernet cable into your IP network interface.

- 4 Connect the CAT5 Ethernet cable attached to the PoE module to the IP Phone. Thread the CAT5 Ethernet cable through the channel on the bottom of the IP Phone and plug it into the PoE module port on the IP Phone.
- 5 Connect the AC power adapter (optional) to the power supply port located on the back of the PoE module. Leave the AC power adapter unplugged from the power outlet. Thread the cord through the channel on the bottom of the PoE module then plug the other end into the AC power source. Ensure you use the correct AC power transformer. The voltage rating of the transformer must match the wall outlet voltage. See [Table 16 "Components list for US, CA, CALA, AP, and GC" \(page 144\)](#) or [Table 17 "Components list for EMEA" \(page 145\)](#).

[Figure 14 "POE module" \(page 149\)](#) shows the Power over Ethernet (PoE) module.

Figure 14
POE module

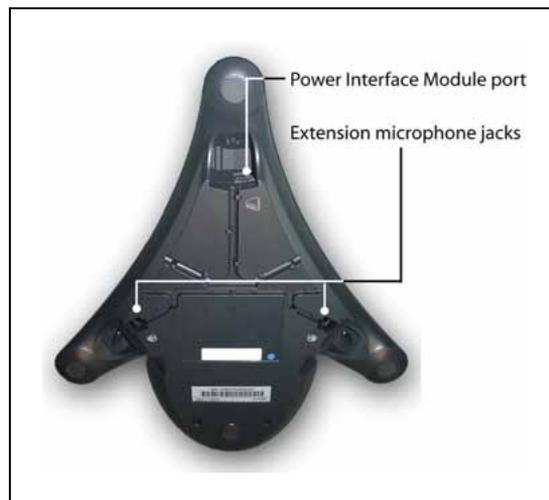


Red LEDs on the IP Audio Conference Phone 2033 indicate power. Messages indicating system start up, such as Loading, Initializing network, and Loading boot parameters appear after a short delay.

[Figure 15 "Bottom view of IP Audio Conference Phone 2033" \(page 150\)](#) shows the bottom view of the IP Audio Conference Phone 2033.

The IP Audio Conference Phone 2033 supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 0. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

Figure 15
Bottom view of IP Audio Conference Phone 2033



—End—

Startup sequence

When an IP Audio Conference Phone 2033 connects to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 19 "IP Audio Conference Phone 2033 IP parameters"](#) (page 150) for a summary of the IP parameters and how they are obtained.

Table 19
IP Audio Conference Phone 2033 IP parameters

Parameter	Method of Acquisition
VLAN ID	Manually entered or automatically obtained through DHCP.
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Address	Manually entered or automatically retrieved through Partial or Full DHCP.

Parameter	Method of Acquisition
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Installing the IP Audio Conference Phone 2033

To install the IP Audio Conference Phone 2033, use [Procedure 26 "Installing the IP Audio Conference Phone 2033 for the first time using manual configuration"](#) (page 151), or [Procedure 27 "Installing an IP Audio Conference Phone 2033 for the first time using DHCP"](#) (page 158).

ATTENTION

Timing information

When you see the text Nortel, you have 1 second to respond by pressing the three soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Audio Conference Phone 2033 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the Local diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities"](#) (page 465).

A tone sounds shortly before the IP Phone is ready to start the Nortel IP Phone application. Once the application has loaded and started, the Nortel logo and Starting DHCP appears at the bottom of the screen.

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 26

Installing the IP Audio Conference Phone 2033 for the first time using manual configuration

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the three soft keys at the bottom of the display in sequence from left to right.

- 2 At the prompt, DHCP *Yes/NO?*, enter 0 (0 for **No**).

By default, Full DHCP is configured on the IP Audio Conference Phone 2033. Depending on the configuration requirements, you can change the IP Audio Conference Phone 2033 configuration to allow the following IP address assignments:

- Static—enter all parameters
- Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server
- Full DHCP— (default) all parameters are obtained from the DHCP server

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.

For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 3 Enter the following information:

Screen prompt	Description
set IP	a valid IP Audio Conference Phone 2033 IP address
net msk	a subnet mask
def g w	the default Gateway for the IP Audio Conference Phone 2033 on the LAN segment to which it connects.

The TFTP Server is required to download the current firmware. For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#)

- 4 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2):

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address of the IP Audio Conference Phone 2033.
S1 Port	This is a fixed value: 4100.

Screen prompt	Description
S1 action	<p>Choose one of the following:</p> <ul style="list-style-type: none"> • for TPS only, enter 1. • for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	<p>The number of times the IP Audio Conference Phone 2033 attempts to connect to the server. Enter 10.</p>
S1 PK	<p>Default is ffffffffffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
S2 IP	<p>The secondary CS 1000 node IP address of the IP Audio Conference Phone 2033.</p>
S2 Port	<p>Same as S1.</p>
S2 action	<p>Same as S1.</p> <p>You are not prompted for S2 PK if S2 Action is set to 1.</p>
S2 retry count	<p>Same as S1.</p>

Screen prompt	Description
S2 PK	<p>Default is ffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>
802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Voice VLAN? (0-N, 1-Y)	<p>Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.</p>
VLAN Cfg? 0-Auto, 1-Man:	<p>Default 0 (for Auto).</p> <p>You are not prompted for VLAN Cfg if Voice VLAN is not enabled.</p> <p>0-Auto Automatically obtains VLAN ID using DHCP or the 802.1ab data switch.</p>

Screen prompt	Description
LLDP-MED? (0-No, 1-Yes)	<p>1-Man Enter the VLAN ID manually. This is a number from 1 to 4094.</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV.</p> <p>You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p>
LLDP VLAN? (0-No, 1-Yes)	<p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.</p> <p>You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.</p>
DHCP (0-No, 1-Yes)	<p>If you select 1-Y (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.</p> <p>You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.</p>
VLANFILTER (0-N, 1-Y)	<p>Default 0 (for No).</p> <p>You are not prompted for VLANFILTER if VLAN is not enabled.</p>
Ctrl pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Ctrl pBits if 802.1Q is not enabled.</p>
Media pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Media pBits if 802.1Q is not enabled.</p>
PCUntagAll? (0-N, 1-Y)	<p>Default 0 (for No).</p>
GARP Ignore? (0-No,1-Yes)	<p>Default 0 (for No).</p>

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Audio Conference Phone 2033 searches for the TFTP Server for firmware upgrade. If the file name specified in i2033.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Audio Conference Phone 2033 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Audio Conference Phone 2033 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Audio Conference Phone 2033 searches for the connect server.

5 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password.
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.
Node	The node ID.
TN	The TN or VTN.

Select the **Shift** soft key labeled (>>) and press **Clear** to edit the TN field. The IP Audio Conference Phone 2033 by default places you in the units field of the TN. You can not use backspace to move to the loop, shelf or card fields.

The IP Audio Conference Phone 2033 registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Audio Conference Phone 2033 resets.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 6 Check for a dial tone and the correct DN above the display.
- 7 (Optional) Customize the soft keys as required. For more information, see *Software Input Output Administration (NN43001-611)* and *IP Phone Audio Conference Phone 2033 User Guide (NN43111-100)*.

—End—

ATTENTION

Timing information

When you see the text Nortel, you have 1 second to respond by pressing the three soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Audio Conference Phone 2033 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities"](#) (page 465).

A tone sounds shortly before the IP Phone is ready to start the Nortel IP Phone application. Once the application has loaded and started, the Nortel logo and **Starting DHCP** appears at the bottom of the screen.

To edit network configuration, the following soft keys are available:

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 27**Installing an IP Audio Conference Phone 2033 for the first time using DHCP****Step Action**

- | Step | Action |
|------|---|
| 1 | When the Nortel logo appears in the middle of the display, immediately press the three soft keys at the bottom of the display in sequence from left to right. |
| 2 | <p>At the prompt DHCP Yes/No?, enter 1 (1 for Yes).</p> <p>By default, Full DHCP is configured on the IP Audio Conference Phone 2033. Depending on the configuration requirements, you can change the IP Audio Conference Phone 2033 configuration to allow the following IP address assignments:</p> <ul style="list-style-type: none"> • Static—enter all parameters • Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server • Full DHCP— (default) all parameters are obtained from the DHCP server <p>A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.</p> <p>For more information about how to set up DHCP servers for use with the IP Phones, see <i>Converging the Data Network with VoIP Fundamentals (NN43001-260)</i>.</p> |
| 3 | At the prompt, Cached IP? , select 0 (0-No, default) to conform to the DHCP standard and to obtain an IP address from the DHCP server. Only select 1 (1 for Yes) to force the IP Phone to start with a cached IP address if the IP Phone cannot connect to the DHCP server and obtain an IP address. |
| 4 | <p>Select Partial or Full DHCP.</p> <p>a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server:</p> <ul style="list-style-type: none"> • a valid IP Audio Conference Phone 2033 IP address • a subnet mask • the default Gateway for the IP Audio Conference Phone 2033 on the LAN segment to which it connects • the S1 IP (the primary CS 1000 node IP address of the IP Phone) • the S1 action |

- the S1 retry count (this is the number of times the IP Audio Conference Phone 2033 attempts to connect to the server)
 - the S2 IP (the secondary CS 1000 node IP address of the IP Phone)
 - the S2 action
 - the S2 retry count
- b. If you select Partial DHCP, then you must enter the following parameters

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address of the IP Audio Conference Phone 2033.
S1 Port	this is a fixed value: 4100.
S1 action	Choose one of the following: <ul style="list-style-type: none"> • for TPS only, enter 1. • for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	the number of times the IP Audio Conference Phone 2033 attempts to connect to the server; enter 10.

Screen prompt	Description
S1 PK	<p>Default is ffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects.</p> <p>If you are using an Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
S2 IP	The secondary CS 1000 node IP address of the IP Audio Conference Phone 2033.
S2 Port	same as S1.
S2 action	<p>same as S1.</p> <p>You are not prompted for S2 PK if S2 Action is set to 1.</p>
S2 retry count	same as S1.
S2 PK	<p>Default is ffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using an Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.

Screen prompt	Description
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).
5 Enter the following parameters:	
802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Voice VLAN (0-N, 1-Y)	<p>Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.</p>
VLAN Cfg? (0-Auto, 1-Man)	<p>Default 0 (for Auto). 0-Auto Automatically obtains VLAN ID using DHCP, or the 802.1ab data switch.</p> <p>1-Man Enter the VLAN ID manually. This is a number from 1 to 4094.</p> <p>You are not prompted for VLAN Cfg if Voice VLAN is not enabled.</p>

LLDP-MED? (0-N, 1-Y)	<p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV.</p>
LLDP VLAN? (0-No, 1-Yes)	<p>You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p> <p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.</p>
DHCP (0-No, 1-Yes)	<p>You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.</p> <p>Default 0 (for No).</p> <p>If you select 1 (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.</p>
VLANFILTER (0-No, 1-Yes)	<p>You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled.</p> <p>Default 0 (0 for No).</p> <p>You are not prompted for VLANFILTER if VLAN is not enabled.</p>
Duplex? (0-Auto, 1-Full)	<p>Default 0 (for Auto).</p>
Ctrl pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Ctrl pBits if 802.1Q is not enabled.</p>
Media pBits (0-7, 8-Au)	<p>Default 8 (for Auto).</p> <p>You are not prompted for Media pBits if 802.1Q is not enabled.</p>
PCUntagAll? (0-N, 1-Y)	<p>Default 0 (for No).</p>

PSK SRTP? (0 for No, 1 for Yes) Default 0 (for No).
 GARP Ignore? (0-No,1-Yes) Default 0 (for No).

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Audio Conference Phone 2033 searches for the TFTP Server for firmware upgrade. If the file name specified in i2033.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Audio Conference Phone 2033 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Audio Conference Phone 2033 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Audio Conference Phone 2033 searches for the connect server.

6 Enter the following information:

Screen prompt	Description
Password	IP Phone Installer Password.
	You are not prompted to enter the IP Phone Installer Password if it has not been configured in your system.

Screen prompt	Description
Node	The node ID.
TN	The TN or VTN.

Select the **Shift** soft key labeled (>>) and press **Clear** to edit the TN field. The IP Audio Conference Phone 2033 by default places you in the units field of the TN. You can not use backspace to move to the loop, shelf or card fields.

The IP Audio Conference Phone 2033 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When the download is complete, the IP Audio Conference Phone 2033 resets.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 7 Check for a dial tone and the correct DN above the display.
- 8 (Optional) Customize the soft keys as required. For more information, see *Software Input Output Administration (NN43001-611)* and *IP Phone Audio Conference Phone 2033 User Guide (NN43111-100)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing the duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 28 "Enable Full Duplex mode" \(page 165\)](#) to enable Full Duplex mode.

Procedure 28
Enable Full Duplex mode

Step	Action
1	Reset the IP Phone by disconnecting and reconnecting power.
2	When the Nortel logo appears, press each soft key in sequence. See Procedure 27 "Installing an IP Audio Conference Phone 2033 for the first time using DHCP" (page 158) .
3	If no other configuration changes are required, press the OK soft key repeatedly until the Duplex network option appears.
4	Select 1 to enable Full Duplex mode.
5	When the Speed option appears, select one of the following: <ul style="list-style-type: none"> • 0 for 10 Mb/s • 1 for 100 Mb/s (default)
6	Select OK to confirm the change.
7	Restart the IP Phone. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 29 "Checking Ethernet Statistics" \(page 165\)](#) to confirm activation of Full Duplex mode.

Procedure 29
Checking Ethernet Statistics

Step	Action
1	Click the Services key. The Network Diagnostics menu appears.
2	Select Telephone Op > Diagnostics > Ether Stats . <ul style="list-style-type: none"> • If Full Duplex mode is active, the following is displayed: — Duplex: Full

- Speed: 10 (Mb) or 100(Mb)
- Auto-Negotiate Capability: N
- Auto-Negotiate Completed: N

—End—

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Redeploying an IP Audio Conference Phone 2033

You can redeploy an existing previously configured IP Audio Conference Phone 2033 on the same system. For example, the IP Audio Conference Phone 2033 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Audio Conference Phone 2033. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 30

Changing the TN of an existing IP Audio Conference Phone 2033

Step	Action									
1	<p>Repower the IP Audio Conference Phone 2033.</p> <p>During the reboot sequence of a previously configured the IP Audio Conference Phone 2033 displays the existing node number for approximately five seconds.</p>									
2	<p>If the node password is enabled and NULL, choose one of the following:</p> <ol style="list-style-type: none"> a. Disable the password. b. Set the password as non-NULL. 									
3	<p>Press OK when the node number displays.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">If</td> <td style="width: 30%;"></td> <td style="width: 30%;">Then</td> </tr> <tr> <td>the node password is enabled and is not NULL</td> <td></td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td></td> <td>a TN screen displays. Go to Step 5.</td> </tr> </table>	If		Then	the node password is enabled and is not NULL		a password screen displays. Go to Step 4 .	the node password is disabled		a TN screen displays. Go to Step 5 .
If		Then								
the node password is enabled and is not NULL		a password screen displays. Go to Step 4 .								
the node password is disabled		a TN screen displays. Go to Step 5 .								

- a. Disable the password.
- b. Set the password as non-NULL.

- 4 Enter the password at the password screen, and press **OK**.
A TN screen displays.
To obtain the password, enter the nodePwdShow command in Element Manager. For further information, see *Element Manager System Reference—Administration (NN43001-632)*.
- 5 Select the **Shift** soft key labeled (>>) and press **Clear** to edit the TN field. The IP Audio Conference Phone 2033 by default places you in the units field of the TN. You cannot use backspace to move to the loop, shelf or card fields.
- 6 Enter the new TN.

—End—

Replacing an IP Audio Conference Phone 2033

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Audio Conference Phone 2033 that currently uses the TN.

Procedure 31

Replacing an IP Audio Conference Phone 2033

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Audio Conference Phone 2033 that you want to replace.
3	Follow Procedure 25 "Configuring the IP Audio Conference Phone 2033" (page 148) and Procedure 26 "Installing the IP Audio Conference Phone 2033 for the first time using manual configuration" (page 151) or Procedure 28 "Enable Full Duplex mode" (page 165) to install and configure the IP Audio Conference Phone 2033.
4	Enter the same TN and Node Number as the IP Audio Conference Phone 2033 you replaced. The system associates the new IP Audio Conference Phone 2033 with the existing TN.

—End—

Removing an IP Audio Conference Phone 2033 from service

Procedure 32

Removing an IP Audio Conference Phone 2033 from service

Step	Action
------	--------

- | | |
|---|---|
| 1 | Disconnect the IP Audio Conference Phone 2033 from the network or turn off the power. |
|---|---|

If the IP Audio Conference Phone 2033 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- | | |
|---|---------------------------------------|
| 2 | In LD 11, enter OUT at the TN prompt. |
|---|---------------------------------------|
-

—End—

Connecting an extension microphone

Procedure 33

Connecting an extension microphone to the IP Audio Conference Phone 2033

Step	Action
------	--------

- | | |
|---|--|
| 1 | Thread the microphone cord through the channels on the bottom of the IP Phone. |
|---|--|

A maximum of two microphone jacks are supported on the IP Audio Conference Phone 2033.

- | | |
|---|---|
| 2 | Connect the microphone cord to one of the microphone jacks on the bottom of the IP Phone. |
|---|---|
-

—End—

Nortel IP Phone 2007

Contents

This section contains the following topics:

- "Introduction" (page 169)
- "Description" (page 170)
- "Components and functions" (page 171)
- "Supported features" (page 174)
- "Features not currently supported" (page 176)
- "Touch panel" (page 176)
- "Dialpad entry" (page 177)
- "Cleaning the IP Phone display screen" (page 178)
- "Display characteristics" (page 178)
- "Local Tools menu password protection" (page 181)
- "Key number assignments" (page 183)
- "Package components" (page 183)
- "Installation and Configuration" (page 185)
- "Full Duplex mode" (page 198)
- "Gratuitous Address Resolution Protocol Protection" (page 199)
- "Extensible Authentication Protocol" (page 200)
- "Redeploying an IP Phone 2007" (page 200)
- "Replacing an IP Phone 2007" (page 201)
- "Removing an IP Phone 2007 from service" (page 201)

Introduction

This section explains how to install and maintain the IP Phone 2007. For information about using the IP Phone 2007, see the *IP Phone 2007 User Guide (NN43118-100)*.

This section contains the following procedures:

- Procedure 34 "Configuring the IP Phone 2007" (page 186).
- Procedure 35 "Installing the IP Phone 2007" (page 189).
- Procedure 36 "Enabling Full Duplex mode" (page 198).
- Procedure 37 "Checking Ethernet Statistics" (page 199).
- Procedure 38 "Changing the TN of an existing IP Phone 2007" (page 200).
- Procedure 39 "Replacing an IP Phone 2007" (page 201).
- Procedure 40 "Removing an IP Phone 2007 from service" (page 201).

After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Phone 2007 uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 2007 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 2007 network connection, and Communication Server 1000 connection.

Figure 16 "IP Phone 2007" (page 170) shows the IP Phone 2007.

Figure 16
IP Phone 2007



Components and functions

This section describes the following components and functions of the IP Phone 2007:

- Keys and functions
- Services menu
- Local Tools menu

Keys and functions

[Table 20 "IP Phone 2007 keys and functions" \(page 171\)](#) lists the keys and functions for the IP Phone 2007.

Table 20
IP Phone 2007 keys and functions

Key	Function
Hold	Press the Hold key to put an active call on hold. Tap the flashing line (DN) soft key to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Handsfree	Press the Handsfree key to activate handsfree.
Headset	The LED lights to indicate when the handsfree feature is active. Press the Headset key to answer a call using the headset or to switch a call from the handset or handsfree to the headset.
Mute	Press the Mute key to listen to the receiving party without transmitting. Press the Mute key again to return to a two-way conversation. The Mute key applies to handsfree, handset, and headset microphones.
Volume control bar	The Mute LED flashes when the Mute option is in use. Use the Volume control bar to adjust the volume of the ringer, handset, headset, speaker, and the Handsfree feature.
Message waiting light/incoming call indicator	Press the right side of the rocker bar to increase volume, the left side to decrease volume. The Message waiting indicator turns ON to indicate that a message has been left for the user. This indicator also flashes when the set ringer is ON.

Key	Function
Programmable line (DN)/feature keys (self-labeled)	<p>Programmable line (DN)/feature keys (self-labeled) are located on the touch panel display and are configured for various features on the IP Phones.</p> <p>A steady LCD light beside a programmable line (DN)/feature key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.</p>
Context-sensitive soft keys (self-labeled)	<p>Context-sensitive soft keys (self-labeled) are located on the touch panel display. The soft key label changes, based on the active feature.</p> <p>Tap the More soft key to access the next layer of soft key functions.</p>
Navigation keys	<p>Use the navigation keys to scroll through menus and lists on the LCD display screen. The key rocks for up, down, left, and right movement.</p>
Context-sensitive keys	<p>The soft key labels are enabled for the keys on either side of the navigation cluster. The labels are context sensitive. When in an edit box, the soft key labels appear as Clear and Backspace. This allows numeric editing without using the soft keyboard. In normal use the soft key labels show Quit and Copy.</p>

Services menu

Table 21 "Services menu" (page 172) shows the Services menu.

Table 21
Services menu

Services key	<p>Tap the Services key to access the following items:</p> <ul style="list-style-type: none"> • Volume adjustment • Contrast adjustment • Language • Date/Time • Display diagnostics • Local DialPad Tone • Set Info • Diagnostics • Call Log Options • Ring type • Call timer • On hook default path • Change Feature key label
--------------	---

- Name Display Format
- Live Dialpad

- Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)
- Test Local Mode and Resume Local Mode (if Branch Office is configured)
- Password Admin (if configured)

When an option has a sublist, an ellipsis (...) appears after the option.

Double-press the Services key to access Network diagnostic utilities. For more information about Network diagnostic utilities, see [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

Local Tools menu

Tap the Tools icon to access the Local Tools menu. [Table 22 "Local Tools menu" \(page 173\)](#) shows the options available in the Local Tools menu.

If you are prompted to enter a password when you tap the Tools icon, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 181\)](#).

Entering text in the Local Tools menu items is easier with a USB keyboard.

Table 22
Local Tools menu

Network Configuration	<p>Use this menu to configure the IP Phone 2007, or to display the information that was configured when the IP Phone was installed. This menu contains the following items:</p> <ul style="list-style-type: none"> • 802.1x/EAP • DHCP status • IP network settings (IP address, mask, gateway address) • Server 1 and Server 2 IP address, Port, Action, Retry, and PK numbers • Voice VLAN and Filtering • PC port disable • Data VLAN and Filtering • Duplex setting • Ignore GARP protection • Pre-Shared Key S RTP
-----------------------	---

Local Diagnostics	<ul style="list-style-type: none"> • XAS (S4) IP address, graphical, port <p>Displays the Local Diagnostics menu containing the following items:</p> <ul style="list-style-type: none"> • Network Diagnostic Tools • Ethernet Statistics • IP Network Statistics • IP Set&DHCP Information <p>For more information about the IP Phone 2007 Local Diagnostics menu, see Appendix "IP Phone diagnostic utilities" (page 465).</p>
Touch Panel Setup	Use the Touch Panel Setup tool to calibrate the touch panel and stylus.
Contrast and Brightness	Use Contrast Brightness tools to alter the display physical settings.
USB Devices	Use USB Devices menu to control the Universal Serial Bus (USB) device plugged into the USB port in the back of the IP Phone.
TFTP Upgrade	Use TFTP Upgrade menu to upgrade the firmware in the IP Phone.
Preferences	Use the Preferences menu to configure individual user preferences.
Lock Menu	Use the Lock menu to prevent unauthorized access to the Local Tools menu.

Supported features

- 12 programmable line (DN)/feature soft keys
- four context-sensitive soft keys (self-labeled) that provide access to a maximum of nine features
 - Functions for the context-sensitive soft keys are configured in LD 11.
- large, color touch panel display screen
- volume control bar to adjust ringer, speaker, handset, and headset volume
- speaker for on-hook dialing or on-hook listening
- four call-processing fixed keys:
 - Hold
 - Goodbye
 - Handsfree
 - Mute

- Call Duration Timer
- ability to change the programmable line (DN)/feature key labels
Feature keys support English characters only.
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 2007 supports the following data networking features:

- integrated switch for shared PC access
 - the LAN Ethernet port supports 10/100BT Mb/s Full Duplex mode
 - the PC Ethernet port supports 10/100BT Mb/s Full Duplex mode
- automatic network configuration through DHCP
For more information about automatic network configuration, see [Table 25 "IP Phone 2007 IP parameters" \(page 188\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP)
For more information about LLDP, [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption
For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).
- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone; allows VLAN and priority tagging for the IP Phone traffic and VLAN tagging for PC traffic
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching

the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN

For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 3
- Gratuitous Address Resolution Protocol (GARP) Protection

The IP Phone 2007 supports the following user interface features:

- a large, color touch panel display that supports color XML/HTML content through an XAS
- USB port, to support USB devices
Powered downstream 1.1 compliant USB hubs are supported, including USB 2.0 hubs, if they offer USB 1.1 backwards compliancy.
- Hearing Aid Compatibility (HAC) as per FCC Part 68
- headset jack with On/Off key
- remote firmware download
- TFTP Server based firmware upgrades
- language support: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, and Turkish
- External Application Server (XAS)
- Graphical External Application Server (GXAS)

Features not currently supported

The following features are not supported on the IP Phone 2007:

- Group Listening
- Set-to-Set messaging

Touch panel

You perform point and click operations on your IP Phone 2007 using the touch panel. The touch panel is used with the graphical user interface (GUI) to present soft keys directly on the display. You can activate all Line/DN keys and feature soft keys by using the touch panel.

Calibrate the touch panel

Calibrate the touch panel through the Tools menu, which enables you to fine-tune the touch panel. You are prompted to use the stylus to tap three targets.

For further information, see [Procedure 34 "Configuring the IP Phone 2007" \(page 186\)](#).

Stylus

Operate the touch panel using a stylus or your finger. However, use of a stylus is recommended to avoid damage to the touch panel.

Dialpad entry

For ease of use, Nortel recommends the use of the external USB keyboard.

The following rules apply when you enter text and special characters using the dialpad.

- Press a key from 0 to 9 once to enter the corresponding number.
- Press a key from 2 to 9 repeatedly to cycle through the letters assigned to that key, first in lower case and then in upper case.

For example, if you press the **5** key repeatedly, the following characters are displayed, one at a time:

j -> k -> l -> J -> K -> L -> 5 ->

See [Table 23 "Character key mappings" \(page 177\)](#) for character key mappings.

- The insertion point remains in the its current position as long as you continue to press the same key.
- The entry is accepted if either a new key is pressed or if two seconds pass with no entry. The insertion point moves 1 space to the right.

For example, to enter the word Nortel, press the following key sequence:

6 [2 second delay] 6 7 8 3 5

Although special characters are not required, key 1 generates commonly used special characters, such as the period (.), at symbol (@), and underscore (_).

Table 23
Character key mappings

Key	Generates
1	_ - . ! @ \$ % & + 1
2	a b c A B C 2

Key	Generates
3	d e f D E F 3
4	g h i G H I 4
5	j k l J K L 5
6	m n o M N O 6
7	p q r s P Q R S 7
8	t u v T U V 8
9	w x y z W X Y Z 9

Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

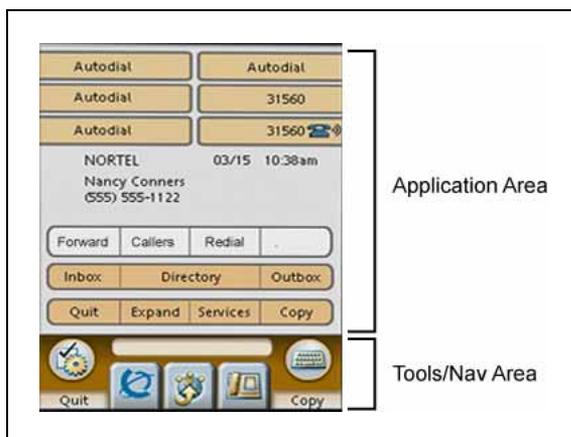
Display characteristics

The IP Phone 2007 window-based user interface has two display areas:

- Application area
- Tools and Navigation area

Figure 17 "IP Phone 2007 display areas" (page 178) shows these two display areas.

Figure 17
IP Phone 2007 display areas



The display may differ from the above example.

To extend the life of the LCD panel, the panel goes dark (sleep) after a configured period of time. For further information, see the *IP Phone 2007 User Guide (NN43118-100)*.

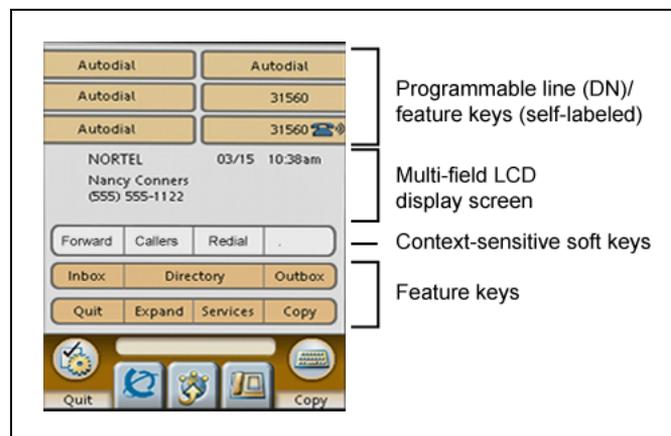
Application area

The Application area provides:

- line and feature key status
- information line display
 - caller number
 - caller name
 - feature prompt strings
 - user-entered digits
 - date and time information or Call Timer (if provisioned in the Telephone options menu)
 - set information
- feature keys
- soft keys

Figure 18 "IP Phone 2007 Application area" (page 179) shows the Application area.

Figure 18
IP Phone 2007 Application area



Programmable line (DN)/feature key label display

The feature key label area displays a 10-character string for each of the 12 programmable line (DN)/feature keys. Each key includes the key label and an icon. The icon state can be on, off, or flashing. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen.

If a label is longer than 10 characters, the last 10 characters are displayed, and the excess characters are deleted from the beginning of the string.

Soft key label display

Use the More key to navigate through the layers of functions. If only four functions are assigned to the soft keys, the More key does not appear, and all four functions are displayed.

The soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a soft key is enabled, the icon state changes to on. It remains in the on state until the soft key is pressed again. This cancels the enabled soft key and turns the icon off, returning the soft key label to its original state.

Soft key labels support different languages.

Feature key label display

The feature key labels may show either text or icons. The text labels are displayed by default and are changed using the Tools menu. For further information about the feature keys and their icon equivalents, see the *IP Phone 2007 User Guide (NN43118-100)*.

Tools/Navigation area

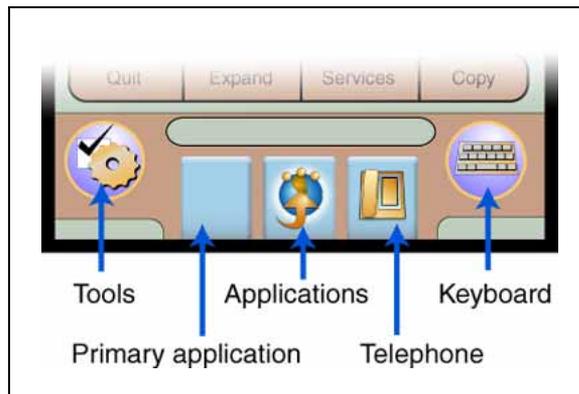
The Tools/Navigation area provides controls for navigating between features and selecting tools.

The following five main elements are presented as touchable keys:

- Tools
- Primary application
- Applications
- Telephone
- Keyboard

Figure 19 "IP Phone 2007 Tools/Navigation area" (page 181) shows the Tools/Navigation area.

Figure 19
IP Phone 2007 Tools/Navigation area



Local Tools menu password protection

If the SECUREMENU parameter was set during Full DHCP configuration, the Local Tools menu is locked to prevent accidental or unwanted changes. You are prompted to enter the fixed password 26567*738 (color*set) whenever the Services key is double-pressed, or whenever the Local Diagnostics and Network Configuration sub menus are accessed.

If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access Local Diagnostics, or Network Configuration menu items from the Local Tools menu. You are always prompted to enter the fixed password whenever you access the Lock Menu sub menu.

Two ways to control the menu lock are as follows:

- DHCP Secure Menu option—the IP Phone processes the secure menu setting retrieved from the Full DHCP response.
- Lock Menu option—double-press the Services key to access the Local Tools menu. Use the up/down navigation keys to scroll and highlight one of the following Lock Menu options:
 - 1. Manual Secure Local Menu—You are prompted to enter the fixed password whenever the Services key is double-pressed.
 - 2. Manual Partial Secure Menu—You are prompted to enter the fixed password whenever you access the Local Diagnostics and the Network Configuration sub menus.
 - 3. Manual Disable Secure Menu—When this option is selected, the Lock Menu is disabled.
 - 4. DHCP Secure Menu—The IP Phone follows the menu lock configuration received from the Full DHCP string:
 - If SECUREMENU is present, you are prompted to enter a password after you double-press the Services key.

- If PARTSECURE is present, you are prompted to enter a password whenever you select Local Diagnostics and Network Configuration.
 - If neither SECUREMENU nor PARTSECURE is present, then the menu is not locked.
- 5. Lock Now—The Lock Now item immediately exits the Tools menu, closes any open Tools menu pages, and locks the Tools menu.

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

Configuring Secure Local Menu through Full DHCP

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECURE parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECURE parameter is present, password protection is not enabled.

The SECUREMENU/PARTSECURE item is an optional parameter. If it is present, then the full S4 string needs to be present, including the action and retries. The S4 string is already present if the XAS support has been configured through the DHCP. If XAS is not configured, you can still enable password protection by setting the S4 IP address to 0.0.0.0 and by setting the other fields to 0.

ATTENTION

With Full DHCP, the vendor-specific or site-specific options must be configured depending on the customers DHCP server configuration.

For further information about configuring Full DHCP, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Accessing the Local Tools menu

After you enter the password, the Local Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Local Tools menu without being prompted to reenter the password. To reset the timer before the 5-minute time expires, double-press the Services key.

You can also press the 5 key to select the Lock Now item from the Lock Menu. The Lock Now item immediately exits the Local Tools menu, closes any open Local Tools menu pages, and locks the Local Tools menu. Alternatively, when time expires, the Local Tools menu and any open submenus are closed. Double-press the Services key to open the password prompt window to reaccess the Local Tools menu.

If you enter an incorrect password, the Local Tools menu does not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5-minute time expires.

Some text appears dimmed depending on the current state of the menu lock and the configuration of the IP Phone. Only configuration options that are enabled from the current state appear active. Menu options that are not available appear dimmed.

For more information about configuring the Local Tools menu for the IP Phone 2007, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined context-sensitive soft keys. Because the context-sensitive soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the context-sensitive soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four context-sensitive soft keys. Labels for the context-sensitive soft keys appear in the display area. For further information, see ["Soft key label display" \(page 180\)](#). [Figure 18 "IP Phone 2007 Application area" \(page 179\)](#) shows the IP Phone 2007 Application area.

For a description of the IP Phone function assignment for each of the context-sensitive soft keys, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The IP Phone 2007 includes integrated support for a number of LAN options, including support for IEEE 802.3af Power Classification 3. The Global power adapter must be ordered separately if local power is required.

Table 24 "IP Phone 2007 component list" (page 184) lists the IP Phone 2007 package components and product codes. Contact Nortel for further information.

Table 24
IP Phone 2007 component list

IP Phone 2007 package contents includes	NTDU96AB70
<ul style="list-style-type: none"> • IP Phone 2007 (charcoal with metallic bezel) • Handset • Handset cord • Footstand • 7-ft. (2.1 m) CAT5 Ethernet cable • Getting Started card 	
Replacement parts	
7-ft. CAT5 Ethernet cable	A0648375
Handset (charcoal)	A0758634
Handset cord (charcoal)	N0000764
Footstand (charcoal)	A0538587
IP Phone 2007 power adapter	
Global power adapter	N0014020
IP Phone 2007 power cords	
Cord 9.9 ft. NA Power, NEMA, 125 Vac 13 ^a NA, M.East, Taiwan, Indonesia, Philippines, Korea, Thailand, Vietnam, Japan	NTTK14AB
Cord 8 ft., ANA Power AS-3, 240 Vac 10A Australia, New Zealand, PRC	NTTK15AA
Option 11C Standard European Power Cord 250 Vac Other EMEA, Kenya	NTTK16AB
Option 11C Swiss Power Cord, 9.9 ft. 125 Vac Switzerland	NTTK17AB
Option 11C UK Power Cord 240 Vac Hong Kong, Ireland, UK, Singapore, Malaysia, India, Bangladesh, Pakistan, Brunei, Sri Lanka	NTTK18AB
Option 11C Denmark Power Cord Kit, 9.9 ft. 125 Vac Denmark	NTTK22AB

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 2007:

- Before you begin
- First-time installation
- Configuring the IP Phone 2007
- Startup sequence
- Installing the IP Phone 2007

Before you begin

Before installing the IP Phone 2007, complete the following pre-installation checklist:

- Ensure one IP Phone 2007 boxed package exists for each IP Phone 2007 being installed. The package contains:
 - IP Phone 2007
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - Getting Started Card
- Ensure 1 Software License exists for each IP Phone 2007 being installed.
- Ensure the host Call Server is equipped with a Signaling Server that runs the Line TPS application.
- If you are not using Power over Ethernet (PoE) you must use the Global power adapter or your phone fails to operate. See [Table 24 "IP Phone 2007 component list" \(page 184\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*



CAUTION

Damage to Equipment

Do not plug your IP Phone 2007 into an ISDN connection. Severe damage can result.

Configuring the IP Phone 2007

Procedure 34

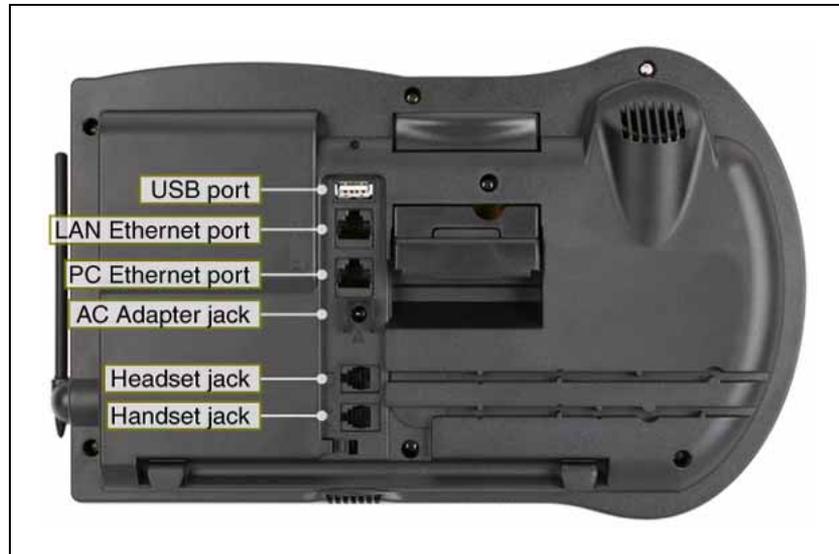
Configuring the IP Phone 2007

Step	Action
1	<p>Configure a virtual loop on the system using LD 97.</p> <p>For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i>.</p>
2	<p>Configure the IP Phone 2007 on the system using LD 11. At the prompt, enter the following:</p> <pre>REQ:chg TYPE:2007</pre> <p>To configure the IP Phone 2007 using LD 11, see <i>Software Input Output Administration (NN43001-611)</i>.</p>
3	<p>Connect the IP Phone 2007 components:</p> <ol style="list-style-type: none"> Connect one end of the handset cord to the handset jack on the back of the IP Phone (identified with a handset icon). Connect the other end of the handset cord to the handset.
4	<p>Choose one of the following connections:</p> <ul style="list-style-type: none"> For an IP Phone not sharing a LAN access with a PC: <p>Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone (identified with a LAN icon). Plug the other end of the CAT5 Ethernet cable into the IP network.</p> For an IP Phone sharing a LAN access with a PC (identified with a PC icon): <p>Connect one end of the CAT5 Ethernet cable to the LAN Ethernet port located on the back of the IP Phone and the other end to the IP network. Insert one end of a second CAT5 Ethernet cable into the PC Ethernet port located on the back of the IP Phone and the other end into the computer Ethernet port.</p>
5	<p>Secure the IP Phone footstand to the base of the IP Phone. Use the angle adjustment grip on the top back of the IP Phone to adjust the position.</p>

**CAUTION****Damage to Equipment**

Do not plug any device into your IP Phone 2007 Ethernet port other than one PC. The IP Phone 2007 does not support multiple devices connected through the PC Ethernet port.

Figure 20
IP Phone 2007 connections



- 6 Power the IP Phone 2007 using either the Power over Ethernet or the Global power adapter (local power).
 - a. To use local power, plug the Global power adapter into the nearest power outlet. See [Table 24 "IP Phone 2007 component list" \(page 184\)](#).
 - b. Connect the power jack as shown in [Figure 20 "IP Phone 2007 connections" \(page 187\)](#).

The IP Phone 2007 supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 2. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

A tone sounds shortly before the IP Phone is ready to start the Nortel IP Phone application.

- 7 Once the application has loaded and started, Nortel appears in the middle of the screen. Immediately press the following keys in sequence:

- a. 0
- b. 0
- c. 7
- d. star (*)

If you miss part of the configuration, unplug the phone from the power for a few seconds and redo this step.



WARNING

If you are using local power, you must use the Global power adapter or your phone fails to operate.

—End—

Startup sequence

When an IP Phone 2007 connects to the network, it must perform a startup sequence. The elements of the startup sequence include:

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 25 "IP Phone 2007 IP parameters" \(page 188\)](#) for a summary of the IP parameters and how they are obtained.

Table 25
IP Phone 2007 IP parameters

Parameter	Method of Acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically retrieved through Partial or Full DHCP.
Net Mask	Manually entered or automatically retrieved through Partial or Full DHCP.
Default Gateway Address	Manually entered or automatically retrieved through Partial or Full DHCP.

Parameter	Method of Acquisition
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically retrieved through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Retrieved from local storage on subsequent power cycles.

Installing the IP Phone 2007

To install the IP Phone 2007, use [Procedure 35 "Installing the IP Phone 2007"](#) (page 189).

ATTENTION

Timing information

There are only four second(s) between plugging in the IP Phone 2007 power adapter and the appearance of Nortel on the display. When Nortel appears in the middle of the screen, you have 1 second to respond by pressing 0, 0, 7, *. If you miss the 1-second response time, the IP Phone 2007 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the network diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities"](#) (page 465).

You can press the **Apply&Reset** soft key at any time to apply the current configuration and reset the phone. You can press the **Exit** soft key to exit the menu without saving any changes and return to the **Network Configuration** menu.

When the Network Configuration menu opens, **Enable 802.1x Auth. (EAP)** is the first option in the list.

Procedure 35

Installing the IP Phone 2007

Step	Action
1	Use the Right navigation key to scroll and highlight the Enable 802.1x Auth. (EAP): list box.
2	Press the Down navigation key to open list box.
3	Use the Up/Down navigation keys to scroll and highlight Yes to enable 802.1x Authentication, or No to disable 802.1x Authentication.
4	If 802.1x Authentication is enabled, use the dialpad to fill in the following information: <ul style="list-style-type: none"> • Device ID • Password • Retype the password

Use the dialpad to enter digits only. To enter alpha characters, use either the IP Phone 2007 pop-up keyboard, or a USB keyboard.

For further information about EAP, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

If you do not enable 802.1x Authentication, you are not prompted to enter Device ID and Password.

- 5 Use the **Right** navigation key to scroll and highlight **Enable 802.1x (LLDP Enable)**.

For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).

- 6 Use the **Up/Down** navigation keys to scroll and highlight **Yes** to enable LLDP, or **No** to disable LLDP.

LLDP is one means in which 801.2 can be automatically provisioned.

For more information about 802.1Q, see [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 7 Use the **Right** navigation key to scroll and highlight **DHCP** list.

- 8 Press the **Down** navigation key to open list box.

- 9 Use the **Up/Down** navigation keys to scroll and highlight one of the following DHCP options:

- No—disable DHCP support and enter IP network information manually.
- Partial—IP network information (IP address, network mask, and gateway address) are provided by the DHCP server. Enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers manually.
- Full—IP network information, Server 1 IP address, Server 2 IP address, and XAS information are provided by the DHCP server. All items are dimmed to prevent manual entry.

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.

For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 10 Use the **Right** navigation key to scroll and highlight **Set IP**. Use the dialpad to fill in the information:

Set IP—a valid IP Phone 2007 IP address

- 11 Use the **Right** navigation key to scroll and highlight **NET MASK**. Use the dialpad to fill in the information:
Network Mask—a subnet mask
- 12 Use the **Right** navigation key to scroll and highlight **Gateway**. Use the dialpad to fill in the information:
Gateway—the default gateway for the IP Phone 2007 on the LAN segment to which it connects
- 13 Use the **Right** navigation key to scroll and highlight **S1 IP**. Use the dialpad to fill in the information:
S1 IP—the primary CS 1000 node IP address for IP Phone 2007
- 14 Use the **Right** navigation key to scroll and highlight **Port**. Use the dialpad to fill in the information:
S1 Port—a fixed value of 4100
- 15 Use the **Right** navigation key to scroll and highlight **S1 Action**. Use the dialpad to fill in the information. Choose one of the following:
 - for TPS only, enter 1
 - for TPS and Secure Media Controller, enter 6 or 1

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.
- 16 Use the **Right** navigation key to scroll and highlight **Retry**. Use the dialpad to fill in the information:
Retry—the number of times the IP Phone 2007 attempts to connect to the server
- 17 Use the **Right** navigation key to scroll and highlight **S1 PK**. Use the dialpad to fill in the information:
S1 PK—the Private key of the Secure Media Controller to which the IP Phone connects
- 18 Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Enter 6 or 1. This value depends on the S1 Action configuration.
- 19 Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffff.

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

- 20** Use the **Right** navigation key to scroll and highlight **S2 IP**. Use the dialpad to fill in the information:
S2 IP—the secondary CS 1000 node IP address for IP Phone 2007
IP Phone 2007 can support a primary (S1) and secondary (S1) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.
- 21** Use the **Right** navigation key to scroll and highlight **Port**. Use the dialpad to fill in the information:
Port—same as S1 port
- 22** Use the **Right** navigation key to scroll and highlight **S2 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following:
- for TPS only, enter 1
 - for TPS and Secure Media Controller, enter 6 or 1
- For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.
- 23** Use the **Right** navigation key to scroll and highlight **Retry**. Use the dialpad to fill in the information:
Retry—same as S1
- 24** Use the **Right** navigation key to scroll and highlight **S2 PK**.
S2 PK— the Private key of the alternate Secure Media Controller to which the IP Phone connects
- 25** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Set the S2 PK to 6 or 1. This value depends on the S2 Action configuration.
Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffff.
- 26** Use the **Right** navigation key to scroll and highlight **Ntwk Port Speed** box. Press the **Down** navigation key to open the list box.
Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- Auto—Link speed is autonegotiated with the network device.
 - 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the network.

- 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the network.
- 27 Use the **Right** navigation key to scroll and highlight **Ntwk Port Duplex** box. Press the **Down** navigation key to open the list box.
- The **Ntwk Port Duplex** option appears dimmed if **Ntwk Port Speed** is set to Auto.
- Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- Auto—Duplex mode is autonegotiated with the network device
 - Force Full—Duplex mode is forced to Full Duplex on the network
 - Force Half—Duplex mode is forced to Half Duplex on the network
- 28 Use the **Right** navigation key to scroll and highlight **Disable Voice 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 29 Use the **Right** navigation key to scroll and highlight **VoiceVLAN** box. Press the **Down** navigation key to open the list box.
- 30 Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- No VLAN
 - DHCP—VLAN ID is configured automatically to one of the values received from the DHCP server
 - LLDP MED—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - Manual
- If LLDP is disabled, LLDP MED and LLDP VLAN Name modes do not appear in the list. If DHCP is disabled, DHCP does not appear in the list.
- 31 Use the **Right** navigation key to scroll and highlight **VLAN Filter** check box.
- VLAN Filter** appears dimmed if **Disable Voice 802.1Q** check box is selected.
- If the VLAN Filter is enabled, packets destined for the IP Phone port are filtered on their MAC address and their VLAN tag. Untagged VLAN packets and tagged VLAN packets that differ from the Telephony VLAN ID are prevented from reaching the IP Phone port.

For information about VLAN tagging, [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 32** Use the **Right** navigation key to scroll and highlight **Ctrl Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- Ctrl Priority Bits** option appears dimmed if **Disable Voice 802.1Q** check box is selected.
- 33** Use the **Right** navigation key to scroll and highlight **Media Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- Media Priority Bits** option appears dimmed if **Disable Voice 802.1Q** check box is selected.
- 34** Use the **Right** navigation key to scroll and highlight **Disable PC Port** check box. Press the **Enter** key to switch this item on and off.
- 35** Use the **Right** navigation key to scroll and highlight **PC Port Speed** box. Press the **Down** navigation key to open the list box.
- Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- Auto—Link speed is autonegotiated with the attached PC
 - 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the PC port
 - 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the PC port
- 36** Use the **Right** navigation key to scroll and highlight **PC Port Duplex** box. Press the **Down** navigation key to open the list box. Use the **Up/Down** navigation keys to scroll and highlight one of the following options:
- Auto—Duplex mode is autonegotiated with the attached PC
 - Force Full—Duplex mode is forced to Full Duplex on the PC
 - Force Half—Duplex mode is forced to Half Duplex on the PC
- PC Port Duplex** appears dimmed if the **PC Port Speed** option is set to Auto.
- 37** Use the **Right** navigation key to scroll and highlight **Disable Data 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 38** Use the **Right** navigation key to scroll and highlight **DataVLAN** box. Press the **Down** navigation key to open the list box.

The **DataVLAN** option appears dimmed if **Disable Data 802.1Q** check box is selected.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options:

- No VLAN
- LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
- VLAN ID value—manual selection of VLAN ID from 1 to 4094

If LLDP is disabled, LLDP VLAN Name does not appear in the list.

- 39** Press the **Enter** key.
- 40** Use the **Right** navigation key to scroll and highlight **Data Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- 41** Use the **Right** navigation key to scroll and highlight **PC-Port Untag All** check box. Press the **Enter** key to switch this item on and off.

The **PC-Port Untag All** option appears dimmed if **Disable Data 802.1Q** check box is selected.

- 42** Use the **Right** navigation key to scroll and highlight **Cached IP** check box. Press the **Enter** key to switch this item on and off.
- 43** Use the **Right** navigation key to scroll to **Enable PSK SRTP**. Select **Yes** to enable SRTP media encryption or select **No** to disable SRTP media encryption.

The SRTP media encryption feature provides encrypted media. A preshared secret is embedded in the Nortel IP Phone to generate and to exchange encryption parameters without any Call Server involvement.

For further information about the SRTP media encryption feature, see "[SRTP media encryption](#)" (page 429) and *Security Management Fundamentals (NN43001-604)*.

- 44** Use the **Right** navigation key to scroll to **Ignore GARP**. Select **Yes** to enable GARP protection, or **No** to disable GARP protection.

The GARP feature protects the IP Phone from a Gratuitous ARP Spoof attack from the network.

For more information about GARP, see "[Gratuitous Address Resolution Protocol Protection](#)" (page 199).

- 45** If an External Application Server (XAS) is available in the network, use the **Right** navigation key to scroll and highlight the **XAS IP** list. Use the dialpad to enter the XAS IP address.

The XAS delivers business applications to the IP Phone. For more information about XAS, see Nortel Application Gateway 1000 documentation.

- 46** Use the **Right** navigation key to scroll and highlight the **Graphical XAS** check box.

- 47** Use the **Right** navigation key to scroll and highlight the **Port** list. Use the dialpad to fill in the information.

- 48** Upgrade the IP Phone 2007 firmware.

The IP Phone 2007 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

The method to upgrade the firmware depends on the following Call Server software:

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt.
- For CS 1000 Release 4.5 or later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2007 searches for the TFTP Server for firmware upgrade. If the file name specified in i2007.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2007 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2007 can support a primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 2007 searches for the connect server.

The IP Phone 2007 registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 2007 resets.

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 49** Check for dial tone and the correct DN above the display.
- 50** (Optional) Customize the feature keys as required. For more information, see the *IP Phone 2007 User Guide (NN43118-100)*.

- 51** Tap the **Tools** icon to calibrate the touch panel and stylus.

- 52** Tap the **Touch Panel Setup** soft key.

The screen displays a calibration map, the **Cancel** soft key is displayed, and the following system prompt is displayed:

```
Touch the center of the red ball.
```

- 53** Use the stylus and tap each of the red dots, in order, starting with the lower left portion of the screen, and following the sequence as prompted.

After the third dot is tapped, the display changes to indicate the result of calibration.

- If the calibration is successful, the IP Phone displays the following report:

```
Data calibration is CORRECT.  
Save Data calibration?
```

YES and **NO** soft keys and calibration statistics are displayed on the screen.

Tap the **YES** soft key to save the calibration settings and exit to the main display or tap the **NO** soft key to abandon the calibration settings and exit to the main display.

- If the calibration is unsuccessful, the IP Phone displays the following report:

```
Data calibration is WRONG.  
Repeat calibration?
```

YES and **NO** soft keys and calibration statistics are displayed on the screen.

Tap the **YES** soft key to retry the calibration or tap the **NO** soft key to abandon the calibration and return to the main display.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing the duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 36 "Enabling Full Duplex mode" \(page 198\)](#) to enable Full Duplex mode.

Procedure 36 Enabling Full Duplex mode

Step	Action
1	Tap the Tools icon.
2	Enter the Tools menu password (if Password protection is enabled). For information about Password Protection, see "Local Tools menu password protection" (page 181) .
3	Tap the Network Configuration menu entry.
4	Use the Right navigation key to scroll and highlight the Duplex list.
5	Press the Down navigation key to open list box.
6	Use the Up/Down navigation keys to scroll and highlight one of the following options: <ul style="list-style-type: none"> • 10BT Full—10 BT Full Duplex mode • 100BT Full—100 BT Full Duplex mode

- 7 Tap the **Apply&Reset** soft key to save the changes and to restart the IP Phone. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 37 "Checking Ethernet Statistics" \(page 199\)](#) to confirm activation of Full Duplex mode.

Procedure 37

Checking Ethernet Statistics

Step	Action
------	--------

- | | |
|---|---|
| 1 | Tap the Tools icon. |
| 2 | Tap the Local Diagnostics soft key. |
| 3 | Tap the Ethernet Statistics soft key.
The following statistics are displayed: <ul style="list-style-type: none"> • Link: Up • Duplex: Full • Speed: 10 (Mb) or 100 (Mb) • Auto-Negotiate Capability: N • Auto-Negotiate Completed: N |

—End—

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection prevents the IP Phone 2007 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. The malicious device launches a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 35 "Installing the IP Phone 2007" \(page 189\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Redeploying an IP Phone 2007

You can redeploy an existing, previously-configured IP Phone 2007 on the same system. For example, the IP Phone 2007 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 2007. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 38

Changing the TN of an existing IP Phone 2007

Step	Action						
1	<p>Repower the IP Phone 2007.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 2007 displays the existing node number for approximately five seconds.</p>						
2	<p>If the node password is enabled and NULL, choose one of the following:</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. 						
3	<p>Press OK when the node number displays.</p> <table border="0"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>the node password is enabled and is not NULL</td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td>a TN screen displays. Go to Step 5.</td> </tr> </tbody> </table>	If	Then	the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .	the node password is disabled	a TN screen displays. Go to Step 5 .
If	Then						
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .						
the node password is disabled	a TN screen displays. Go to Step 5 .						
4	<p>Enter the password at the password screen, and press OK.</p> <p>A TN screen displays.</p> <p>To obtain the password, enter the nodePwdShow command in Element Manager. For further information, see <i>Element Manager System Reference—Administration (NN43001-632)</i>.</p>						

- 5 Select the **Clear** soft key to clear the existing TN.
- 6 Enter the new TN.

—End—

Replacing an IP Phone 2007

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 2007 that currently uses the TN.

Procedure 39

Replacing an IP Phone 2007

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 2007 that you want to replace.
3	Follow Procedure 34 "Configuring the IP Phone 2007" (page 186) to install and configure the IP Phone 2007. Enter the same TN and Node Number as the IP Phone 2007 you replaced. The system associates the new IP Phone 2007 with the existing TN.

—End—

Removing an IP Phone 2007 from service

Procedure 40

Removing an IP Phone 2007 from service

Step	Action
1	Disconnect the IP Phone 2007 from the network or turn the power off. The service to the PC is disconnected as well if the PC connects to the IP Phone 2007. If the IP Phone 2007 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.
2	In LD 11, enter OUT at the TN prompt.

—End—

IP Phone Key Expansion Module (KEM)

Contents

This section contains the following topics

- "Description" (page 203)
- "Features" (page 204)
- "Display characteristics" (page 204)
- "Key number assignments" (page 205)
- "Package components" (page 205)
- "Configuration" (page 205)
- "Installation" (page 209)
- "IP Phone KEM startup initialization" (page 210)
- "Operating parameters" (page 211)

Description

The Nortel IP Phone Key Expansion Module (KEM) is a hardware component that connects to IP Phone 2002 and IP Phone 2004 and provides additional line appearances and feature keys (see [Figure 21 "IP Phone 2002 with one IP Phone KEM attached"](#) (page 204)).

Up to two IP Phone KEMs can be connected to an IP Phone 2002 or IP Phone 2004. With two IP Phone KEMs connected, the IP Phone can have up to 48 additional line/feature keys.

The IP Phone 2004 can also have up to 48 additional line/feature keys using the **Shift** key functionality and one IP Phone KEM. With two IP Phone KEMs connected, the **Shift** key functionality does not affect the IP Phone KEMs since the maximum number of line/feature keys is already available. The IP Phone 2002 does not support **Shift** key functionality.

Figure 21
IP Phone 2002 with one IP Phone KEM attached



Features

The IP Phone KEM has the following features:

- 12 keys on each side of an LCD provide up to 24 additional self-labeled line/feature keys. Using the **Shift** key functionality, an IP Phone 2004 can have up to 48 additional logical line/feature keys.
- A desk-mount bracket and structural baseplate connect the IP Phone KEM to an IP Phone 2002 or IP Phone 2004, or to another IP Phone KEM.
- A wall-mount bracket installs the IP Phone KEM alongside a wall-mounted IP Phone 2002 or IP Phone 2004.

Display characteristics

The IP Phone KEM has one LCD between the two rows of 12 Line/feature keys (see [Figure 21 "IP Phone 2002 with one IP Phone KEM attached" \(page 204\)](#)). Each of the 24 physical keys on the IP Phone KEM has a 10-character display label. This label is set automatically, however, the user can edit the label using the controls on the IP Phone.

To alter the display and contrast on the IP Phone KEM, use the **Contrast Adjustment** option under the **Telephone Options** menu on the IP Phone. Any contrast changes you make on the IP Phone affect the IP Phone KEM. The IP Phone KEM and IP Phone do not have separate contrast adjustments.

Key number assignments

Since the IP Phone 2002 and IP Phone 2004 have key number assignments from 0 to 31, the IP Phone KEM key number assignments begin at 32. Therefore, the first IP Phone KEM has key number assignments from 32 to 55, and the second IP Phone KEM has key number assignments from 56 to 79.

Package components

Table 26 "IP Phone KEM components list" (page 205) lists the IP Phone KEM package components.

Table 26
IP Phone KEM components list

Components	Order code
IP Phone KEM - Ethergray	A0540989
IP Phone KEM - Charcoal	A0540990
IP Phone KEM wall mount kit - Charcoal	A0555218

Configuration

The IP Phone KEM must be configured in LD 11 before it is used.

Table 27
LD 11: Configure the IP Phone KEM

Prompt	Response	Description
REQ:	NEW CHG	Add new data. Change existing data.
TYPE:	2002P2	IP Phone 2002
	2004P2	IP Phone 2004
...		...
ZONE	0 – 255	Zone number to which the IP Phone 2002 or IP Phone 2004 belongs
KEM	(0) – 2	Number of attached IP Phone KEMs
		Up to two IP Phone KEMs can be attached to an IP Phone. Pressing <CR> without entering a number leaves the value unchanged.
....		
KEY	xx aaa yyyy (cccc or D) zz..z	

Prompt	Response	Description
		<p>Telephone function key assignments</p> <p>The following key assignments determine calling options and features available to an IP Phone. Note that KEY is prompted until a carriage return <CR> is entered.</p> <p>Where:</p> <p>xx = key number aaa = key name or function yyy = additional information required for the key zz.z = additional information required for the key aaa.</p> <p>The cccc or D entry deals specifically with the Calling Line Identification feature, where:</p> <p>cccc = CLID table entry of (0)-N, where N = the value entered at the SIZE prompt in LD 15 minus 1.</p> <p>D = the character "D". When the character "D" is entered, the system searches the DN keys from key 0 and up, to find a DN key with a CLID table entry. The CLID associated with the found DN key is then used.</p> <p>The position of the (cccc or D) field varies depending on the key name or function.</p> <p>You may enter a CLID table entry if aaa = ACD, HOT d, HOT L, MCN, MCR, PVN, PVR, SCN, or SCR.</p> <p>Type xx NUL to remove a key function or feature.</p> <p>Some data ports require specific key assignments. See the <i>Meridian Data Services</i> NTPs for information regarding these requirements.</p>

Prompt	Response	Description
		<p>Key number limits that can be assigned are as follows:</p> <ul style="list-style-type: none"> 0-7 for Meridian Communications Adapter (MCA) 0 to 5 for M2006 0 to 7 for M2008 0 to 59 for M2616, varies with number of add-on modules 0 to 79 for 2002P2, varies with value of KEM 0 to 79 for 2004P2, varies with value of KEM <p>The first IP Phone KEM is assigned keys 32 to 55, and the second IP Phone KEM is assigned keys 56 to 79.</p> <p>If either the Meridian Programmable Data Adapter (MPDA) or the Display Module is equipped, then key 7 on sets M2008, M2216, and M2616 and key 5 on set M2006 becomes Program keys which cannot be used as function keys.</p> <p>Any printout of the TN block does not show key 7 because it is a local function key.</p> <p>On the M2616, if CLS = HFA, key 15 on the voice TN defaults to the Handsfree key. No other feature assignment is accepted.</p> <p>Primary and secondary data DNs must be unique.</p> <p>A station SCR, SCN, MCR, or MCN DN must be removed as a member from all Group Hunt lists before the DN can be modified.</p> <p>On the M3903, keys 4-15 are blocked. No feature assignment is accepted for keys 2-15.</p> <p>On the M3903, M3904, and M3905, keys 29-31 are reserved. No feature assignment is accepted for keys 29-31 other than NUL.</p> <p>On M3904, no feature assignment is accepted for keys 12-15.</p>

Prompt	Response	Description
PAGEOFST T	<Page> <KeyOffset>	<p>On M3905, the craftsperson can assign NUL or a server application on key 5. On key 6, the craftsperson can assign NUL or a local application.</p> <p>On M3905, the craftsperson can assign NUL or the program key on key 7.</p> <p>On M3905, the craftsperson can assign AAG, AMG, ASP, DWC, EMR, MSB, or NRD on keys 8-11. Other features are blocked.</p> <p>Automatically calculates the IP Phone KEM key based on the entered values. This prompt enables the system administrator to enter a Page number of 0 or 1 and a Key Offset number from 0 to 23. Once entered, the KEY prompt is prompted with the appropriate KEY value filled in.</p> <p>Enter <CR> to terminate data entry.</p> <p>Applies to an IP Phone 2004 with KEM = 1, and where <CR> was entered at the KEY prompt.</p> <p>Does not apply to an IP Phone 2002.</p> <p>When values are entered for Page and KeyOffset, the KEY xx prompt displays, followed by PAGEOFST prompt. This loop continues until no values (<CR> only) are entered at the PAGEOFST prompt.</p>
KEY xx		<p>Edit the IP Phone KEM key number specified by PAGEOFST, where: xx = the number of the key (for example, KEY 36)</p>
KEMOFST	<KEM> <KeyOffset>	<p>Enter <CR> to keep the current setting.</p> <p>Automatically calculates the IP Phone KEM key based on the entered values. This prompt enables the system administrator to enter a KEM number of 1 or 2 and a Key Offset number from 0-23. Once entered, the KEY prompt is prompted with the appropriate KEY value filled in.</p> <p>Enter <CR> to terminate data entry.</p> <p>When values are entered for KEM and KeyOffset, the KEY xx prompt displays, followed by KEMOFST prompt. This loop continues until no values (<CR> only) are entered at the KEMOFST prompt.</p>

Prompt	Response	Description
KEY xx		<p>Applies to an IP Phone 2002 if <CR> was entered at the KEY prompt.</p> <p>Applies to an IP Phone 2004 with KEM = 2, and where <CR> was entered at the KEY prompt.</p> <p>Edit the IP Phone KEM key number specified by KEMOFST, where: xx = the number of the key (for example, KEY 36)</p> <p>Enter <CR> to keep the current setting.</p>

Installation

The IP Phone KEM mounts on the right side of an IP Phone 2002 or IP Phone 2004. The IP Phone KEM snaps into the receptacle on the back of the IP Phone using the desk-mount bracket and structural baseplate supplied with the IP Phone KEM (see [Figure 22 "IP Phone KEM attached to an IP Phone 2002"](#) (page 209)).

The IP Phone KEM connects to the IP Phone 2002 or IP Phone 2004 using the Accessory Expansion Module (AEM) port on the IP Phone.

Figure 22
IP Phone KEM attached to an IP Phone 2002



Procedure 41

Connecting the IP Phone KEM to an IP Phone 2002 or IP Phone 2004

Step	Action
------	--------

- | | |
|---|--|
| 1 | Remove the IP Phone from the stand by pressing the IP Phone tilt handle, and pulling the IP Phone away from the stand. |
|---|--|

For the IP Phone 2004, you can also adjust the stand angle to maximum, instead of removing the stand.

- 2 Place the connecting arm of the IP Phone KEM behind the IP Phone and align the IP Phone KEM connection plug to the AEM port on the back of the IP Phone.

The IP Phones 2002 with the product codes: NTDU76AB34, NTDU76BB34, NTDU76AB70, and NTDU76BB70 have shorter connector pins than the other IP Phone 2002. Therefore, the ribbon cable connector of the IP Phone KEM must be detached from the retaining clip and pressed manually into the header connector before attaching the IP Phone KEM.

- 3 Press the IP Phone KEM and IP Phone firmly together until the IP Phone KEM locks into place.
- 4 If connecting a second IP Phone KEM, repeat steps 1 to 3.
The second IP Phone KEM is attached to the right side of the first IP Phone KEM.
- 5 Attach the IP Phone stand and the IP Phone KEM stand, if removed. Adjust each IP Phone KEM stand to the same angle as the IP Phone.

The IP Phone KEM powers up.

The IP Phone KEM uses the electrical connection of the IP Phone 2002 or IP Phone 2004 for power. It does not have its own power source.

—End—

IP Phone KEM startup initialization

Once the IP Phone KEM has been installed and powered up on your IP Phone 2002 or IP Phone 2004, the IP Phone KEM initializes (see [Table 28 "Startup initialization process for the IP Phone KEM" \(page 210\)](#)).

Table 28
Startup initialization process for the IP Phone KEM

Phase	Description
1. IP Phone KEM performs self-test	<p>The self-test confirms the operation of the IP Phone KEM local memory, CPU, and other circuitry. While undergoing this self-test, the IP Phone KEM display lights up.</p> <p>If the IP Phone KEM display does not light up, or lights up and then goes blank, or fails to begin flashing, check that the IP Phone KEM is correctly installed and configured.</p>

Phase	Description
2. IP Phone KEM establishes communication with the IP Phone	The IP Phone KEM display flashes until it establishes communication with the IP Phone. If the IP Phone KEM display does not stop flashing, communication has not been established with the IP Phone. Check that the IP Phone KEM is correctly installed and configured.
3. IP Phone KEM downloads keymaps	The key labels download to the IP Phone KEM. During the download, the display is blank.

When the three phases complete successfully, you are ready to use the additional line/feature keys on your IP Phone KEM.

If you have a second IP Phone KEM installed on your IP Phone, the one to the immediate right of the IP Phone must be functional for the subsequent IP Phone KEM to work. This is because the second IP Phone KEM receives its power, and communicates with the IP Phone, through the first IP Phone KEM.

Operating parameters

General

If an IP Phone KEM is not responding, and lines or features are configured on keys 32 to 79, calls can be directed to those keys which the user cannot access. This means the IP Phone 2002 or IP Phone 2004 rings but the call cannot be answered. In such cases, the incoming call receives Call Forward No Answer (CFNA) treatment.

IP Phone 2002

If only one IP Phone KEM is configured in LD 11, but two IP Phone KEMs are detected on an IP Phone 2002, the second IP Phone KEM is ignored. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If two IP Phone KEMs are configured in LD 11, but only one IP Phone KEM is responding, the keys on the second IP Phone KEM are available for call processing but are not accessible to the user. This means that lines and features on keys 56 to 79 can cause the IP Phone 2002 to ring, but there is no way to answer it. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

IP Phone 2004

If only one IP Phone KEM is configured in LD 11, but two IP Phone KEMs are detected on an IP Phone 2004, the Terminal Proxy Server (TPS) assigns keys 56 to 79 to the second IP Phone KEM. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If two IP Phone KEMs are configured in LD 11 but only one IP Phone KEM is responding, the TPS assigns keys 32 to 79 to the single IP Phone KEM (using the **Shift** key functionality). An error message displays to alert the administrator that the hardware configuration does not match the administered configuration. When a second IP Phone KEM is detected, the TPS changes the key assignments to display across both IP Phone KEMs, as expected.

Virtual Office

When a Virtual Office (VO) login occurs from an IP Phone 2002 or IP Phone 2004 that does not have the same number of IP Phone KEMs responding as configured on the IP Phone used to log in, call processing may terminate on a key that is not physically available. In other words, the IP Phone rings but the call cannot be answered.

During the VO login process, the existence of any IP Phone KEM is verified. If a mismatch is detected, the login proceeds normally; however, an error message is generated to alert the administrator of the mismatch.

Firmware

The IP Phone KEM firmware is not downloadable. If the IP Phone KEM firmware must be upgraded or changed, the IP Phone KEM must be replaced with a new IP Phone KEM containing the updated firmware.

Nortel IP Softphone 2050

Contents

This section contains the following topics:

- "Introduction" (page 213)
- "Description" (page 214)
- "Supported features" (page 215)
- "Operation" (page 219)
- "Key number assignments" (page 224)
- "Operating parameters" (page 226)
- "System components" (page 226)
- "Before you begin" (page 227)
- "First-time installation" (page 228)
- "Installing or upgrading the IP Softphone 2050" (page 230)
- "Running the IP Softphone 2050 for the first time" (page 234)
- "Changing the TN of an existing IP Softphone 2050" (page 234)
- "Removing an IP Softphone 2050 from service" (page 235)

Introduction

This section explains how to install and maintain the IP Softphone 2050. For information about using the IP Softphone, see the *IP Softphone 2050 User Guide (NN43119-101)*.

This section contains the following procedures:

- Procedure 43 "Installing an IP Softphone 2050 for the first time" (page 229).
- Procedure 44 "Installing the IP Softphone 2050 on the PC (new installation)" (page 230).
- Procedure 45 "Upgrading the IP Softphone 2050 on your PC" (page 231).

- Procedure 46 "Uninstalling the IP Softphone 2050 (Version 1)" (page 232).
- Procedure 47 "Uninstalling the IP Softphone 2050 (Version 2)" (page 232).
- Procedure 50 "Changing the TN of an existing IP Softphone 2050" (page 234).
- Procedure 51 "Removing an IP Softphone 2050 from service" (page 235).

Description

The IP Softphone 2050 is a Windows-based application that provides voice services for Personal Computers (PC). The IP Softphone 2050 operates on PCs that run Windows 2000 Professional, Windows XP Pro, and Windows XP Home.

Designed to work with IP-based phone systems, the IP Softphone 2050 provides Voice Over IP (VoIP) services using a telephony server and an enterprise Local Area Network (LAN). The VoIP application is comprised of the following components:

- Settings—used to configure the IP Softphone
- IP Softphone 2050—the IP Softphone user interface
- IP Softphone 2050 QoS

The IP Softphone 2050 supports the following features:

- 12 user-defined feature keys: six programmable line (DN)/feature keys and six lines/features accessed by pressing the Shift key
- four context-sensitive soft keys that provide access to a maximum of nine features
- four-line display
- directory capabilities stored locally on the PC or linked to external directories, such as LDAP, Microsoft Outlook, and Windows Address Book Directory
- one-click direct dialing from various windows and applications
- five specialized feature keys
 - Directory
 - Inbox/Message
 - Shift/Outbox
 - Services
 - Quit

- Copy
- Expand
- dedicated call processing keys
 - Hold
 - Goodbye
 - Answer
 - Mute
 - Navigation
 - Message Waiting
- user-selected ringer lets the PC speakers or the headset ring for incoming calls
- choice of two window skins, as well as an Accessibility Interface option for the visually-impaired

The Accessibility Interface operates with screen reading software, such as JAWS® for Windows from Freedom Scientific, which enables visually-impaired users to access the full range of IP Softphone 2050 features. Visually-impaired users can follow [Procedure 48 "Installing the Accessibility Interface" \(page 232\)](#) to install the Accessibility Interface from the IP Softphone 2050 CD ROM.

- programmable hot keys allow single-key access to user-definable features
- three input modes: Digit, Alpha, and Native
- macro functions available for programming long dialing patterns
- support for G.711, G.729A, and G.729AB codecs for operation at a variety of network connection speeds

Supported features

The IP Softphone 2050 supports the following additional features:

- Call Duration Timer
- ability to change the feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration

- Virtual office
- Branch Office
- Call Recording
- language support: English, French, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Japanese, Russian, Latvian, and Turkish

Language support

The IP Softphone 2050 is affected by the following three language controls:

- Operating system language
- IP Softphone 2050 language selection—sets the language displayed in the help screens and in the menus (select the IP Softphone 2050 language from the Application menu or during installation)
- TPS language Selection—sets the language in the display area (the language in the display areas is selected from the Language menu)

In normal operation, the language chosen from the IP Softphone 2050 language setup matches the language chosen from the Language menu. Otherwise, the soft key labels and feature prompts appears in a different language than the help text and menu items on the IP Softphone 2050 application. The user must ensure that the appropriate language is chosen.

Components

The IP Softphone 2050 supports the following main components:

- Call Control window
- Local Directory window
- Settings window
- System tray icon and menu
- third-party supported applications
- i2050.exe application

Call Control window

You can use the 1140 Call Control Window (see [Figure 23 "1140 Call Control window" \(page 217\)](#)), or the Compact skin Call Control window (see [Figure 24 "Compact skin Call Control window" \(page 217\)](#)) to make and manage IP Phone calls.

Figure 23
1140 Call Control window

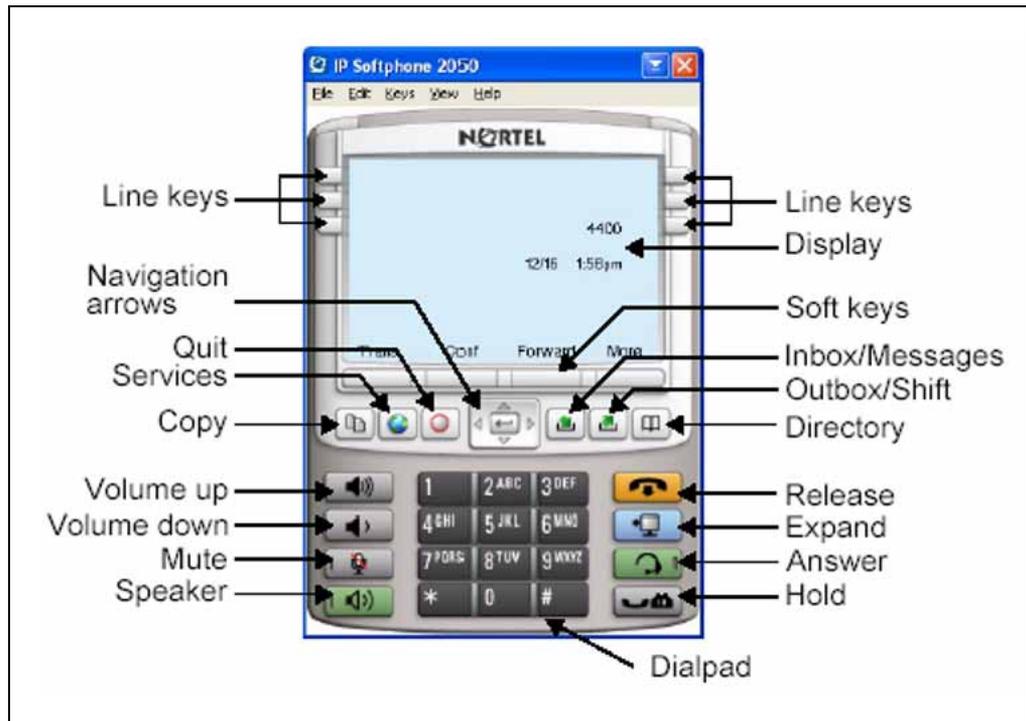


Figure 24
Compact skin Call Control window

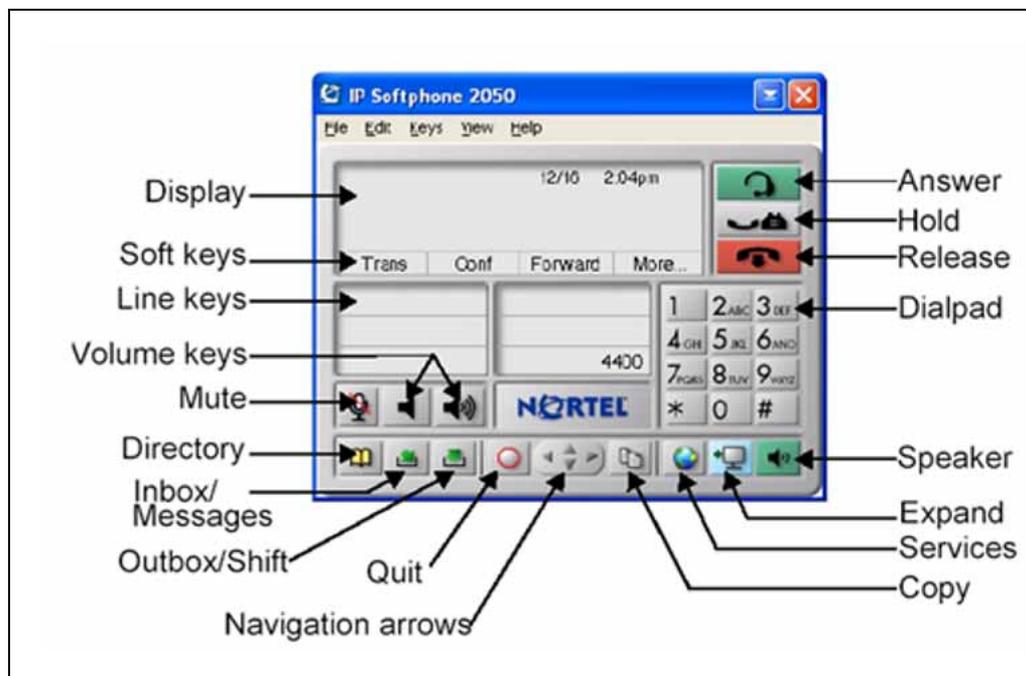


Table 29 "Call Control window elements and functions" (page 218) lists the elements and functions of the Call Control window.

Table 29
Call Control window elements and functions

Element		Function
Primary display		The primary display area provides call information (for example, Caller ID) and instructions for using certain soft key features. In the idle state, only the date and time are displayed.
Soft keys		Four additional soft-labeled keys on the IP Softphone 2050 support a specific subset of the key features.
Answer		Click the Answer key to answer and make calls.
Hold		Click the Hold key to place an active call on hold. The feature key label for the line placed on hold displays a flashing icon. Click the Line key to return to the call.
Release		Click the Release key to end an active call.
Line keys		Six programmable line keys represent line appearances, DNIs, or features.
Volume	 	Use the volume keys to increase or decrease the headset volume.
Mute		Click the Mute key to listen to the receiving party without transmitting. Click the Mute key to return to a two-way conversation. The Mute key mutes the headset microphone.
Directory		Click the Directory key to access the Network Directory.
Inbox/Message		Click the Inbox/Message key to access messages or return a call.
Shift/Outbox		Press the Shift key to shift between two feature key pages when a second feature key page exists.
Copy		Click the Copy key to copy a network service, feature, or folder.
Quit		Click the Quit key to quit a network service or feature.
Navigation arrows		Use the navigation arrows to scroll through menus and lists in the display area.

Element		Function
Send/Enter		<p>Press the Send/Enter key, at the center of the Navigation key cluster, to confirm menu selections.</p> <p>The Send/Enter key is only available on the 1140E Call Control window.</p>
Dialpad		Click numbers on the dialpad to dial a number.
Speaker		Click the Speaker key to answer and make calls using the handsfree speaker.
Expand		The Expand key is reserved for future implementation.
Services		<p>Press the Services key access the following items:</p> <ul style="list-style-type: none"> • Language • Date/Time • Set Info • Call Log Options • Ring type • Call Timer • Change Feature Key Label • Name Display Format • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured) • Password Admin <ul style="list-style-type: none"> — Station Control Password

Operation

Display characteristics

The IP Softphone 2050 has the following display areas:

- information display
- soft key label display
- keypad dialing keys display
- feature keys display

Information display area

The information display area can contain four lines of text, up to a maximum of twenty four characters for each line. The display area consists of 2 areas: Info line and Info window.

Info line The Info Line is the first (top) line of display text. The left 10-character area shows the Call Server type. The right part of the Info Line shows the current time and date.

Info window The Info Window display area that shows prompts and information about calls. During a call the information area is used to display dialed digits, calling line ID, called party name, application-specific information, and various messages such as *Release and Try Again*.

When the information exceeds 3 x 24 characters, a scroll icon tells the user to press the scroll keys to view the second line of the display.

Soft key label display

A maximum of 10 functions can be assigned to the soft keys. Functions are assigned to the soft keys in layers in LD 11.

Use the **More** soft key to navigate through the layers of functions. If only 4 functions are assigned to the soft keys, the **More** key does not appear and all four functions are displayed.

The soft key label has a maximum of 7 characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a flashing icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last, or rightmost, character is truncated.) If a feature is enabled, the icon state turns to ON. It remains in the ON state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

System Tray

The System Tray provides fast access to most of the IP Softphone 2050 functionality. The user can make, answer, and manage a call, as well as access macros and features from the System Tray without opening the Call Control window.

Nortel USB Audio Kit

The USB Audio Kit enables the user to speak and hear callers. To ensure proper IP Softphone 2050 operation, use only Nortel-supported USB audio kits. The USB Audio Kit includes the following:

- USB Headset Adapter (desktop or mobile)
- Installation Guide

- USB cord

The following USB adapters are supported on the IP Softphone 2050:

- Nortel Enhanced USB Adapter (desktop)
- Nortel Mobile USB Adapter (mobile)

The Algo Analog Terminal Adapter (ATA) is a USB adapter that lets you use analog terminals instead of headsets. With an Algo ATA users can, for example, use a cordless headset with their IP Softphone 2050.

The IP Softphone 2050 is compatible with the Algo ATA. For support, see www.algosolutions.com.

USB Headset Adapter

The USB Headset Adapter provides a controlled high-quality audio environment, including:

- absolute and predictable loss and level plan implementation that is necessary to meet TIA-810, FCC part 68 and its international equivalents, as well as the ADA requirements for the hearing impaired
- compliance with version 1.1 of the USB Device Specification and Windows Plug & Play specifications
- simple installation using standard Windows drivers (requires no additional software or drivers)
- support on Windows 2000 Professional, Windows XP Pro, and Windows XP Home

See the *IP Softphone 2050 User Guide (NN43119-101)* for specific operation system information.

- in-use lamp connector with in-use control provided by polarity insensitive isolated contact closure
- red Message Waiting light, located at the top of the USB Headset Adapter, that flashes when you have voice mail messages
- IP Softphone 2050 Smart Functions button enables the IP Softphone 2050 Smart Functions menu that provides quick access to IP Softphone 2050 features
- Mute light that indicates a call is on mute

The USB Headset Adapter auto-configures in the supported Windows operating system. No additional software is required.

Registration

When you add an IP Softphone 2050 to the network, depending on configuration, the IP Softphone 2050 can connect to a predefined IP address or can request an IP address from a DHCP server. The IP Softphone 2050 then contacts the Connect Server, which instructs the IP Softphone 2050 to display a message on its display screen requesting the customer node number and TN.

After the customer enters this information, the IP Softphone 2050 contacts the Node Master, which selects a TPS with sufficient capacity to register the IP Softphone 2050. The IP Softphone 2050 contacts the chosen TPS and, if the IP Softphone 2050 is valid, registers it with the system. The registration information is then saved to the IP Softphone 2050.

Loss plan

The USB Headset Adapter provides the IP Softphone 2050 with a fixed loss plan compliant with the TIA-810A specification. If other headsets or audio devices are used, the loss plan is unknown and undefined. Nortel supports the resolution of audio problems only for the USB Headset Adapter.

Echo cancellation

Echo can be generated electrically when an impedance mismatch occurs, or generated acoustically by feedback from a speaker or ear piece to a microphone. Any echo that is ultimately returned to the IP Phone is more noticeable to the listener because of the additional delay introduced by the IP connection.

The Voice Gateway Media Card has echo cancelers included as part of its function that cancels echo generated on the TDM side of the Media Gateway. When audio goes through the Voice Gateway Media Card, the echo cancellers are enabled.

The IP Softphone 2050 has no echo canceller, so a slight echo from acoustic coupling on the headset can occur in some call situations.

Clock synchronization

Buffer underruns and overruns can occur since no sample clock is at the receiving end of an IP audio stream synchronized to the transmitting clock. The buffer overruns and underruns are corrected by two mechanisms, both of which apply to the IP Phones and the DSPs on the Voice Gateway Media Card.

Jitter buffer

Use the default value sent from the TPS (the value configured in TM-[Nortel recommends that you use the default value]) to configure the IP Softphone 2050 jitter buffer.

The jitter buffer has a desired size and a maximum allowable size. If the jitter buffer exceeds its maximum allowable size, sufficient frames are discarded to reduce the contents of the jitter buffer to the desired setting. If the jitter buffer underruns, frames are held in the jitter buffer until it fills to the desired level. Both underrun and overrun result in a discontinuity in the audio.

For codecs that support silence suppression, the jitter buffer is resynchronized at the beginning of each talk spurt.

QoS

A combination of codec selection, jitter buffer and packet time, and the use of the DiffServ code point of the network contributes to the end-to-end QoS.

However, the IP Softphone 2050 is an application within the context of the PC operating system, so the operating system has an effect on the end-to-end QoS for the IP Softphone 2050. The DSP functionality (such as codec packetization) implemented in DSP hardware on the IP Softphone 2050 and Voice Gateway Media Card runs as part of the application code on the PC CPU. If the CPU is busy with other tasks, voice quality can be negatively affected.

The number of buffers used to buffer audio data between the application and PC audio hardware device driver is adjustable from the Settings > Sound Devices window. Using fewer buffers reduces the audio path delay but increases the chances of dropouts and choppy speech, depending on the speed and utilization of the PC CPU.

DiffSERV (DSCP)

The IP Softphone 2050 uses DSCP settings assigned by the TPS. The IP Softphone 2050 supports DSCP on Windows 2000 Professional, Windows XP Pro, and Windows XP Home.

802.1Q

The IP Softphone 2050 uses 802.1p (priority) settings assigned by the TPS. The IP Softphone 2050 supports 802.1p on Windows 2000 Professional, Windows XP Pro, and Windows XP Home. The service can be installed from the CD-ROM. If you install the IP Softphone 2050 with Administrators access, then this service is installed automatically.

Codec

The IP Softphone 2050 provides the following codecs:

- G.711 provides the highest quality (if the network facilities can handle the packet flow) because there is no compression.
- G.729A is ranked best; it has 8:1 compression but no voice activity detection.

- G.729AB is the same as G.729A but includes voice activity detection; while this provides the lowest average network bandwidth utilization, in some call environments the speech quality suffers due to clipping of the beginning of words.

Frame size

The IP Softphone 2050 supports the following range of frame sizes

- G.711-64 A-law and μ law: 10-960—10 ms increments
- G.729A: 10-960—10 ms frames
- G.729AB: 10-960—10 ms frames

Key number assignments

The IP Softphone 2050 has 6 keys that present 12 feature keys, with 6 on each feature key page. The keys are numbered from 0 to 11. The Shift key is used to change between two feature pages, 0 to 5 and 6 to 11.

If a feature requires a feature package that is not present for the Call Server installation, that feature does not appear within the default configuration for the IP Softphone 2050.

The Message key is numbered 16. If Message Waiting is not configured, then key 16 must be NUL.

Key numbers between 17 to 31 are assigned to the four soft label keys immediately below the display area. The supported features are: A03, A06, CFW, CHG, CPN, PRK, PRS, RGA, RPN, SCU, SCC, SSU, SSC, and TRN.

[Table 30 "IP Softphone 2050 soft keys" \(page 224\)](#) describes the IP Phone feature assignment for each soft key. Use LD 11 to program keys 16 to 26 on the IP Softphone 2050.

If you attempt to configure anything other than the permitted response, the Call Server generates an error code.

Table 30
IP Softphone 2050 soft keys

Prompt	Response	Description
Key 16	MWK	Message Waiting key
	NUL	Removes function or feature from key
Key 17	TRN	Call Transfer key
	NUL	Removes function or feature from key

Prompt	Response	Description
Key 18	A03	three-party conference key
	A06	six-party conference key
	NUL	Removes function or feature from key
Key 19	CFW	Call Forward key
	NUL	Removes function or feature from key
Key 20	RGA	Ring Again key
	NUL	Removes function or feature from key
Key 21	PRK	Call Park key
	NUL	Removes function or feature from key
Key 22	RNP	Ringing Number pickup key
	NUL	Removes function or feature from key
Key 23	SCU	Speed Call User
	SSU	System Speed Call User
	SCC	Speed Call Controller
	SSC	System Speed Call Controller
	NUL	Removes function or feature from key
Key 24	PRS	Privacy Release key
	NUL	Removes function or feature from key
Key 25	CHG	Charge Account key
	NUL	Removes function or feature from key
Key 26	CPN	Calling Party Number key
	NUL	Removes function or feature from key
Keys 27 to 31		Reserved

Operating parameters

The operating parameters for the IP Softphone 2050 are as follows

- The minimum recommended system hardware for the IP Softphone 2050 application is
 - Pentium-compatible CPU (200 megahertz [MHz] or higher)
 - 128 megabytes (MB) RAM or higher for Microsoft Windows 2000
 - 256 MB RAM or higher for Windows XP
 - 55 MB free hard drive space (all languages)
 - 800 by 600 resolution monitor (16-bit color)
 - Universal Serial Bus (USB) port (version 1.1 or 2.0)
 - USB Audio Kit

For information about supported operating systems, see the IP Softphone 2050 User Guide.

- Perform the software version upgrade for IP Softphone 2050 manually. The technician must do this at the PC. The Voice Gateway Media Card does not download any software to the IP Softphone 2050. The `isetShow` command on the Voice Gateway Media Card displays the current version of any registered IP Softphone 2050.
- The IP Softphone 2050 does not have an ACD Supervisor headset jack. Agent walkaway is supported with the Enhanced USB Keypad Adapter.
- An IP Softphone 2050 does not register against a TN configured for any other type of IP Phone.
- Soundcard audio is supported only for incoming call notification. Nortel supports USB Headset Adapter for the speech path.
- 5 menu options available on the IP Phone 2004, not required on the IP Softphone 2050, are
 - Volume adjustment
 - Contrast adjustment
 - Display diagnostics
 - Key click
 - On-hook default path

System components

The IP Softphone 2050 is comprised of an external Universal Serial Bus headset adapter (Nortel Enhanced USB Adapter [desktop]) and a software application installed on the user PC. The IP Softphone 2050 also supports a mobile adapter (Nortel Mobile USB Adapter).

ATTENTION

Use your IP Softphone 2050 with the approved Nortel Enhanced USB adapter (desktop) or Nortel Mobile USB Adapter *only*.

Table 31 "IP Softphone 2050 package components" (page 227) lists the IP Softphone 2050 package components.

Table 31
IP Softphone 2050 package components

Component	Code
Nortel Mobile USB Adapter	
Nortel Mobile USB Adapter Monaural Headset IP Softphone 2050 Kit includes	NTEX14MD
• IP Softphone 2050 application software CD/ROM	NTDW83BA
• Nortel Mobile USB Headset Adapter with Monaural Headset (Non-RoHS)	NTEX14MB
Nortel Mobile USB Headset Adapter (no headset)	NTEX14MA
Nortel Mobile USB Headset Adapter (no headset) (RoHS)	NTEX14MAE6
Nortel Mobile USB Headset Adapter with Monaural Headset (RoHS)	NTEX14MBE6
Nortel Enhanced USB Adapter (desktop)	
Nortel Enhanced USB Audio (desktop) kit	NTEX14AA
Nortel Enhanced USB Audio Adapter (no headset)	NTEX14AB
USB Audio Kit with GNN DuraPlus Monaural Headset (Non-RoHS)	NTEX14AC
USB Audio kit with GNN DuraPlus Monaural Headset (RoHS)	NTEX14ACE6
Nortel Handset cord (Charcoal) for use with the Nortel Enhanced USB Audio Adapter Kit	NTEX14BA

Before you begin

The following section provides a step-by-step guide through the IP Softphone 2050 installation process. Before installing the IP Phone, complete the following pre-installation checklist.

Procedure 42

Preinstallation checklist

Step	Action
1	Ensure you have the IP Softphone 2050 application software CD.
2	To install and configure an IP Softphone 2050, the host Call Server must be equipped with the Voice Gateway Media Card.

- 3 Understand the three configuration modes from which you can choose from as you proceed through the installation of the IP Softphone 2050. The 2 configuration modes are
 - Static IP address—see "[Static IP address assignment](#)" (page 228)
 - Partial DHCP—see "[Dynamic IP address assignment:Partial DHCP](#)" (page 228)
- 4 A DHCP server and DHCP relay agents, if required, must also be installed, configured, and running.

—End—

First-time installation

During the first-time installation, the two IP address parameters entered either manually- or automatically, depending on the installation configuration. They are as follows

- Static IP address assignment
- Partial DHCP

Static IP address assignment

During the installation, enter the IP Softphone 2050 parameters manually using the dialpad.

Enter the IP address, subnet mask, and default Gateway address. You must also enter the Connect Server parameters including IP address, port number, action, and retry count.

Dynamic IP address assignment:Partial DHCP

For a partial DHCP installation, you must provide, through the IP Phone dialpad, the Connect Server parameters including: IP address, port number, action, and retry count. Other parameters (IP Phone IP address, subnet mask, and default Gateway) are obtained from the DHCP server.

Enter the IP Phone pass word, node ID, and TN manually, using the dialpad.

For more information about DHCP servers, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Use [Procedure 43 "Installing an IP Softphone 2050 for the first time"](#) (page 229) to install an IP Softphone 2050 for the first time.

Procedure 43
Installing an IP Softphone 2050 for the first time

Step	Action
1	Install the Voice Gateway Media Card. For more information, see <i>IP Line Fundamentals (NN43100-500)</i> .
2	Configure a virtual loop on the Call Server, using LD 97. For more information, see <i>Software Input Output Administration (NN43001-611)</i> .
3	Configure the IP Softphone 2050 using LD 11. At the prompt, enter the following <pre>REQ: chg TYPE: 2050PC</pre>
4	Install the USB Headset Adapter. If you are using the mobile adapter, connect the headset to the adapter. If you are using the desktop adapter, you must <ol style="list-style-type: none"> <li>Connect the coiled lower cord to the headset cord with the Quick Disconnect connector. Ensure the Quick Disconnect connector is securely fastened. <li>Connect the headset cord to the RJ9 jack on the adapter.
5	Connect the USB cable to the headset adapter and to one of the USB jacks on the back of your PC or USB hub. The first time the headset adapter is plugged in, a delay occurs while Windows configures the device and locates the appropriate driver software. During the installation, you are prompted to supply the original Windows CD-ROM so Windows can locate the required drivers.
6	Install the IP Softphone 2050.
7	Configure the IP Softphone 2050 parameters. Click the Server tab in the Settings window and choose one of the following <ul style="list-style-type: none"> <li>To manually configure the IP Softphone 2050 parameters, enter the IP address of the Call Server, Server type, port number, and retries. <li>For DHCP, select the check box beside Automatic (DHCP). The IP address, Server type, port number, and retries are automatically retrieved from the DHCP Server.

For more information about using partial DHCP, see [Procedure 19 "Installing an IP Phone 2004 for the first time using DHCP"](#) (page 121).

- 8 Click **Apply**.

—End—

Installing or upgrading the IP Softphone 2050

Use the following options to obtain the latest version of the IP Softphone 2050

- new installation—installing the IP Softphone 2050 for the first time
- upgrade—upgrading the IP Softphone 2050 to the latest version

IP Softphone (Version 1) and IP Softphone (Version 2) can coexist on a PC, although both versions cannot run at the same time.

Before performing a new installation or an upgrade, check the version of IP Softphone 2050 software.

ATTENTION

Before you upgrade an IP Softphone 2050, record the information found in the **Server** window. This information may required in the future.

Use [Procedure 44 "Installing the IP Softphone 2050 on the PC \(new installation\)"](#) (page 230) for a new installation of the IP Softphone 2050.

Procedure 44

Installing the IP Softphone 2050 on the PC (new installation)

Step	Action
1	Insert the CD-ROM disk into the CD-ROM drive of your PC. Installation should proceed automatically. If it does not, then continue with step 2, otherwise go to step 5.
2	Double-click the My Computer icon.
3	Double-click the CD icon.
4	Double-click the Setup icon.
5	Follow the instructions on-screen to complete the installation.
6	Select Start > Programs > Nortel > IP Softphone 2050 to start the IP Softphone 2050 application.

- 7 Select **Settings** to assign a server address, select sound devices, and select a server type.

If you are installing the IP Softphone 2050 on a Windows XP or Windows 2000 platform, you must install the Windows QoS Packet Scheduler. See [Procedure 49 "Installing the Windows QoS Packet Scheduler" \(page 233\)](#) on [Procedure 49 "Installing the Windows QoS Packet Scheduler" \(page 233\)](#).

—End—

Use [Procedure 45 "Upgrading the IP Softphone 2050 on your PC" \(page 231\)](#) to upgrade the IP Softphone 2050 on the PC.

Procedure 45

Upgrading the IP Softphone 2050 on your PC

Step	Action
1	Download the IP Softphone 2050 upgrade file from the Nortel Web site and extract all files to a working directory. See either the <i>CS 1000 Release 5.0 Product Bulletin</i> or the <i>IP Line 5.0 Read Me First</i> about download instructions.
2	Double-click the My Computer icon and navigate to the working directory.
3	Double-click the Setup icon.
4	Follow the instructions on-screen to complete the installation. Compare the values currently in the configuration utility to the values recorded prior to the upgrade. These should be identical.
5	Select Start > Programs > Nortel > IP Softphone 2050 to start the IP Softphone 2050 application.
6	Select Settings to assign a server address, select sound devices, and select a server type.

—End—

Use [Procedure 46 "Uninstalling the IP Softphone 2050 \(Version 1\)" \(page 232\)](#) to uninstall IP Softphone 2050 (Version 1).

Procedure 46
Uninstalling the IP Softphone 2050 (Version 1)

Step	Action
1	Select Start > Settings > Control Panel > Add/Remove Programs .
2	Choose Nortel Networks i2050 Software Phone .
3	Select Remove .
4	Select Yes to confirm.

—End—

Procedure 47
Uninstalling the IP Softphone 2050 (Version 2)

Step	Action
1	Select Start > Settings > Control Panel > Add/Remove Programs .
2	Choose Nortel Softphone 2050 .
3	Select Remove .
4	Select Yes to confirm.

—End—

Visually impaired users can follow [Procedure 48 "Installing the Accessibility Interface" \(page 232\)](#) to install the Accessibility Interface from the IP Softphone 2050 CD-ROM.

Procedure 48
Installing the Accessibility Interface

Step	Action
1	Press and hold Shift .
2	Insert the IP Softphone 2050 installation CD into your CD-ROM drive.
3	Press and hold Shift for several seconds to prevent Autorun from starting.
4	If the Installation Wizard starts

- a. Wait until the **Welcome to the Install Shield Wizard for the Nortel IP Softphone 2050** screen appears.
 - b. Press **Tab** to select **Cancel**.
 - c. Press **Return**.
 - d. Click **Yes** to confirm that you want to cancel the installation.
 - e. Click **Finish**.
- 5 From Windows Explorer, select your CD-ROM.
- 6 Select **Accessibility.bat**.
- The file Accessibility.bat executes the command line "setup /s /vqb/vUI508=1". This installs the application and sets the user interface to the Accessibility Interface.

—End—

Procedure 49

Installing the Windows QoS Packet Scheduler

Step	Action
1	Select Start > Control Panel .
2	Select Network Connections (Classic View or Windows XP), or Network and Dialup Connections (Windows 2000).
3	Right-click Local Area Connection .
4	Select Properties .
5	Click Install .
	The Select Network Component Type window opens.
6	Click Add .
	The Select Network Service window opens.
7	Select QoS Packet Scheduler .
8	Click OK .

—End—

Running the IP Softphone 2050 for the first time

Start the IP Softphone 2050 in one of the following ways

- Select **Start > Programs > Nortel > IP Softphone 2050**.
- Click the desktop shortcut (if one was created during the installation).
- Click **Automatic startup sequence**.

If you want the IP Softphone 2050 to start automatically when the PC starts, create a shortcut to the application in the Startup folder

When an IP Softphone 2050 is started for the first time and connects to the network, the IP Softphone executes the following start-up sequence

1. Obtain the IP parameters.
2. Find a Media Gateway server and authenticate the user.

As the IP Softphone 2050 registers with the Signaling Server, one of the following occurs

- If a non-null node password is enabled, you are prompted to enter the node number and password. Use the keyboard or numeric keypad to enter the prompts for a node number and password. After the password is verified, enter the TN of the IP Softphone 2050. See *IP Line Fundamentals (NN43100-500)* for further information about the password feature.
- If the null node password is configured and enabled, these screens are skipped and no option is provided to change the password.
- If the node password is disabled or not configured, it prompts for a node number and TN. Enter the node number and TN using the keyboard or numeric keypad.

The IP Softphone 2050 is now configured and is used.

Changing the TN of an existing IP Softphone 2050

This procedure is required for a new user of the IP Softphone 2050 application.

Procedure 50

Changing the TN of an existing IP Softphone 2050

Step	Action
1	Exit the IP Softphone 2050 application.
2	Restart the IP Softphone 2050 application.

If the node password is not configured, or is configured but disabled, go to [step 3](#).

If the node password is configured and enabled for the node, go to [step 4](#).

- 3 During startup, the IP Softphone 2050 registers again with the TPS, and the IP Softphone 2050 displays the existing node number and TN for approximately five seconds.
- 4 If the password is configured and enabled for the node, the node number and password prompt displays for approximately 5 seconds; enter the correct password within this 5-second period.

If the user activates the Clear soft key during the 5-second period, the existing node and TN are cleared and the user is prompted for new parameters.

—End—

Removing an IP Softphone 2050 from service

Procedure 51

Removing an IP Softphone 2050 from service

Step	Action
------	--------

- | | |
|---|---|
| 1 | Exit the IP Softphone 2050 application. |
| 2 | Uninstall the IP Softphone 2050 application from the PC using the Windows Add/Remove Programs.

In LD 11, enter OUT at the TN prompt. |

—End—

Nortel WLAN Handset 2210, WLAN Handset 2211, WLAN Handset 2212, WLAN Handset 612, and WLAN Handset 6140

For information about WLAN Handset 2210, WLAN Handset 2211, WLAN Handset 2212, WLAN Handset 6120, and WLAN Handset 6140, see *WLAN IP Telephony Installation and Commissioning (NN43001-504)*.

Nortel Mobile Voice Client 2050

Contents

This section contains the following topics:

- "Introduction" (page 239)
- "Description" (page 240)
- "System requirements" (page 240)
- "Supported features" (page 240)
- "MVC 2050 components" (page 242)
- "Operation" (page 248)
- "MVC 2050 installation" (page 249)
- "MVC 2050 removal" (page 251)
- "Configuration" (page 251)
- "MVC 2050 and WLAN" (page 258)

Introduction

This section describes how to install, configure, and remove the Nortel Mobile Voice Client 2050. For information about using the MVC 2050, see the *Mobile Voice Client 2050 User Guide (NN43119-103)*.

This section contains the following procedures

- Procedure 52 "Starting MVC 2050" (page 248).
- Procedure 53 "Synchronizing a PDA with a desktop PC using ActiveSync" (page 250).
- Procedure 54 "Installing MVC 2050" (page 250).
- Procedure 55 "Removing MVC 2050 from your PDA" (page 251).
- Procedure 56 "Enabling Auto-Create" (page 253).

Description

Mobile Voice Client (MVC) 2050 adds wireless IP Phone services to the convenience of Personal Digital Assistants (PDAs). MVC 2050 functions like an IP Softphone 2050. However, MVC 2050 cannot be used as an Agent or Supervisor in Call Center Portal applications.

MVC 2050 is UNISTim-based software that provide real-time voice communication, over a WLAN, to PDAs.

MVC 2050 operates on PDAs running the following operating systems

- Pocket PC 2003
- Windows Mobile 5.0

WLAN 802.11b can interwork with various enterprise communication servers. MVC 2050 can also interwork with WLAN Access Points (WAP) and can use the WSS 2250 WLAN Security Switch. MVC 2050 can coexist with a secure Virtual Private Network (VPN) client on the same PDA.

MVC 2050 requires access to an enterprise or public WLAN Access Point (WAP).

System requirements

MVC 2050 requires PDAs to meet the following *minimum* specifications

- 240x320 screen size
- 624MHz CPU speed
- 64 MB RAM

Supported features

MVC 2050 supports the following telephony features

- six programmable line/feature keys
- four soft keys (self-labeled)
- six specialized feature keys
 - Messages
 - Directory
 - Shift
 - Copy
 - Quit
 - Services
- call-processing keys

- Hold
- Goodbye
- Mute
- Answer
- Expand

- volume Up/Down keys
- navigation keys
- online help
- 12-button dialpad
- multifield display
- audible notification of connection or disconnection to the server
- macro functions available for programming lengthy dialing patterns
Pause is available to build into the macro to introduce a delay which may be required to access some Interactive Voice Response (IVR) applications and voice mail systems.
- Redial List
- Callers List
- profiles
- skins
- connection to user-supplied headsets for the speech path features and services provided by the network (such as call features and voice mail)
- run-in-background application (MVC 2050 interface is closed but the application runs in the background to allow incoming calls)
- 802.11b WLAN interface
- automatic network configuration through DHCP
- G.711 codec for operation without compression

Application software

MVC 2050 is a software application that enables voice communications over a WLAN from a PDA.

The MVC 2050 software application is comprised of the following components

- MVC 2050 software
- NetEQ software (included in MVC 2050 software)

ClearType

MVC 2050 uses a special screen font which requires that Microsoft ClearType® be enabled on your PDA. ClearType software improves the appearance and readability of text on liquid crystal display (LCD), pocket PC screens, and flat panel monitors.

MVC 2050 components

MVC 2050 includes the following components

- MVC 2050 application software, including Global IP Sound NetEQ™ software
- user-supplied compatible PDA
- user-supplied headset

Compatible PDAs

Because the PDA industry evolves at a rapid pace, go to www.nortel.com. Select Products > Phones, Clients, and Accessories > IP Phones and Clients > Mobile Voice Client 2050 > Technical Specifications to determine the latest PDA models tested and supported, along with any known issues.

Headsets

A headset is required in order to send and receive telephone calls using the MVC 2050 and your PDA. The headset is an important part of audio quality.

PDAs that support stereo headphones with microphones are recommended.

The Dell specific headset with a button on the wire, when used with the X51v, allows the MVC 2050 to answer an incoming call or release an active call by pressing the button.

ATTENTION

Bluetooth and 802.11b operate on the same frequency band and use the same WLAN hardware on the PDA. Therefore, the use of Bluetooth accessories with MVC 2050 can lead to poor call quality.

Contact your PDA vendor to obtain headset recommendations.

Automatic Gain Control and feedback

Because MVC 2050 requires a headset to operate properly, disable Automatic Gain Control. Refer to your PDA documentation to disable Automatic Gain Control.

When the PDA is used in handsfree mode, without a headset, the PDA microphone picks up sounds from the speaker, which creates a feedback loop. Automatic Gain Control is used in this instance to avoid feedback.

ATTENTION

When the PDA is used in handsfree mode, without a headset, the PDA microphone picks up sounds from the speaker, creating a feedback loop.

Audio quality

MVC 2050 provides a high-quality audio environment, which includes

- NetEQ software (included with the software package)
- Interworking with G.711 codec that provide high audio quality without compression; MVC 2050 supports G.711-64 A-law and U-law
- Audio selection tab that provide a user-selectable quality slider
- Advanced Audio tab for expert users

For more information about Audio quality, see "[Audio Quality](#)" (page 255).

MVC 2050 Call Handling screen

You can access and operate most MVC 2050 features from the Call Handling screen. Select Answer from the Keys menu or use the Headset/Answer icon to answer calls or obtain a dial tone.

The Call Handling screen contains the telephone dialpad. The appearance of the Call Handling screen differs with each available skin. Use the Settings > Skin dialog box to determine the current skin. All skins share common components.

You can use the up, down, left, and right cursor control arrow keys on your PDA as navigation buttons to navigate around the skin and move through the menu items.

Display

The display is located in the central area of the skin. View messages and text on the display.

Dialpad

The 12-button dialpad is located on the left side of the skin.

Soft keys (self-labeled)

Four soft keys (self-labeled) are located in the bottom row of the display. The labels on these keys depend on the call server.

Programmable line/feature keys

Six programmable line/feature keys are located on the right side of the skin. They are aligned vertically and are the same color as the display. The number of features available depends on the call server.

Menus

MVC 2050 provides the following menus

- File
- Keys
- Help

File

The File menu provides the following items

- Run-in-background
- Paste
- Contacts
- Settings
- Exit

Run-in-background Select Run-in-background to close MVC 2050 but allow it to continue running in the background so that incoming calls can ring on your PDA.

After you complete your call, press the X in the upper right-hand corner of the PDA display to close the MVC 2050 application and return it to the background.

Paste Select Paste to paste a telephone number into your PDA from another application rather than entering an existing telephone number through your Call Handling screen dialpad.

Contacts Select Contacts to launch the Contacts dialog box. The Contacts application reads a list of contacts from the PDA Contacts list or from a list, which you synchronized onto your PDA from Microsoft Outlook.

Settings Select Settings to provide access to the Settings submenu. The Settings menu provides windows for Personal settings, System settings, and Connections settings.

The System settings window provides access to settings for memory, power, remove programs, screen and regional settings, iTask settings, and self test.

You must restart MVC 2050 for changes to Profiles, Hardware ID, Sounds, Servers, and Listener IP to take effect.

Exit Select Exit to close MVC 2050. Calls cannot be received until the application restarts.

Select Exit to free up PDA-processing resources.

Keys

The Keys menu provides the following items

- Headset
- Answer
- Goodbye
- Hold
- Features
- Macros

Headset Select Headset to answer an incoming call or to obtain a dial tone. You can also use the Headset/Answer icon located at the top center of the Call Handling screen.

Answer Select Answer to answer an incoming call or to obtain dial tone to place a call. You can also use the Headset/Answer icon located at the top center of the Call Handling screen.

Goodbye Select Goodbye to end a call. You can also use the Goodbye icon located at the top right of the screen.

Hold Select Hold to place a call on hold. You can also use the Hold icon located at the top left of the screen.

Features Select Features from the Keys menu to access a menu of interface keys.

To re-arrange items in the Features list, open the Settings menu and select the Features tab. Items in the Features list cannot be added or removed.

Macros Select Macros from the Keys > Features submenu to access macros (also available through the Settings > Macros dialog box). Macros are used to make speed-dials, access voice mail, and other routine functions quickly and easily. For more information about macros see "[Macros](#)" ([page 257](#))

Help

Select Help to access the MVC 2050 PDA-specific version of Help. The Help menu provides the following items

- Contents
- Diagnostics

- About MVC 2050

Contents Select the Contents menu item to access the Help system.

Diagnostics Select Diagnostics to access to a list of methods to determine server connection state.

Diagnostic methods are as follows

- Ping
- TraceRoute
- RUDP Ping

See "[Profiles](#)" (page 254) for information about importing and exporting profiles to assist in troubleshooting.

About MVC 2050 About MVC 2050 identifies the MVC 2050 application. Select About MVC 2050 to view configuration information for your MVC 2050 (such as system product name, version number, copyright indication, manufacturer name and logo, and Global IP Sound name and logo). MVC 2050 uses packet loss concealment provided by Global IP Sound NetEQ software.

MVC 2050 graphical interface (skins) components

MVC 2050 provides alternative graphical images known as skins. The dialpad, menu, and icon buttons on the skin. Skins are available in several colors and arrangements.

All skins share the following common components

- programmable line/feature keys
- soft keys (self-labeled)
- dialpad
- display
- Call Handling icons
- Toolbar icons
- Menu Bar icons
- retractable toolbar
- Message Waiting light
- System Input Panel icon

Icons

The MVC 2050 Call Handling screen presents icon equivalents for menu items.

Icons are divided into three types

- Call Handling icons
- Toolbar icons
- Menu Bar icons

Call Handling icons

The following three Call Handling icons appear across the top of the Call Handling screen

- Hold
- Headset/Answer
- Release

Menu Bar icons

MVC 2050 provides the following icons, which is used instead of text menu equivalents

- Paste
- Contacts
- Settings
- Toolbar switch
- System Input icon

Toolbar icons

The retractable toolbar contains icons, which are not present on the remainder of the display. The icons at the bottom of the skin and are visible when the Toolbar is retracted. Use the Toolbar switch icon at the bottom of the screen to retract the Toolbar.

The following are the icons visible on the Toolbar

- Mute
- Volume Down
- Volume Up

The following icons are visible when the Toolbar is retracted

- Mute
- Volume Down
- Volume Up

- Directory
- Messages
- Shift
- Services
- Expand
- Copy
- Quit

System Input Panel

To access the System Input Panel from MVC 2050, tap the System Input Panel icon on the Menu Bar on the bottom right-hand corner of the PDA. Consult the PDA documentation for a description of the System Input Panel.

You can use the System Input Panel to enter data for MVC 2050 and other applications. Use the keyboard to enter data.

The default System Input Panels are as follows

- Block Recognizer
- Keyboard
- Letter Recognizer

The MVC 2050 application enables the keyboard to act like a dialpad, interpreting the alphabetical keys as numbers. For example, J, K, or L, are interpreted as the number five (5). Nonalphanumeric keys are ignored.

Operation

Use [Procedure 52 "Starting MVC 2050" \(page 248\)](#) to start MVC 2050.

Procedure 52 Starting MVC 2050

Step	Action
1	From the Main Application screen, select Programs .
2	Select Start .
3	Select Mobile Voice Client 2050 . The Call Handling screen appears.

—End—

**CAUTION**

PDA processor models, speed, and amount of memory vary. To maintain audio quality, do not overload the processor with intensive tasks while using MVC 2050. For example, Nortel does not recommend using your PDA version of Internet Explorer while using MVC 2050.

PDA processor speed can have adverse effects on MVC 2050 performance.

ATTENTION

Set the PDA processor speed to the highest setting or to auto, which changes the processor speed according to system status. To set the PDA processor speed. Refer to the PDA user guide.

ATTENTION

If the Wireless Fidelity (WiFi) application goes down while your PDA is set to Standby mode, you cannot receive incoming calls on your device. To continue the WiFi application running and receive incoming calls, disable the power settings for Standby mode. Go to the Settings option on your PDA.

PDA battery life can affect the MVC 2050 call duration and the call volume.

ATTENTION

PDA vendors offer two types of rechargeable battery: standard and extended-life. The extended-life battery is recommended. It provides longer call duration and increased call volume than the standard-life battery.

MVC 2050 installation

If an older version of MVC 2050 is installed on the PDA, remove it prior to installing a newer version. See ["MVC 2050 removal" \(page 251\)](#).

To install MVC 2050 on the PDA

1. Place the PDA in its cradle.
2. Synchronize the PDA with a desktop PC running Microsoft® ActiveSync® using [Procedure 53 "Synchronizing a PDA with a desktop PC using ActiveSync" \(page 250\)](#).
3. Install the MVC 2050 from a Desktop using [Procedure 54 "Installing MVC 2050" \(page 250\)](#).

MVC 2050 installation method

MVC 2050 supports installation from a docked PDA with a Microsoft ActiveSync connection to a desktop PC.

Synchronizing a PDA with a desktop PC

Use [Procedure 53 "Synchronizing a PDA with a desktop PC using ActiveSync" \(page 250\)](#) to synchronize your PDA with your desktop PC.

Procedure 53
Synchronizing a PDA with a desktop PC using ActiveSync

Step Action

- 1 Place the PDA in its cradle.
- 2 Ensure that ActiveSync is running.
- 3 Wait for the PDA and the PC to synchronize.

—End—

For details about synchronizing a PDA with a desktop PC, see the PDA Users Manual.

Installing MVC 2050 from a Desktop PC using ActiveSync

Use the following procedure to install MVC 2050 using the product CD.

Procedure 54
Installing MVC 2050

Step Action

- 1 Synchronize the PC and PDA. See [Procedure 53 "Synchronizing a PDA with a desktop PC using ActiveSync"](#) (page 250).
- 2 Insert the MVC 2050 CD into the CD-ROM drive of your desktop PC.
- 3 Go to your desktop and double-click **My Computer**. The PC files and folders menu appears.
- 4 Select the **CD Drive**.
- 5 Select **Setup**.
- 6 Follow the instructions on the screen until the Install Wizard asks you if you want to modify, install, or remove MVC 2050.
- 7 Select **Install**. The Install Wizard installs MVC 2050. When installation finishes, *Attend to your device (PDA)* message displays on the PC and *Do you want to perform a soft restart?* message displays on the PDA.
- 8 Select **Yes** to restart your PDA.

—End—

MVC 2050 removal

Use the following procedure to remove MVC 2050 from your PDA.

Procedure 55

Removing MVC 2050 from your PDA

Step	Action
1	Select Start . A drop-down menu appears.
2	Select Settings . A Windows folder with a number of programs, usually shown as icons with names and a row of tabs across the bottom, opens.
3	Select the <i>System</i> tab. Another Windows program folder opens.
4	Select Remove Programs . A list of programs opens.
5	Select Nortel MVC 2050 .
6	Select Remove . A confirmation dialog box opens.
7	Select Yes . There is a brief pause during removal of MVC 2050. After the pause, a confirmation dialog box opens.
8	Select Yes . Your PDA restarts and MVC 2050 has been removed.

—End—

Configuration

MVC 2050 has a flexible interface which enables end users to customize configurations for a variety of connections.

Settings

For information about settings, see "[Settings](#)" (page 244).

Server

The Server tab, accessible from the Settings screen, contains all the settings necessary for MVC 2050 to contact a server. On the Server tab, you can perform the following

- change the settings on the Server tab to access a different server
- implement the profile containing the desired server

For more information about Profiles, see "[Profiles](#)" (page 254).

Connection history

Connection history writes connection and disconnection indication messages to the registry key *HKCU\Software\Nortel\MVC2050\Log*. This is a circular queue of 29 entries. Each time a connection or disconnection event occurs, a log entry containing a date, time, and a description of the connection or disconnection event is written.

The descriptions of the connection and disconnection events are as follows

- Soft reset, server *n*
- Server connected
- Recovering: Server unreachable
- Hard reset
- Hardware ID

Soft reset, server *n* **Server *n*** indicates that the server has instructed MVC 2050 to reset and connect to a server *n* where *n* and its value is determined, and possibly written, by the server. This message maps directly to a UNISlim message.

Server connected **Server connected** indicates that MVC 2050 has successfully connected to the server. It means that MVC 2050 received the *Assign TerminalID* UNISlim message, which is the last message received by MVC 2050 before a normal session is started.

Recovering: Server unreachable The Recovering: Server unreachable message generates after MVC 2050 loses connection with the server. It indicates that the UNISlim watchdog timer has expired and indicates loss of network connection.

Hard Reset The Hard Reset message indicates that the server has instructed MVC 2050 to reset and clear its UNISlim-related memory. This message maps directly to a UNISlim message.

Hardware ID

The Hardware ID screen is used to select the MAC address that MVC 2050 reports to the communication server. The MAC address can be reset.

View the Hardware ID in the MVC 2050 Settings on the Hardware ID tab.

Hardware IDs are generated by reading MAC addresses from the PDA Network Interface Card (NIC). When MVC 2050 is used with most server types, the Hardware ID must be unique.

Some software, such as VPN client software, creates artificial network interfaces with MAC addresses, which are not unique. Without a unique MAC address, the following conflicts can occur

- MVC 2050 cannot connect to a server
- MVC 2050 connects to the server but another device with the same Hardware ID is disconnected from the server
- MVC 2050 disconnects from the server then automatically attempts to reconnect

To prevent conflicts with other devices, enable Auto-Create. Auto-Create fabricates a MAC address with a random value that is unlikely to be repeated by another device.

Use [Procedure 56 "Enabling Auto-Create" \(page 253\)](#) to enable **Auto-Create**.

Procedure 56
Enabling Auto-Create

Step Action

- 1 Select **Settings**.
- 2 Select **Hardware ID**.
- 3 Select **Auto-Create**.

—End—

[Table 32 "Hardware ID screen" \(page 253\)](#) provides information about the Hardware ID screen.

Table 32
Hardware ID screen

Selection	Description
Hardware ID	This box contains the MAC address for the Ethernet hardware installed in your device. MVC 2050 uses the MAC address of the Ethernet hardware as its hardware ID. You may have to change this value if there is more than one MAC address, or if the device is using an extranet client that hides the true MAC address. For example, the Nortel Contivity Extranet Switch uses

Selection	Description
	a single MAC address for all clients. This might cause connection problems with your communication server.
Auto-create	This changes the MAC address that appears in the Hardware ID box. If your device has more than one MAC address, tap the Auto-Create button to cycle through the set of MAC addresses on your computer. Auto-Create also makes up random hardware IDs in case the Ethernet hardware addresses are not unique to the communication server.
Firmware Version	Shows the build number of MVC 2050 installed on your device. This value is the version number of the application last reported by the server.

Dialing formats

Dialing Locations settings set the dialing rules to be applied to properly route a call when an end user dials a number. The dialing rules establish prefixes to access local and long-distance numbers using the location of the user server. To establish the dialing rules and dialing patterns, see *Mobile Voice Client 2050 User Guide (NN43119-103)*.

Profiles

Each profile is a named file, which contains a combination of servers and other attributes that control connection, behavior, and appearance of the MVC 2050.

A number of profiles can be created and saved to allow easy switching among different servers, feature programming, and audio programming.

Profiles can be created, selected, modified, or deleted. When you select profile you can change the name, modify it, or delete it.

When a profile is selected, all other Settings tabs see the selected profile. The name of the selected profile is shown in the lower right corner on each tab.

From the Profiles screen you can do the following

- create profiles
- delete profiles
- modify a profile name
- change the profile used by the application
- export profiles

- import profiles

When a new profile is created and selected, the values on all of the other tabs are set to the defaults for this profile. Any value modified on any of the other tabs are associated with this profile until another profile is selected. To change settings on other tabs for this profile, select the tab you wish to change. For example, go to the Server tab to modify the server settings.

Sounds

MVC 2050 can make sounds to indicate server connection or disconnection.

Sound files and sound settings are not saved when Profiles are saved, so the user must program the sounds. Up to three sounds can be programmed for use with audible notification of server connection or disconnection.

Following are descriptions of the events for which the sounds are used.

Descriptions of the events for which the sounds are used are as follows

- Server unreachable
- Server unresponsive
- Server connected

Server unreachable The sound you select for this event plays when MVC 2050 loses contact with the server. The message "Server unreachable" displays on the PDA screen.

Server unresponsive The sound you select for this event plays if MVC 2050 fails to connect to the server. The message *Server unresponsive* displays on the PDA screen.

Server connected The sound you select for this event plays when MVC 2050 connects to a server.

Audio Quality

Audio quality is controlled from the following screens

- Audio quality slider tab
- Advanced Audio

Audio quality slider tab To control audio quality, use the slider tab to reduce audio delay and increase audio clarity. control audio quality. This slider controls the number of audio buffers the PDA uses to smooth out incoming audio streams.

If you experience audio delay, use the slider on the Audio screen to decrease the number of buffers.

If you experience broken or choppy speech at either end of the call, or the dial tone sounds choppy, use the volume controls on the MVC 2050 toolbar to adjust volume while using the MVC 2050.

If you experience reduced audio clarity in the receive audio stream, increase the Audio clarity setting. This increases the number of audio buffers used to process incoming audio. If the delay is too large, you can decrease the Audio clarity setting.

Advanced Audio Global IP Sound NetEQ software provides loss concealment and compensation.

NetEQ is the default setting and MVC 2050 Advanced Audio settings cannot be adjusted.

Table 33 "Advanced Audio screen" (page 256) provides information about the Advanced Audio screen.

Table 33
Advanced Audio screen

Selection	Description
NetEQ (Global IP Sound)	NetEQ packet loss concealment software is the default mode of operation.
Jitter Buffer	A Jitter Buffer is used to minimize a change in rate for arriving voice frames. The Jitter Buffer sends voice frames to your PDA sound system at a fixed rate. The rate of arrival of voice frames is variable. The value of "jitter" is the normal number of voice frames the application should have in its jitter buffer.
Highwater Mark	Highwater Mark indicates the maximum number of voice frames the application should have in its jitter buffer before it starts discarding packets. This value should be at least 2.5 times the value of jitter. If a smaller value is assigned, MVC 2050 regards it as an error and corrects it.
Early Packet and Late Packet Resync	Early Packet Resync and Late Packet Resync indicate the points at which MVC 2050 discards and restarts the jitter buffer contents. This value should be at least five times the Highwater Mark.

Listener IP

Use the Listener IP screen to override the port assignments when there is a conflicting application on the PDA.

See [Table 34 "Listener IP screen" \(page 257\)](#) for information about selections available on the Listener IP screen .

Table 34
Listener IP screen

Selection	Description
Use a specific address	MVC 2050 normally listens to all IP addresses on the device for communication server-to-terminal (UNISim) messaging on all the network interface cards on the device. This is the default mode of operation. To override this behavior, select the check box and enter a specific IP address.
Use a specific port	MVC 2050 listens to IP port 5000 on the device for communication server-to-terminal (UNISim) messaging.

Macros

The Mobile Voice Client (MVC) 2050 **Macros** tab enables you to record and use macros. A macro is a recorded sequence of steps that saves you keystrokes.

For example, you can create macros that select a particular line and then dials the telephone number automatically, or program voice mail access numbers and codes for faster access.

Macro screen To enter a new macro name, or to select an existing macro to modify or delete, select the New icon to the right of the list box.

To select an existing macro, tap the down arrow in the Macro list box and make your selection.

To delete a selected macro, tap the Delete icon (the button to the right of the list box).

Keys Once you have selected a macro name, tap the down arrow in the **Keys** drop-down list to select a key to add to the macro. Press the **Add** button to add the key.

Use the Pause key to insert a short pause in the macro. A pause introduces a delay which may be required to access some Interactive Voice Response (IVR) applications and the voice mail systems.

Contents A list of the macro contents appears in the Contents list box. Once there are two or more entries in this box, use the up and down buttons, which appear on the right of the box to move around the keystrokes.

To remove keystrokes from the Contents box, select the keystroke and press the Remove button.

Preview To preview your macro in a single view, view the read-only field under the Contents box.

Dialpad To enter numbers into your macro, select the Keys list box, press the Add button, or use the numbers on the dialpad.

MVC 2050 and WLAN

802.11b wireless ethernet networking

MVC 2050 uses an 802.11b WLAN interface.

Audio quality is affected by the distance from the AP and enclosed spaces. Audio quality is also affected by using Bluetooth accessories while on a voice call due to interference and contention.

QoS

Due to device constraints, 802.11 p/q is not supported.

Wireless Fidelity

ActiveSync of a PDA with a PC can be accomplished using Wireless Fidelity (WiFi).



CAUTION

When you return the PDA to its cradle, if you want to maintain the MVC 2050 connection to the server, deactivate ActiveSync. Otherwise the connection is lost because ActiveSync uses Point-to-Point Protocol (PPP). This causes the PDA connection to the voice network to be dropped and connected to the PC.

Roaming and handover

If you experience slight gaps and pauses in transmission and reception during calls, MVC 2050 may be experiencing roaming/handover difficulties attributable to the wireless network.

Nortel IP Phone 1110

Contents

This section contains the following topics:

- "Introduction" (page 259)
- "Description" (page 260)
- "Components and functions" (page 261)
- "Supported features" (page 264)
- "Features not currently supported" (page 266)
- "Display characteristics" (page 266)
- "Cleaning the IP Phone display screen" (page 267)
- "Local Tools menu password protection" (page 267)
- "Key number assignments" (page 269)
- "Package components" (page 270)
- "Installation and configuration" (page 271)
- "Full Duplex mode" (page 293)
- "TFTP firmware upgrade " (page 295)
- "Gratuitous Address Resolution Protocol Protection" (page 295)
- "Extensible Authentication Protocol " (page 295)
- "Redeploying an IP Phone 1110" (page 296)
- "Replacing an IP Phone 1110" (page 297)
- "Removing an IP Phone 1110 from service" (page 297)

Introduction

This section explains how to install and maintain the IP Phone 1110. For information about using the IP Phone 1110, see the *IP Phone 1110 User Guide (NN43110-101)* or the *IP Phone 1110 Getting Started Card (NN43100-300)*.

This section contains the following procedures

[Procedure 57 "Configuring the IP Phone 1110 "](#) (page 272)

[Procedure 58 "Installing the IP Phone 1110 for the first time using manual configuration"](#) (page 279)

[Procedure 59 "Installing an IP Phone 1110 for the first time using DHCP"](#) (page 286)

[Procedure 60 "Enabling Full Duplex mode"](#) (page 294)

[Procedure 62 "Changing the TN of an existing IP Phone 1110"](#) (page 296)

[Procedure 63 "Replacing an IP Phone 1110"](#) (page 297)

[Procedure 64 "Removing an IP Phone 1110 from service"](#) (page 297)

Description

The IP Phone 1110 uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 1110 translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 1110 network connection, and Communication Server 1000 connection.

[Figure 25 "IP Phone 1110"](#) (page 261) shows the IP Phone 1110.

Figure 25
IP Phone 1110



Components and functions

This section describes the following components and functions of the IP Phone 1110

- Keys and functions
- Services menu
- Local Tools menu

Keys and functions

Table 35 "IP Phone 1110 keys and functions" (page 262) describes the IP Phone 1110 keys and functions.

Table 35
IP Phone 1110 keys and functions

Key	Function
Line key	Press the Line key to access the single DN and make a call.
Hold	Press the Hold key to put an active call on hold. Press the green Line (DN) key to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Visual Alerter/Message waiting indicator	When a message is waiting, the red Visual Alerter/Message waiting indicator lights. Also, when the ringer sounds, this indicator flashes.
Feature Status Lamp indicator	When the firmware is updating, the blue Feature Status Lamp indicator flashes. This function requires server support and, therefore, is not available on all phones.
Context-sensitive soft keys	Soft keys are located below the display area. The LCD label above the key changes, based on the active feature. A triangle before a key label indicates that the key is active.
Expand	The Expand key is used to access external server applications, such as External Application Server (XAS). The Expand key is reserved for future feature development.
Navigation keys	Use the Navigation keys to scroll through menus and lists that appear on the LCD display screen. The outer part of this key cluster rocks for up, down, left, and right movements. Use Up and Down keys to scroll up and down in lists, and the Left and Right keys to position the cursor. You can also use the Left and Right keys to select editable fields that appear on the phone. Press the Right key to select the field below the current position, or press the Left key to select the field above the current position.
Enter	Press the Enter key, at the center of the Navigation key cluster, to confirm menu selections. In many cases, you can use the Enter key instead of the Select soft key.

Key	Function
Message/Inbox	Press the Message/Inbox key to access your voice mailbox.
Volume control keys	<p>Press the volume control keys to adjust the volume of the handset, headset, speaker, ringer, and, Handsfree feature.</p> <p>Press the volume key with the loudspeaker icon to increase volume; press the volume key without the loudspeaker icon to decrease volume.</p>

Services menu

Table 36 "Services menu" (page 263) shows the Services menu.

Table 36
Services menu

Services	<p>Press the Services key to access the following items</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language — Date/Time — Display diagnostics — Local Dialpad Tone — Set Info — Diagnostics — Call Log Options — Ring type — Call Timer — Live Dialpad • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured) • Password Admin <p>The user can originate a call using Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID information, and Autodial and Last Number Redial intercept the dialpad.</p>
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Local Tools menu

Table 37 "Local Tools menu" (page 264) shows the Local Tools menu.

Table 37
Local Tools menu

<p>Press the Services key twice to access the Local Tools menu. The following items appear in the Local Tools menu</p> <ol style="list-style-type: none">1. Preferences2. Local Diagnostics3. Network Configuration4. Lock Menu <p>If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see "Local Tools menu password protection" (page 267)</p> <p>To make a selection, press the number associated with the menu item, or use the navigation keys to scroll through the menu items. Press the Enter key to select the highlighted menu item.</p> <p>Press the Quit/Stop key to exit from any menu or menu item.</p>
--

Supported features

The IP Phone 1110 supports the following telephony features

- four context-sensitive soft keys
Functions for the context-sensitive soft keys are configured in LD 11.
- volume control keys to adjust ringer, listen-only speaker, and handset volume
- two specialized feature keys
 - Message/Inbox
 - Services
- four call-processing fixed keys
 - Line key
 - Goodbye
 - Expand—reserved for future feature development
 - Hold

- Call Duration Timer
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download

The IP Phone 1110 supports the following data network features

- integrated 10/100BT Ethernet switch for shared PC access
 - the LAN Ethernet port supports 10/100BT Mb/s Full Duplex mode
 - the PC Ethernet port supports 10/100BT Mb/s Full Duplex mode
- automatic network configuration through DHCP.
For more information about automatic network configuration, see [Table 39 "IP Phone 1110 IP parameters" \(page 278\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP).
For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption.
For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).
- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone for VLAN and priority tagging for PC and IP Phone traffic
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.
- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN
For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).
- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 2
- Gratuitous Address Resolution Protocol (GARP) Protection

The IP Phone 1110 supports the following user interface features

- Hearing Aid Compatibility (HAC) as per FCC Part 68
- language support: English, French, Greek, Swedish, Danish, Norwegian, German, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana

Features not currently supported

The following features are not supported on the IP Phone 1110

- Group Listening
- Set-to-Set messaging
- Headset
- Callers List
- Redial List
- Personal Directory
- Corporate Directory
- Expansion Module for IP Phone 1100 Series
- Call status indicator

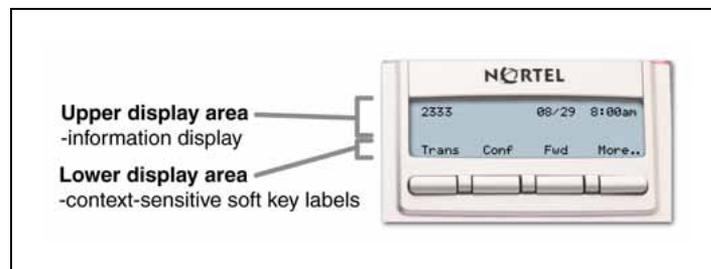
Display characteristics

An IP Phone 1110 has two major display areas

- context-sensitive soft key label
- information line

Figure 26 "IP Phone 1110 display area" (page 266) shows the two display areas.

Figure 26
IP Phone 1110 display area



Context-sensitive soft key label display

The context-sensitive soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state. Use the More soft key to navigate through the layers of functions. If only four functions are assigned to the soft keys, the More key does not appear and all four functions are displayed.

Information line display

An IP Phone 1110 has a one-line information display area with the following information

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state), or Call Timer (if provisioned in the Telephone options menu)

The information in the display area changes, according to the call-processing state and active features.

Cleaning the IP Phone display screen

Gently wipe the IP Phone display with a soft, dry cloth.

ATTENTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Local Tools menu password protection

If the SECUREMENU parameter was set during Full DHCP configuration, the Local Tools menu is locked to prevent accidental or unwanted changes. You are prompted to enter the fixed password 26567*738 (color*set) whenever the Services key is double-pressed, or whenever the Local Diagnostics and Network Configuration sub menus are accessed.

If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access 2. Local Diagnostics, or 3. Network Configuration menu items from the Local Tools menu. You are always prompted to enter the fixed password whenever you access the 4. Lock Menu sub menu.

Two ways to control the menu lock are as follows

- DHCP Secure Menu option—the IP Phone processes the secure menu setting retrieved from the Full DHCP response.
- Lock Menu option—double-press the Services key to access the Local Tools menu. Press 4 on the dialpad to access the Lock Menu items, or use the up/down navigation keys to scroll and highlight one of the following Lock Menu options
 - 1. Manual Secure Local Menu
 - 2. Manual Partial Secure Menu
 - 3. Manual Disable Secure Menu
 - 4. DHCP Secure Menu
 - 5. Lock Now

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

For more information about 4. Lock Menu manual user settings, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Configuring Secure Local Menu through Full DHCP

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECURE parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECURE parameter is present, password protection is not enabled.

The SECUREMENU/PARTSECURE item is an optional parameter. If it is present, then the full S4 string needs to be present, including the action and retries. The S4 string is already present if the XAS support has been configured through the DHCP. If XAS is not configured, you can still enable password protection by setting the S4 IP address to 0.0.0.0 and by setting the other fields to 0.

ATTENTION

With Full DHCP, the vendor-specific or site-specific options must be configured depending on the customers DHCP server configuration.

For further information about configuring Full DHCP, see *Data Networking for VoIP* (NN43001-260).

Accessing the Local Tools menu

After you enter the password, the Local Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Local Tools menu without being prompted to reenter the password. To reset the timer before the 5-minute time expires, double-press the Services key.

You can also press the 5 key to select the Lock Now item from the Lock Menu. The Lock Now item immediately exits the Local Tools menu, closes any open Local Tools menu pages, and locks the Local Tools menu. Alternatively, when time expires, the Local Tools menu and any open submenus are closed. Double-press the Services key to open the password prompt window to reaccess the Local Tools menu.

If you enter an incorrect password, the Local Tools menu does not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5-minute time expires.

Depending on the current state of the menu lock and the configuration of the IP Phone, some items appear with a black box at the beginning of the menu item. Only configuration options that are enabled from the current state appear active. Menu options that are not available appear with a black box.

For more information about configuring the Local Tools menu for the IP Phone 1110, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined context-sensitive soft keys. Because the context-sensitive soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the context-sensitive soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four context-sensitive soft keys. Labels for the context-sensitive soft keys appear in the display area. For further information, see [Figure 26 "IP Phone 1110 display area" \(page 266\)](#).

["Context-sensitive soft key label display" \(page 267\)](#) shows the IP Phone 1110 display area.

Key number mappings at the Call Server align with the IP Phone 2001.

For a description of the IP Phone function assignment for each of the context-sensitive soft keys, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The IP Phone 1110 includes integrated support for a number of Power over Ethernet options, including support for IEEE 802.3af Power Classification 2.

[Table 38 "IP Phone 1110 components list" \(page 270\)](#) lists the IP Phone 1110 package components and product codes.

Table 38
IP Phone 1110 components list

IP Phone 1110 package contents include		
<ul style="list-style-type: none"> • IP Phone 1110 • handset • handset cord • 2.1 m (7-ft.) CAT5 Ethernet cable • Number plate and lens • Getting Started Card 		
IP Phone 1110 with icon key caps, without power supply (RoHS)		NTYS02AAE6
IP Phone 1110 with English key caps, without power supply (RoHS)		NTYS02BAE6
Replacement parts		
Handset, Charcoal		NTYS09AA70
Handset cord, Charcoal		NTYS10AA70
Footstand kit, Charcoal (includes the stand and stand cover)		NTYS11AA70
Phone number label and lens kit		NTYS12AA
2.1 m (7-ft) CAT5 Ethernet cable		NTYS13AA
Power adapter		
Global power supply (for local power)		N0089601
IEC cables	RoHS	Non-RoHS
1.8 m (5.9 ft), 10 amp, IEC320-C13 North America Nortel recommends you use the thinner cord (NTYS14AA) as an alternative to NTTK14AB.	NTYS14AAE6	NTYS14AA
3 m (9.9 ft), 125 VAC 13 amp, NA power cord, NEMA North America, Middle East, Taiwan, Philippines, Thailand, and Japan	NTTK14ABE6	NTTK14AB

2.4 m (8 ft), 240 VAC 10 amp, ANZ power cord AS-3, Australia, New Zealand	N/A	NTTK15AA
250 VAC, Option 11C Standard European power cord, Other EMEA, Kenya, Korea, Thailand, Indonesia, Vietnam, India, Pakistan	NTTK16ABE6	NTTK16AB
3 m (9.9 ft) 125 VAC, Option 11C Swiss power cord Switzerland	NTTK17ABE6	NTTK17AB
240 VAC, Option 11C UK power cord Hong Kong, Ireland, United Kingdom, Singapore, Malaysia, Bangladesh, Brunei, Sri Lanka	NTTK18ABE6	NTTK18AB
3 m (9.9 ft), 125 VAC, Option 11C Denmark power cord Denmark	NTTK22ABE6	NTTK22AB
Argentina	N/A	A0814961
1.8 m (5.9 ft), 10 amp, IEC320-C13 Japan	NTTK26AAE6	N/A

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 1110

- Before you begin
- First-time installation
- Configuring the IP Phone 1110
- Startup sequence
- Installing the IP Phone 1110

Before you begin

Before installing the IP Phone 1110, complete the following pre-installation checklist

- Ensure one IP Phone 1110 boxed package exists for each IP Phone 1110 being installed. The package contains
 - IP Phone 1110
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - number plate and lens
 - Getting Started Card
- Ensure 1 Software License exists for each IP Phone 1110 being installed.

- Ensure the host Call Server is equipped with a Signaling Server that runs the Line TPS application.
- If an AC power adapter is required, ensure the approved Nortel AC adapter (model number N0089601) is used. See [Table 38 "IP Phone 1110 components list"](#) (page 270).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Do not plug your IP Phone 1110 into an ISDN connection. Severe damage can result.

Configuring the IP Phone 1110

You must configure the IP Phone 1110 before you can use it. Use Procedure 58 to configure the IP Phone 1110 for the first time.

Procedure 57

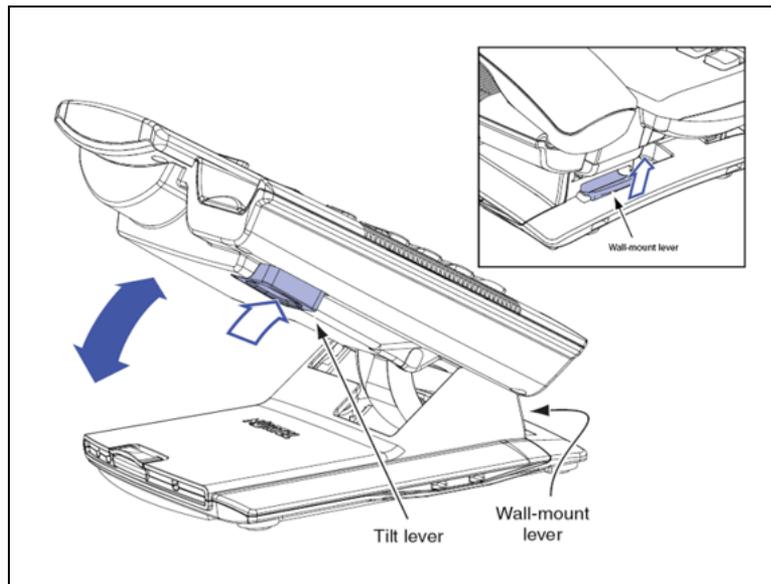
Configuring the IP Phone 1110

Step	Action
1	Configure a virtual loop on the Call Server using LD 97. For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i> .
2	Configure the IP Phone 1110 on the Call Server using LD 11. At the prompt, enter the following <code>REQ: chg</code> <code>TYPE: 1110</code> For more information about configuring the IP Phone 1110 using LD 11, see <i>Software Input Output Administration (NN43001-611)</i> .

**CAUTION**

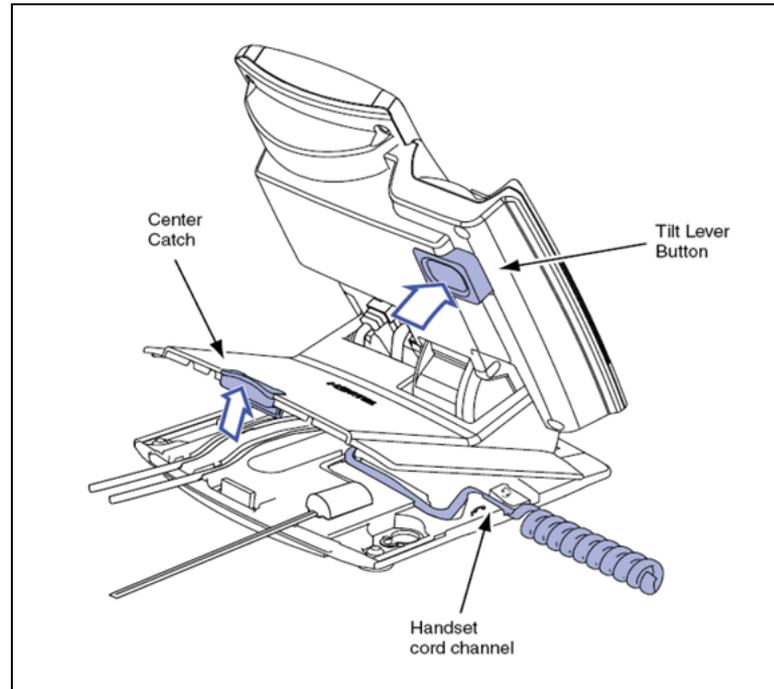
The IP Phone 1110 is shipped with the stand and stand cover locked in position. To avoid damaging the IP Phone, press the wall-mount lever to release the stand and pull it away from the base using the tilt lever. See [Figure 27 "Release the IP Phone 1110 from the stand"](#) (page 273). To release the stand cover, see and [Figure 28 "Stand cover removed"](#) (page 274).

Figure 27
Release the IP Phone 1110 from the stand



- 3** Pull upward on the center catch and remove the stand cover, as indicated in [Figure 28 "Stand cover removed"](#) (page 274). The cable routing tracks are now accessible.

Figure 28
Stand cover removed



- 4 Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable, and then thread the adapter cord through the channels in the stand.



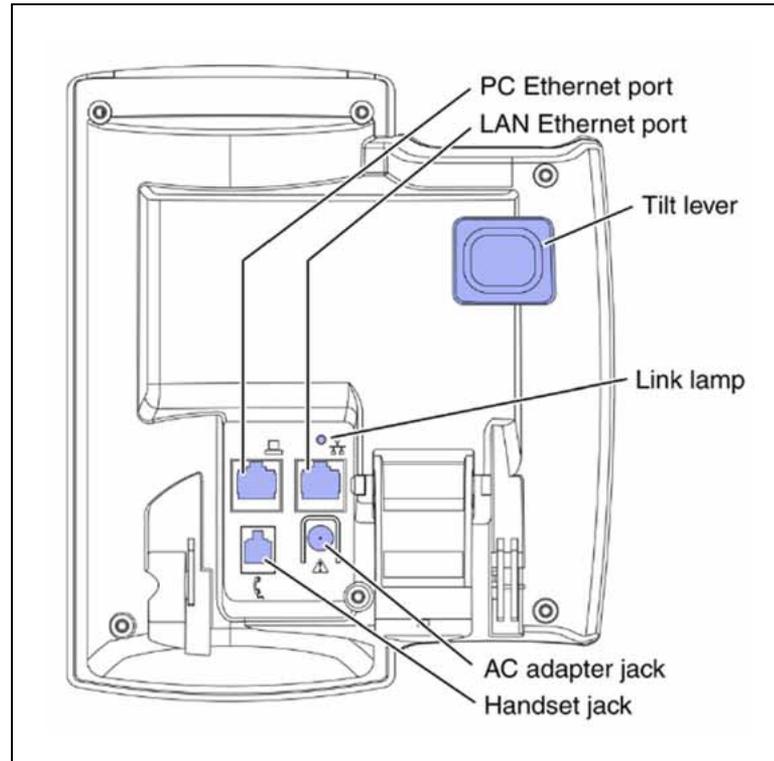
WARNING

Use your IP Phone 1110 with the approved Nortel AC adapter (model number N0089601).

The IP Phone 1110 supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 2. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

Figure 29 "IP Phone 1110 connections" (page 275) shows the IP Phone 1110 connections.

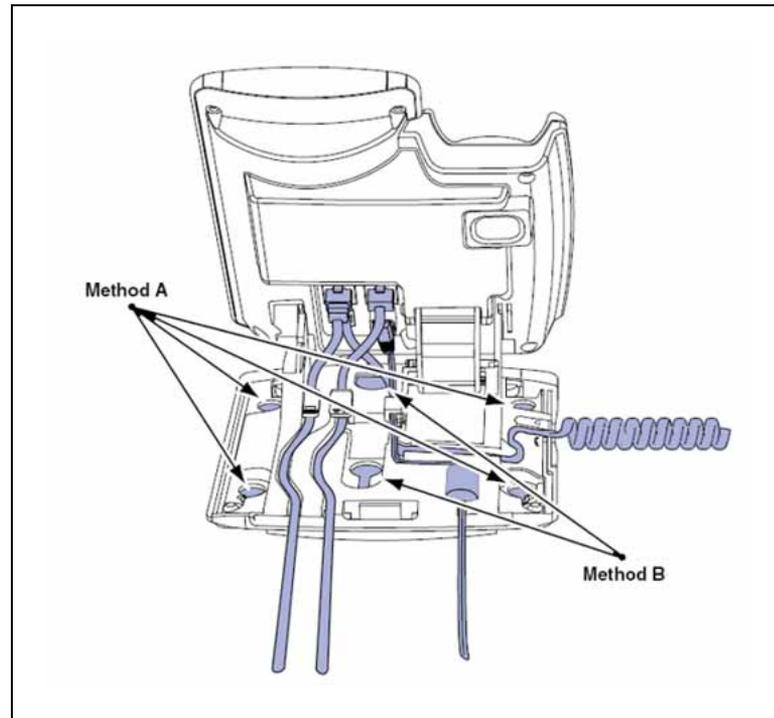
Figure 29
IP Phone 1110 connections



- 5 Install the handset. Connect the end of the handset cable with the short straight section into the handset. Connect the end of the handset cable with the long straight section to the back of the phone, using the RJ-9 handset jack. Form a small bend in the cable, and then thread the handset cord through the channels in the stand so that it exits behind the handset on the right side, in the channel exit in the stand base. See [Figure 30 "Cable routing tracks"](#) (page 276).

Although a headset cord channel appears on the base of the IP Phone 1110, the IP Phone 1110 does not support a headset port.

Figure 30
Cable routing tracks



- 6 Install the Ethernet cable. Connect one end of the supplied Ethernet cable to the back of your phone using the CAT5 cable (not provided), and thread the network cable through the channel.
- 7 If you are connecting your PC through the phone a second CAT5 cable is required. Only one cable is included with the IP Phone 1110 package. Connect one end of the PC Ethernet cable to your phone using the CAT5 connector (PC Ethernet port), and thread it through the channel. Connect the other end to the LAN connector on the back of your PC.



CAUTION

Damage to Equipment

Do not plug any device into your IP Phone 1110 Ethernet port other than one PC. The IP Phone 1110 does not support multiple devices connected through the PC Ethernet Port.

Complete steps 1 to 9, as needed, before wall-mounting the IP Phone.

- 8 Wall-mount your phone (optional). Use Method A or Method B to wall-mount the IP Phone. See Method A—using the mounting

holes on the bottom of the phone stand, or Method B—using the traditional-style wall-mount box with a CAT5 connector and a 15 cm (6 inch) CAT5 cord (not provided). See [Figure 30 "Cable routing tracks"](#) (page 276).

- Method A: Press the wall-mount lever, and pull away from the stand. Using the stand cover (see step 3), mark the wall-mount holes by pressing the bottom of the stand cover firmly against the wall in the location where you wish to install the phone. Four small pins on the bottom of the stand cover make the marks on the wall. Use the marks as a guideline to install the wall-mount screws (not provided).

Install the screws so that they protrude 3 mm (1/8 inch) from the wall, and then install the phone stand mounting holes over the screw heads. You may need to remove the phone from the wall to adjust the lower screws. When the lower screws are snug, install the phone on the mounting screws, and then tighten the top screws.

- Method B: Attach the 15 cm (6 inch) CAT5 cable (not provided), position the stand over the mounting rivets, and slide the phone down the wall so that the rivets fit into the slots on the stand.

- 9 Replace the stand cover. Ensure that all cables are neatly routed and press the stand cover into place until you hear a click.
- 10 If you wall-mount the phone, put it in the wall-mount position by holding the tilt lever and press the phone towards the base until the phone is parallel with the base. Release the tilt lever and continue to push the phone towards the base until you hear an audible click. Ensure the phone is securely locked in to position.
- 11 Connect additional cables. Connect the Ethernet cable to the LAN Ethernet connection. If you are using an AC power adapter, plug the adapter into an AC outlet.

—End—

Startup sequence

When an IP Phone 1110 connects to the network, it must perform a startup sequence. The elements of the startup sequence include

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 39 "IP Phone 1110 IP parameters" \(page 278\)](#) for a summary of the IP parameters and how they are obtained.

Table 39
IP Phone 1110 IP parameters

Parameter	Method of acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically obtained through Partial or Full DHCP.
Net Mask	Manually entered or automatically obtained through Partial or Full DHCP.
Default Gateway Address	Manually entered or automatically obtained through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically obtained through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Obtained from local storage on subsequent power cycles.

Installing the IP Phone 1110

To install the IP Phone 1110, use the following procedures

- Installing the IP Phone 1110 for the first time using manual configuration
- Installing the IP Phone 1110 for the first time using DHCP

Installing the IP Phone 1110 using manual configuration

ATTENTION

Timing information

There are approximately 30 seconds between plugging in the IP Phone 1110 power adapter and the appearance of the text Nortel. When you see the text Nortel on the phone, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 1110 attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the Local diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 267\)](#).

To edit network configuration, the following soft keys are available

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry
- Cancel—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 58

Installing the IP Phone 1110 for the first time using manual configuration

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select No , you are not prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451) .
4	At the prompt, LLDP Enable? , enter 1-Y (1 for Yes, default). For more information about LLDP, see Appendix "802.1ab Link Layer Discovery Protocol" (page 453) . For more information about 802.1Q, see Appendix "802.1Q VLAN description" (page 443) .
5	At the prompt DHCP Yes/No? , enter 0-N (0 for No). By default, Full DHCP is configured on the IP Phone 1110. Depending on the configuration requirements, you can change the IP Phone 1110 configuration to allow the following IP address assignments <ul style="list-style-type: none"> • Static—enter all parameters • Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server • Full DHCP— (default) all parameters are obtained from the DHCP server

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration. For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

6 Enter the following information.

Screen prompt	Description
set IP	a valid IP Phone 1110 IP address.
net msk	a subnet mask.
def gw	the default Gateway for the IP Phone 1110 on the LAN segment to which it connects.

7 Enter the information for the primary Connect Server (S1) and the secondary Connect Server (S2).

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 1110.
S1 Port	This is a fixed value: 4100.
S1 action	Choose one of the following: <ul style="list-style-type: none"> • for TPS only, enter 1. • for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	The number of times the IP Phone 1110 attempts to connect to the server. Enter 10.

Screen prompt	Description
S1 PK	<p>Default is ffffffffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
S2 IP	The secondary CS 1000 node IP address for the IP Phone 1110.
S2 Port	Same as S1.
S2 action	Same as S1.
	You are not prompted for S2 PK if S2 Action is set to 1.
S2 retry count	Same as S1.
S2 PK	<p>Default is ffffffffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	<p>Default 0 (for No).</p> <p>If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.</p>
XAS IP:	<p>Enter the IP address of the XAS server.</p> <p>The IP Phone 1110 currently does not support XAS.</p>

Screen prompt	Description
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed. Default 0 (for Auto) 0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>
802.1Q (0-No, 1-Yes)	<p>Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.</p>
Voice VLAN? (0-N, 1-Y)	<p>Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.</p>
VLAN Cfg? 0-Auto, 1-Man:	<p>Default 0 (for Auto).</p> <p>You are not prompted for VLAN Cfg if Voice VLAN is not enabled.</p> <p>0-Auto Automatically obtains VLAN ID using DHCP or the 802.1ab data switch.</p> <p>1-Man Enter the VLAN ID manually. This is a number from 1 to 4094.</p>
LLDP-MED? (0-No, 1-Yes)	<p>If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV.</p> <p>You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.</p>

Screen prompt	Description
LLDP VLAN? (0-No, 1-Yes)	If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV.
DHCP (0-No, 1-Yes)	You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled. If you select 1-Y (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.
VLANFILTER (0-N, 1-Y)	You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled. Default 0 (for No).
Ctrl pBits (0-7, 8-Au)	You are not prompted for VLANFILTER if VLAN is not enabled. Default 8 (for Auto). You are not prompted for Ctrl pBits if 802.1Q is not enabled.
Media pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Media pBits if 802.1Q is not enabled.
PC Port? (0-Off, 1-On)	Default 1 (for On).
Speed (0-A, 1-10, 2-100)	Default 0 (for Auto). 0 = Auto 1 = 10 BT 2 = 100 BT
Duplex (0-A, 1-F, 2-H)	You are not prompted for Speed if PC Port is set to 0 for Off. Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half
	You are not prompted for Duplex if PC Port is set to 0 for Off and if Speed is set to 0 for Auto.

Screen prompt	Description
Data 802.1Q (0-N, 1-Y)	You are not prompted for Data 802.1Q if PC Port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.
Data VLAN Cfg? (0-Auto, 1-Man)	Default 1 (for Man) You are not prompted for Data VLAN Cfg if LLDP or Data VLAN are not enabled and PC Port is set to 0 for Off. If you select 0 (for Auto), VLAN ID is automatically configured to the value received in the VLAN NAME TLV.
Data VLAN ID:	You are not prompted for Data VLAN ID if Data VLAN is set to 0 for Auto.
Data pBits (0-7, 8-Au)	Default 8 (for Au). You are not prompted for Data pBits if the PC Port is set to 0 for Off or if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0-No, 1-Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 1110 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 1110 searches for the TFTP Server for firmware upgrade. If the file name specified in 1110.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 1110 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 1110 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 1110 saves the configuration and then reboots. The IP Phone 1110 searches for the connect server.

- 8 The IP Phone 1110 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When registration is complete, the IP Phone 1110 resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 9 Check for a dial tone and the correct DN above the display.

—End—

Installing the IP Phone 1110 using Full DHCP

Use [Procedure 59 "Installing an IP Phone 1110 for the first time using DHCP" \(page 286\)](#) to install the IP Phone 1110 for the first time using DHCP.

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 267\)](#).

To edit network configuration, the following soft keys are available

- OK—accept current settings and proceed to the next configuration option. If all configuration options are presented, the configuration is saved and the IP Phone reboots with the saved changes.
- BkSpace—erase a configuration entry to change it
- Clear—clear an entire configuration entry

- **Cancel**—cancels network configuration. The IP Phone reboots without saving changes.

Procedure 59

Installing an IP Phone 1110 for the first time using DHCP

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right.
2	At the prompt EAP Enable? , enter 1-Yes (1 for Yes) if the network infrastructure supports 802.1x port-based network access control.
3	Enter DeviceID and Password. If you select No , you are not be prompted to enter Device ID and Password. For more information about EAP, see Appendix "802.1x Port-based network access control" (page 451) .
4	At the prompt, LLDP Enable? , enter 1-Y (1 for Yes, default). For more information about LLDP, see Appendix "802.1ab Link Layer Discovery Protocol" (page 453) . For more information about 802.1Q, see Appendix "802.1Q VLAN description" (page 443) .
5	At the prompt DHCP Yes/No? , enter 1-Y (1 for Yes). By default, Full DHCP is configured on the IP Phone 1110. Depending on the configuration requirements, you can change the IP Phone 1110 configuration to allow the following IP address assignments <ul style="list-style-type: none"> • Static—enter all parameters • Partial DHCP—IP Phone address, subnet mask, and default Gateway are obtained from the DHCP server • Full DHCP— (default) all parameters are obtained from the DHCP server A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration. For more information about how to set up DHCP servers for use with the IP Phones, see <i>Converging the Data Network with VoIP Fundamentals (NN43001-260)</i> .

- 6 At the prompt, **Cached IP?**, select 0 (0-No, default) to conform to the DHCP standard and to obtain an IP address from the DHCP server. Select 1 (1 for Yes) to force the IP Phone to start with a cached IP address if the IP Phone cannot connect to the DHCP server and obtain an IP address.
- 7 Select Partial or Full DHCP.
- a. If you select Full DHCP, then the following parameters are retrieved from the DHCP server
- a valid IP Phone 1110 IP address
 - a subnet mask
 - the default Gateway for the IP Phone 1110 on the LAN segment to which it connects
 - the S1 IP (the primary CS 1000 node IP address of the IP Phone)
 - the S1 Action
 - the S1 retry count (this is the number of times the IP Phone attempts to connect to the server)
 - the S2 IP (the secondary CS 1000 node IP address of the IP Phone)
 - the S2 Action
 - the S2 retry count
 - the External Application Server (XAS) IP address
- b. If you select Partial DHCP, then you must enter the following parameters.

Screen prompt	Description
S1 IP	The primary CS 1000 node IP address for the IP Phone 1110.
S1 Port	This is a fixed value: 4100.

Screen prompt	Description
S1 action	<p>Choose one of the following:</p> <ul style="list-style-type: none"> • for TPS only, enter 1. • for TPS and Secure Media Controller, enter 6 or 1. <p>For more information about Secure Media Controller, see <i>Secure Multimedia Controller Implementation Guide (NN43001-325)</i>.</p> <p>You are not prompted for S1 PK if S1 Action is set to 1.</p>
S1 retry count	The number of times the IP Phone 1110 attempts to connect to the server. Enter 10.
S1 PK	<p>Default is ffffffff.</p> <p>The Private key of the Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
S2 IP	The secondary CS 1000 node IP address for the IP Phone 1110.
S2 Port	Same as S1.
S2 action	<p>Same as S1.</p> <p>You are not prompted for S2 PK if S2 Action is set to 1.</p>
S2 retry count	Same as S1.

Screen prompt	Description
S2 PK	<p>Default is ffffffff.</p> <p>The Private key of the alternate Secure Media Controller to which the IP Phone connects.</p> <p>If you are using a Secure Media Controller, do the following:</p> <ul style="list-style-type: none"> • Set to 6 or 1. • Enter a 16-digit hexadecimal number.
Cfg XAS? (0-No,1-Yes)	<p>Default 1 (for Yes).</p> <p>If no External Application Server (XAS) is present, enter 0 (for No). You are not prompted to enter the XAS IP address.</p>
XAS IP:	<p>Enter the IP address of the XAS server.</p> <p>The IP Phone 1110 currently does not support an XAS.</p>
Speed (0-A, 1-10, 2-100)	<p>Network interface port speed.</p> <p>Default 0 (for Auto)</p> <p>0 = Auto 1 = 10 BT 2 = 100 BT</p> <p>You are not prompted for Speed if PC Port is set to 0 for Off.</p>
Duplex (0-A, 1-F, 2-H)	<p>Default 1 (for Auto).</p> <p>0 = Auto 1 = Full 2 = Half</p> <p>You are not prompted for Duplex if PC Port is set to 0 for Off or if Speed is set to 0 for Auto.</p>

8 Enter the following parameters

Screen prompt	Description
802.1Q (0-No, 1-Yes)	Default 1 (for Yes). You are not prompted for 802.1Q if LLDP is not enabled.
Voice VLAN (0-N, 1-Y)	Default 0 (for No). You are not prompted for Voice VLAN if 802.1Q is not enabled.
VLAN Cfg? (0-Auto, 1-Man)	Default 0 (for Auto). 0-Auto Automatically obtains VLAN ID using DHCP, or the 802.1ab data switch. 1-Man Enter the VLAN ID manually. This is a number from 1 to 4094. You are not prompted for VLAN Cfg if Voice VLAN is not enabled.
LLDP-MED? (0-N, 1-Y)	Default 0 (for No). If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the Network Policy TLV. You are not prompted for LLDP-MED if VLAN is not set to Auto (2-Auto,) or if LLDP is not enabled.
LLDP VLAN? (0-No, 1-Yes)	Default 0 (for No). If you select 1 (1 for Yes), VLAN ID is configured automatically to the value received in the VLAN NAME TLV. You are not prompted for LLDP VLAN if VLAN is not set to Auto (2-Auto), or if LLDP is not enabled.

Screen prompt	Description
DHCP (0-No, 1-Yes)	Default 0 (for No). If you select 1 (1 for Yes), the VLAN ID is configured automatically to a value received from the DHCP server.
VLANFILTER (0-No, 1-Yes)	You are not prompted for DHCP if VLAN is not set to Auto (2-Au), or if DHCP is not enabled. Default 0 (0 for No). You are not prompted for VLANFILTER if VLAN is not enabled.
Duplex? (0-Auto, 1-Full)	Default 0 (for Auto).
Ctrl pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Ctrl pBits if 802.1Q is not enabled.
Media pBits (0-7, 8-Au)	Default 8 (for Auto). You are not prompted for Media pBits if 802.1Q is not enabled.
PC Port? (0-Off, 1-On)	Default 1 (for On).
Speed (0-A, 1-10, 2-100)	Default 0 (for Auto). 0 = Auto 1 = 10 BT 2 = 100 BT You are not prompted for Speed if PC Port is set to 0 for Off.
Duplex (0-A, 1-F, 2-H)	Default 1 (for Auto). 0 = Auto 1 = Full 2 = Half You are not prompted for Duplex if PC Port is set to 0 for Off and if Speed is set to 0 for Auto.
Data 802.1Q (0-N, 1-Y)	You are not prompted for Data 802.1Q if PC Port is set to 0 for Off.
Data VLAN? (0-N, 1-Y)	Default 0 (for No). You are not prompted for Data VLAN if PC port is set to 0 for Off.

Screen prompt	Description
Data VLAN Cfg? (0-Auto, 1-Man)	Default 1 (for Man). You are not prompted for Data VLAN Cfg if LLDP or Data VLAN are not enabled and PC Port is set to 0 for Off. If you select 0 (for Auto), VLAN ID is automatically configured to the value received in the VLAN NAME TLV.
Data VLAN ID:	You are not prompted for Data VLAN ID if Data VLAN is set to 0 for Auto.
Data pBits (0-7, 8-Au)	Default 8 (for Au). You are not prompted for Data pBits if the PC Port is set to 0 for Off or if 802.1Q is not enabled.
PCUntagAll? (0-N, 1-Y)	Default 0 (for No).
PSK SRTP? (0-No, 1-Yes)	Default 0 (for No).
GARP Ignore? (0-No,1-Yes)	Default 0 (for No).

The IP Phone 1110 supports remote firmware upgrades through a TFTP process and an automated UFTP process.

You are prompted to enter the TFTP Server IP address if you are using a TFTP Server to download the current firmware.

The method to upgrade the firmware depends on the following Call Server software

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 1110 searches for the TFTP Server for firmware upgrade. If the file name specified in 1110.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 1110 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 1110 can support primary (S1) and secondary (S2) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 1110 saves the configuration and then reboots. The IP Phone 1110 searches for the connect server.

- 9 The IP Phone 1110 registers with the TPS and, if needed, begins the firmware download. This takes several minutes. When registration is complete, the IP Phone 1110 resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 10 Check for a dial tone and the correct DN above the display.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing the duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 60 "Enabling Full Duplex mode" \(page 294\)](#) to enable Full Duplex mode.

Procedure 60
Enabling Full Duplex mode

Step	Action
1	Reset the phone by disconnecting and reconnecting power.
2	When the Nortel logo appears, press each soft key in sequence.
3	If no other configuration changes are required, press OK repeatedly until the Duplex network option appears.
4	Select 1 to enable Full Duplex mode.
5	When the Speed option appears, select one of the following <ul style="list-style-type: none"> • 0 for 10 Mb/s • 1 for 100 Mb/s (default)
6	Select OK to confirm the change.
7	Restart the IP Phone 1110. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 61 "Checking Ethernet Statistics" \(page 294\)](#) to confirm activation of Full Duplex mode.

Procedure 61
Checking Ethernet Statistics

Step	Action
1	Double-press the Services key.
2	Press 2 to select Local Diagnostics , then press 3 to open the Ethernet Statistics menu. If Full Duplex mode is active, the following is displayed <ul style="list-style-type: none"> • Link Status: UP • Duplex Mode: Full • Network Speed: 10 Mb or 100 Mb • Auto Sense/Negotiate

- Auto-Negotiate Capability: No
- Auto-Negotiate Completed: No

—End—

TFTP firmware upgrade

When you enter Cfg TFTP = 1 (for yes), and enter an IP address, the IP Phone searches for an upgrade file on the TFTP Server.

Users of CS 1000 Release 4.5, or later do not need to enter a TFTP IP address.

For further information about TFTP firmware upgrade, see [Appendix "TFTP Server" \(page 529\)](#).

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection protects the IP Phone 1110 from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. This allows the malicious device to launch a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 58 "Installing the IP Phone 1110 for the first time using manual configuration" \(page 279\)](#) or [Procedure 59 "Installing an IP Phone 1110 for the first time using DHCP" \(page 286\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Redeploying an IP Phone 1110

You can redeploy an existing previously configured IP Phone 1110 on the same Call Server. For example, the IP Phone 1110 can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 1110. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 62

Changing the TN of an existing IP Phone 1110

Step	Action						
1	<p>Repower the IP Phone 1110.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 1110 displays the existing node number for approximately 5 seconds.</p>						
2	<p>If the node password is enabled and NULL, choose one of the following</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. 						
3	<p>Press OK when the node number displays.</p> <table border="0"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the node password is enabled and is not NULL</td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td>a TN screen displays. Go to Step 5.</td> </tr> </tbody> </table>	If	Then	the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .	the node password is disabled	a TN screen displays. Go to Step 5 .
If	Then						
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .						
the node password is disabled	a TN screen displays. Go to Step 5 .						
4	<p>Enter the password at the password screen and press OK.</p> <p>A TN screen displays.</p> <p>To obtain the password, enter the <code>nodePwdShow</code> command in Element Manager. For further information, see <i>Element Manager System Reference—Administration (NN43001-632)</i>.</p>						
5	Select the Clear soft key to clear the existing TN.						
6	Enter the new TN.						

—End—

Replacing an IP Phone 1110

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 1110 that currently uses the TN.

Procedure 63

Replacing an IP Phone 1110

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 1110 that you want to replace.
3	Follow Procedure 57 "Configuring the IP Phone 1110 " (page 272) to install and configure the IP Phone 1110.
4	Enter the same TN and Node Number as the IP Phone 1110 you replaced. The Call Server associates the new IP Phone 1110 with the existing TN.
—End—	

Removing an IP Phone 1110 from service

Procedure 64

Removing an IP Phone 1110 from service

Step	Action
1	Disconnect the IP Phone 1110 from the network or turn off the power. The service to the PC is disconnected as well if the PC connects to the IP Phone 1110. If the IP Phone 1110 was automatically configured, the DHCP lease expires and the IP address returns to the available pool.
2	In LD 11, enter OUT at the TN prompt.
—End—	

Nortel IP Phone 1120E

Contents

This section contains the following topics:

- "Introduction" (page 299)
- "Description" (page 300)
- "Components and functions" (page 301)
- "Supported features" (page 305)
- "Features not currently supported" (page 307)
- "Display characteristics" (page 307)
- "Local Tools menu password protection" (page 309)
- "Key number assignments" (page 311)
- "Package components" (page 311)
- "Installation and Configuration" (page 313)
- "Full Duplex mode" (page 328)
- "Gratuitous Address Resolution Protocol Protection" (page 330)
- "Extensible Authentication Protocol " (page 331)
- "Redeploying an IP Phone 1120E" (page 331)
- "Replacing an IP Phone 1120E" (page 332)
- "Removing an IP Phone 1120E from service" (page 332)

Introduction

This section explains how to install and maintain the IP Phone 1120E. For information about using the IP Phone 1120E, see the *IP Phone 1120E User Guide (NN43112-103)* or the *IP Phone 1120E Getting Started Card (NN43112-100)*.

This section contains the following procedures

- Procedure 65 "Configuring the IP Phone 1120E" (page 314).

- Procedure 66 "Installing the IP Phone 1120E" (page 319).
- Procedure 67 "Enabling Full Duplex mode" (page 328).
- Procedure 70 "Changing the TN of an existing IP Phone 1120E" (page 331).
- Procedure 71 "Replacing an IP Phone 1120E" (page 332).
- Procedure 72 "Removing an IP Phone 1120E from service" (page 332).

After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Phone 1120E uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 1120E translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 1120E network connection, and Communication Server 1000 connection.

Figure 31 "IP Phone 1120E" (page 300) shows the IP Phone 1120E.

Figure 31
IP Phone 1120E



Nortel Communication Server 1000
IP Phones Fundamentals
NN43001-368 01.01 Standard
Release 5.0 30 May 2007

Components and functions

This section describes the following components of the IP Phone 1120E

- Keys and functions
- Services menu
- Local Tools menu

Keys and functions

Table 40 "IP Phone 1120E keys and functions" (page 301) lists the keys and functions for the IP Phone 1120E.

Table 40
IP Phone 1120E keys and functions

Key	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Visual Alerter/Message waiting indicator	When a message is waiting, the red Visual Alerter/Message waiting indicator lights. Also, when the ringer sounds, this indicator flashes.
Feature Status Lamp indicator	When the firmware is updating, the blue Feature Status Lamp indicator flashes. This function requires server support and, therefore, is not available on all phones.
Self-labeled line/programmable feature keys	Self-labeled line/programmable feature key labels are configured for various features on the IP Phones. A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.
Context-sensitive soft keys	Context-sensitive soft keys are located below the display area. The LCD label above the key changes, based on the active feature. A triangle before a key label indicates that the key is active.
Fixed feature keys	Use these keys to access non-programmable standard features.
Expand	The Expand key is used to access an External Application Server such as, Nortel Application Server.

Key	Function
Navigation keys	<p>Use the Navigation keys to scroll through menus and lists that appear on the LCD display screen. The outer part of this key cluster rocks for up, down, left, and right movements.</p> <p>Use Up and Down keys to scroll up and down in lists, and the Left and Right keys to position the cursor. You can also use the Left and Right keys to select editable fields that appear on the phone. Press the Right key to select the field below the current position, or press the Left key to select the field above the current position.</p>
Enter	Press the Enter key, at the center of the Navigation key cluster, to confirm menu selections. In many cases, you can use the Enter key instead of the Select soft key.
Message/Inbox	Press the Message/Inbox key to access your voice mailbox.
Shift/Outbox	The Shift/Outbox key is a fixed key that is reserved for future feature development.
Quit/Stop	<p>Press the Quit/Stop key to end an active application.</p> <p>Pressing the Quit/Stop key does not affect the status of the calls currently on your IP Phone.</p>
Directory	Press the Directory key to access Directory services.
Mute	<p>Press the Mute key to listen to the receiving party without transmitting.</p> <p>Press the Mute key again to return to a two-way conversation.</p> <p>The Mute key applies to Handsfree, Handset, and Headset microphones.</p> <p>The Mute LED flashes when the Mute option is in use.</p>
Headset	<p>Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.</p> <p>The Headset LED flashes when the Headset option is in use.</p>
Volume control keys	<p>Press the volume control keys to adjust the volume of the handset, headset, speaker, ringer, and, Handsfree feature.</p> <p>Press the volume key with the loudspeaker icon to increase volume; press the volume key without the loudspeaker icon to decrease volume.</p>

Key	Function
Copy	Press the Copy Key to copy entries to your Personal Directory from other lists, such as the Caller List, Redial List and Corporate Directory.
Speaker	Press the Handsfree key to activate the speaker.
Handsfree	Press the Handsfree key to activate the Handsfree feature.
	The LED lights to indicate when handsfree is active.

Services menu

Table 41 "Services menu" (page 303) shows the Services menu.

Table 41
Services menu

Services	<p>Press the Services key to access the following items</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language — Date/Time — Display diagnostics — Local Dialpad Tone — Set Info — Diagnostics — Call Log Options — Ring type — Call Timer — OnHook Default Path — Change Feature Key Label — Name Display Format — Live Dialpad • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured)
----------	---

- Password Admin

If a call is presented while the user is manipulating an option, the IP Phone 1120E rings and the DN key flashes. However, the display is not updated with the Caller ID, and the programming text is not disturbed.

The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID, and Autodial and Last Number Redial intercept the dialpad.

Local Tools menu

Table 42 "Local Tools menu" (page 304) shows the Local Tools menu.

Table 42

Local Tools menu

Press the Services key twice to access the Local Tools menu. The following items appear in the Local Tools menu

1. Preferences
 - a. Display Settings
 - b. Languages
2. Local Diagnostics
 - a. IP Set&DHCP Information
 - b. Network Diagnostic Tools
 - c. Ethernet Statistics
 - d. IP Network Statistics
 - e. USB Devices
3. Network Configuration
4. Lock Menu
 - a. Manual Secure Local Menu
 - b. Manual Partial Secure Menu
 - c. Manual Disable Secure Menu
 - d. DHCP Secure Menu
 - e. Lock Now

To make a selection, press the number associated with the menu item, or use the navigation keys to scroll through the menu items. Press the Enter key to select the highlighted menu item.

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see "[Local Tools menu password protection](#)" (page 309).

Press the Quit/Stop key to exit from any menu or menu item.

For information about configuring IP Phone 1120E Local Tools menu, see [Appendix "Configuring the Local Tools menu"](#) (page 455).

Supported features

The IP Phone 1120E supports the following telephony features

- four self-labeled line/programmable feature keys with labels and indicators
- four context-sensitive soft keys that provide access to a maximum of nine features

Functions for the context-sensitive soft keys are configured in LD 11.

- high quality speaker phone
- volume control keys to adjust ringer, speaker, handset, and headset volume
- six specialized feature keys
 - Quit
 - Directory
 - Message/Inbox
 - Shift/Outbox
 - Services
 - Copy
- six call-processing fixed keys
 - Mute
 - Handsfree
 - Goodbye
 - Expand
 - Headset
 - Hold
- Call Duration Timer
- ability to change the self-labeled line/programmable feature key labels
- Corporate Directory
- Personal Directory

- Redial List
- Callers List
- Password Administration
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 1120E supports the following data network features

- integrated Gigabit Ethernet switch for shared PC access
 - the LAN Ethernet port supports 10/100/1000 Mb/s Full Duplex mode
 - the PC Ethernet port supports 10/100/1000 Mb/s Full Duplex mode
- automatic network configuration through DHCP
For more information about automatic network configuration, see [Table 44 "IP Phone 1120E IP parameters" \(page 319\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP)
For more information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption
For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).
- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone; allows VLAN and priority tagging for the IP Phone traffic and VLAN tagging for PC traffic
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.
- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN

For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 3
- Gratuitous Address Resolution Protocol (GARP) Protection

The IP Phone 1120E supports the following user interface features

- graphical, high-resolution LCD display, backlit, with adjustable contrast
- USB port, to support USB devices

Powered downstream 1.1 compliant USB hubs are supported, including USB 2.0 hubs, if they offer USB 1.1 backwards compliancy.

- Hearing Aid Compatibility (HAC) as per FCC Part 68
- External Application Server (XAS)
- Graphical External Application Server (GXAS)
- headset jack with On/Off key
- language support: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana

With the appropriate downloaded fonts, the IP Phone supports Arabic, Chinese Simplified, Chinese Traditional, Hebrew, Japanese, and Korean.

For more information about language support, see [Appendix "Language enhancement" \(page 527\)](#).

- Expansion Module for IP Phone 1100 Series (Expansion Module)

For more information about the Expansion Module, see ["Expansion Module for IP Phone 1100 Series" \(page 413\)](#).

Features not currently supported

The following features are not supported on the IP Phone 1120E

- Group Listening
- Set-to-Set messaging

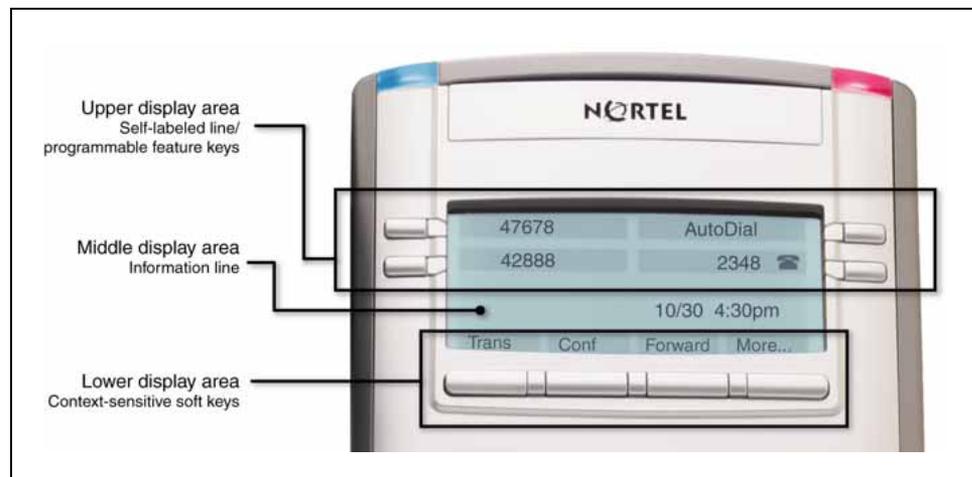
Display characteristics

An IP Phone 1120E has three major display areas

- self-labeled line/programmable feature key label
- information line
- soft key label

Figure 32 "1120E IP display area" (page 308) shows these three display areas.

Figure 32
1120E IP display area



Self-labeled line/programmable feature key label display

The feature key label area displays a 10-character string for each of the four feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. A telephone icon displays the status of the configured DN. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen. To change the feature key label, press the Services key to access Telephone Options > Change Feature key label option. For more information about changing the feature key label, see the *IP Phone 1120E User Guide (NN43112-103)*.

If a label is longer than 10 characters, the last 10 characters are displayed and the excess characters are deleted from the beginning of the string.

Information line display

An IP Phone 1120E has a one-line information display area with the following information

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state) or Call Timer (if provisioned in the Telephone options menu)

The information in the display area changes, according to the call-processing state and active features.

Because the IP Phone 1120E only has a one-line information display area, you are prompted to scroll through any additional lines of information.

During an incoming call, only the Directory Number (DN) displays if the caller name is greater than 10 characters. Press the flashing arrow to display the caller name.

Context-sensitive soft key label display

The context-sensitive soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Use the More soft key to navigate through the layers of functions. If only four functions are assigned to the soft keys, the More key does not appear, and all four functions are displayed.

Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Local Tools menu password protection

If the SECUREMENU parameter was set during Full DHCP configuration, the Local Tools menu is locked to prevent accidental or unwanted changes. You are prompted to enter the fixed password 26567*738 (color*set) whenever the Services key is double-pressed, or whenever the Local Diagnostics and Network Configuration sub menus are accessed.

If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access 2. Local Diagnostics, or 3. Network Configuration menu items from the Local Tools menu. You are always prompted to enter the fixed password whenever you access the 4. Lock Menu sub menu.

Two ways to control the menu lock are as follows

- DHCP Secure Menu option—the IP Phone processes the secure menu setting retrieved from the Full DHCP response.

- Lock Menu option—double-press the Services key to access the Local Tools menu. Press **4** on the dialpad to access the Lock Menu items, or use the up/down navigation keys to scroll and highlight one of the following Lock Menu options
 - 1. Manual Secure Local Menu
 - 2. Manual Partial Secure Menu
 - 3. Manual Disable Secure Menu
 - 4. DHCP Secure Menu
 - 5. Lock Now

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

For more information about 4. Lock Menu manual user settings, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Configuring Secure Local Menu through Full DHCP

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECURE parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECURE parameter is present, password protection is not enabled.

The SECUREMENU/PARTSECURE item is an optional parameter. If it is present, then the full S4 string needs to be present, including the action and retries. The S4 string is already present if the XAS support has been configured through the DHCP. If XAS is not configured, you can still enable password protection by setting the S4 IP address to 0.0.0.0 and by setting the other fields to 0.

ATTENTION

With Full DHCP, the vendor-specific or site-specific options must be configured depending on the customers DHCP server configuration.

For further information about configuring Full DHCP, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Accessing the Local Tools menu

After you enter the password, the Local Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Local Tools menu without being prompted to reenter the password. To reset the timer before the 5-minute time expires, double-press the Services key.

You can also press the 5 key to select the Lock Now item from the Lock Menu. The Lock Now item immediately exits the Local Tools menu, closes any open Local Tools menu pages, and locks the Local Tools menu. Alternatively, when time expires, the Local Tools menu and any open submenus are closed. Double-press the Services key to open the password prompt window to reaccess the Local Tools menu.

If you enter an incorrect password, the Local Tools menu does not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5-minute time expires.

Some text appears dimmed depending on the current state of the menu lock and the configuration of the IP Phone. Only configuration options that are enabled from the current state appear active. Menu options that are not available appear dimmed.

For more information about configuring the Local Tools menu for the IP Phone 1120E, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined soft keys. Because the soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four soft keys. Labels for the soft keys appear in the display area. For further information, see ["Context-sensitive soft key label display" \(page 309\)](#). [Figure 32 "1120E IP display area" \(page 308\)](#) shows the IP Phone 1120E display area.

Key number mappings at the Call Server align with the IP Phone 2002.

For a description of the IP Phone function assignment for each soft key, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The IP Phone 1120E includes integrated support for a number of Power over Ethernet options, including support for IEEE 802.3af Power Classification 3.

Table 43 "IP Phone 1120E components list" (page 312) lists the IP Phone 1120E package components and product codes.

Table 43
IP Phone 1120E components list

IP Phone 1120E package contents include		
<ul style="list-style-type: none"> • IP Phone 1120E • handset • handset cord • 2.1 m (7-ft.) CAT5 Ethernet cable • Number plate and lens • Getting Started Card 		
IP Phone 1120E with icon key caps (Graphite)	NTYS03AC	
IP Phone 1120E with English key caps (Graphite)	NTYS03BC	
IP Phone 1120E with icon key caps (Graphite) RoHS	NTYS03ACE6	
IP Phone 1120E with English key caps (Graphite) RoHS	NTYS03BCE6	
Replacement parts		
Handset, Charcoal	NTYS09AA70	
Handset cord, Charcoal	NTYS10AA70	
Footstand kit, Charcoal	NTYS11AA70	
Phone number label and lens kit	NTYS12AA	
2.1 m (7-ft) CAT5 Ethernet cable	NTYS13AA	
Power adapter		
Global power supply (for local power)	N0089601	
IEC cables	RoHS	Non-RoHS
1.8 m (5.9 ft), 10 amp, IEC320-C13 North America	NTYS14AAE6	NTYS14AA
2.4 m (8 ft), 240 VAC 10 amp, ANZ power cord AS-3, Australia, New Zealand	N/A	NTTK15AA
250 VAC, Option 11C Standard European power cord, Other EMEA, Kenya, Korea, Thailand, Indonesia, Vietnam, India, Pakistan	NTTK16ABE6	NTTK16AB
3 m (9.9 ft) 125 VAC, Option 11C Swiss power cord Switzerland	NTTK17ABE6	NTTK17AB
240 VAC, Option 11C UK power cord Hong Kong, Ireland, United Kingdom, Singapore, Malaysia, Bangladesh, Brunei, Sri Lanka	NTTK18ABE6	NTTK18AB

3 m (9.9 ft), 125 VAC, Option 11C Denmark power cord Denmark	NTTK22ABE6	NTTK22AB
Argentina	N/A	A0814961
1.8 m (5.9 ft), 10 amp, IEC320-C13 Japan	NTTK26AAE6	N/A

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 1120E

- Before you begin
- First-time installation
- Configuring the IP Phone 1120E
- Startup sequence
- Installing the IP Phone 1120E

Before you begin

Before installing the IP Phone 1120E, complete the following pre-installation checklist

- Ensure one IP Phone 1120E boxed package exists for each IP Phone 1120E being installed. The package contains
 - IP Phone 1120E
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - Number plate and lens
 - Getting Started Card
- Ensure 1 Software License exists for each IP Phone 1120E being installed.
- Ensure the host Call Server is equipped with the a voice Gateway Media Card and a Signaling Server with the Line TPS application.
- If an AC power adapter is required, ensure the approved Nortel global power supply (model number N0089601) is used. See [Table 43 "IP Phone 1120E components list" \(page 312\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Do not plug your IP Phone 1120E into an ISDN connection. Severe damage can result. The IP Phone 1120E does not support multiple devices connected through the PC Ethernet port.

Configuring the IP Phone 1120E

You must configure the IP Phone 1120E before you can use it. Use [Procedure 65 "Configuring the IP Phone 1120E" \(page 314\)](#) to configure the IP Phone 1120E for the first time.

Procedure 65

Configuring the IP Phone 1120E

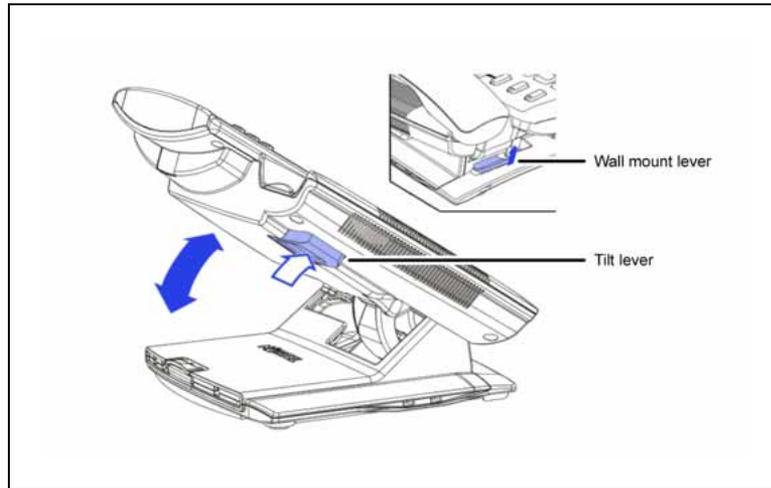
Step	Action
1	Configure a virtual loop on the Call Server using LD 97. For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> , and <i>Software Input Output Administration (NN43001-611)</i> .
2	Configure the IP Phone 1120E on the Call Server using LD 11. At the prompt, enter the following <code>REQ: chg</code> <code>TYPE: 1120</code> For more information about configuring the IP Phone 1120E using LD 11, see <i>Software Input Output Administration (NN43001-611)</i> .



CAUTION

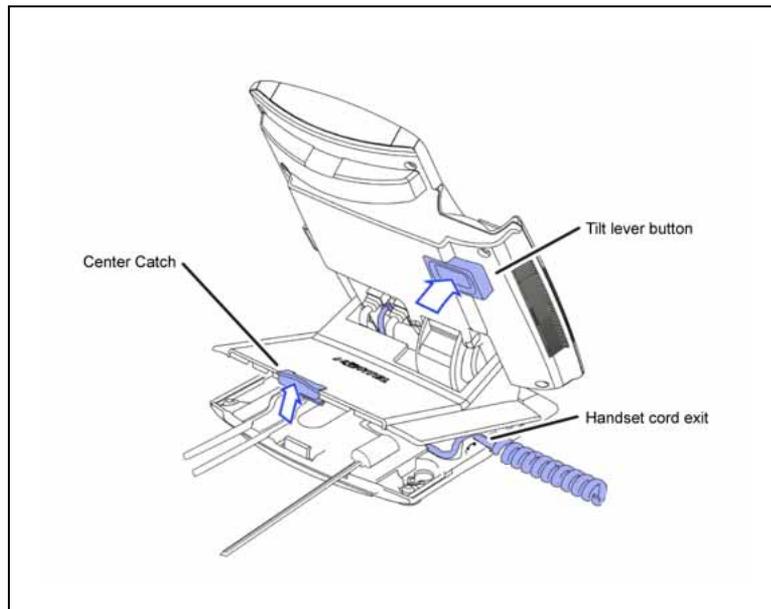
The IP Phone 1120E is shipped with the stand locked in position. To avoid damaging the IP Phone, press the wall-mount lever located under the Handsfree key to release the stand and pull it away from the phone. See [Figure 33 "Release the IP Phone 1120E from the stand" \(page 315\)](#)

Figure 33
Release the IP Phone 1120E from the stand



- 3 Remove the stand cover. Pull upward on the center catch and remove the stand cover. The cable routing tracks are now accessible. See [Figure 34 "Stand cover removed"](#) (page 315).

Figure 34
Stand cover removed



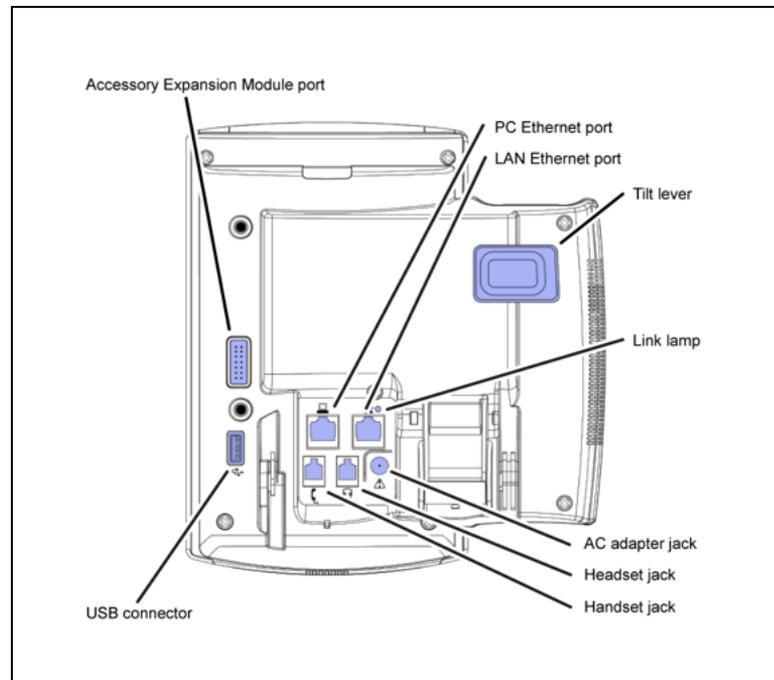
- 4 Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable, and then thread the adapter cord through the channels in the stand.

**WARNING**

Use your IP Phone 1120E with the approved Nortel global power supply (model number N0089601).

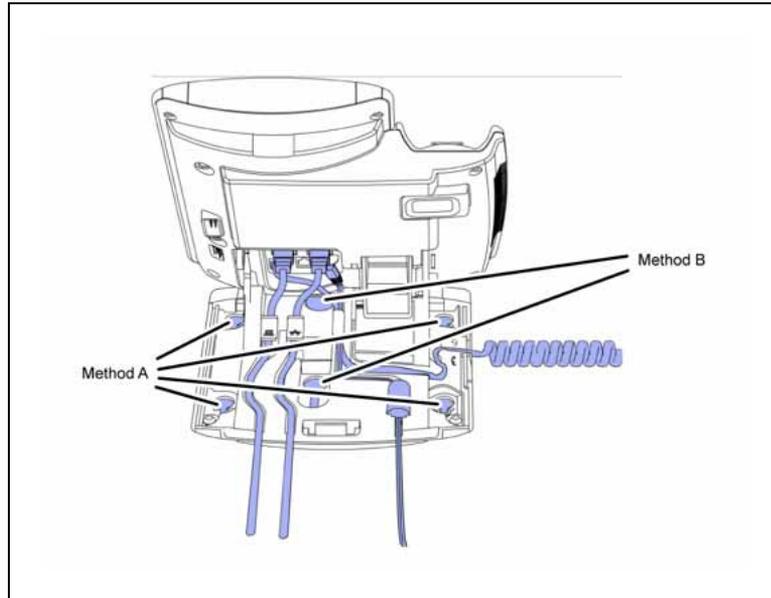
The IP Phone 1120E supports both AC power and Power over LAN options, including IEEE 802.3af Power Classification 3. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately. You must use CAT5e (or later) cables if you want to use Gigabit Ethernet.

Figure 35
IP Phone 1120E connections



- 5 Install the handset. Connect the end of the handset cable with the short straight section into the handset. Connect the end of the handset cable with the long straight section to the back of the phone, using the RJ-9 handset jack. Form a small bend in the cable, and then thread the handset cord through the channels in the stand so that it exits behind the handset on the right side, in the channel exit in the stand base. See [Figure 36 "Cable routing tracks" \(page 317\)](#).

Figure 36
Cable routing tracks



- 6 Install the Ethernet cable. Connect one end of the supplied Ethernet cable to the back of your phone using the CAT5 connector (LAN Ethernet port), and thread the network cable through the channel (LAN Ethernet port).
- 7 If you are connecting your PC through the phone, a second CAT5 cable is required. Only one cable is included with the IP Phone 1120E package. Install the Ethernet cable connecting the PC to the phone (optional). Connect one end of the PC Ethernet cable to your phone using the CAT5 connector (PC Ethernet port), and thread it through the channel. Connect the other end to the LAN connector on the back of your PC.



CAUTION

Damage to Equipment

Do not plug any device into your IP Phone 1120E PC Ethernet port other than a PC.

- 8 Connect additional cables. If applicable, plug in optional USB devices. Connect the Ethernet cable to the LAN Ethernet connection. If you are using an AC power adapter, plug the adapter into an AC outlet.

Complete steps 1 to 9, as needed, before wall-mounting the IP Phone.

- 9** Wall-mount your phone (optional). Use Method A or Method B to wall-mount the IP Phone. See Method A—using the mounting holes on the bottom of the phone stand, or Method B—using the traditional-style wall-mount box with a CAT5 connector and a 15 cm (6 inch) CAT5 cord (not provided).
- Method A: Press the wall-mount lever, and pull away from the stand. Using the stand cover (see [step 3](#)), mark the wall-mount holes by pressing the bottom of the stand cover firmly against the wall in the location where you wish to install the phone. Four small pins on the bottom of the stand cover make the marks on the wall. Use the marks as a guideline to install the wall-mount screws (not provided).

Install the screws so that they protrude 3 mm (1/8 inch) from the wall, and then install the phone stand mounting holes over the screw heads. You may need to remove the phone from the wall to adjust the lower screws. When the lower screws are snug, install the phone on the mounting screws, and then tighten the top screws.
 - Method B: Attach the 15 cm (6 inch) CAT5 cable, position the stand over the mounting rivets, and slide the phone down the wall so that the rivets fit into the slots on the stand.
- 10** Replace the stand cover. Ensure that all cables are neatly routed and press the stand cover into place until you hear a click.
- 11** If you wall-mount the phone, put it in the wall-mount position by holding the tilt lever and press the phone towards the base until the phone is parallel with the base. Release the tilt lever and continue to push the phone towards the base until you hear a click. Ensure the phone is securely locked in to position.

—End—

Startup sequence

When an IP Phone 1120E connects to the network, it must perform a startup sequence. The elements of the startup sequence include

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 44 "IP Phone 1120E IP parameters" \(page 319\)](#) for a summary of the IP parameters and how they are obtained.

Table 44
IP Phone 1120E IP parameters

Parameter	Method of acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically obtained through Partial or Full DHCP.
Net Mask	Manually entered or automatically obtained through Partial or Full DHCP.
Default Gateway Address	Manually entered or automatically obtained through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically obtained through Full DHCP.
User ID (No de ID, Node Password and TN)	Manually entered for first-time configuration. Obtained from local storage on subsequent power cycles.

Installing the IP Phone 1120E

To install the IP Phone 1120E, use [Procedure 66 "Installing the IP Phone 1120E" \(page 319\)](#).

ATTENTION

Timing information

There are approximately 45 seconds between plugging in the IP Phone 1120E power adapter and the appearance of the text Nortel. When you see the text Nortel on the phone, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 1120E attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the Local diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 309\)](#).

Procedure 66

Installing the IP Phone 1120E

Step	Action
1	When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in

sequence from left to right. The **3. Network Configuration** menu opens.

You can press the **Apply&Reset** soft key to save the following settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the **3. Network Configuration** menu.

When the **3. Network Configuration** menu opens, the **Enable 802.1x (EAP)** check box is highlighted.

- 2 Press the **Enter** key to switch this item on and off. A check mark appears to indicate the item is active.

If 802.1x Authentication is enabled, press the **Enter** key to start the edit mode. Use the keypad to fill in the following information

- Device ID
- Password
- Retype password

For further information about EAP, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

If you do not enable 802.1x Authentication, you are not prompted to enter Device ID and Password.

- 3 Use the **Right** navigation key to scroll and highlight **Enable 802.1x (LLDP Enable)** check box. Press the **Enter** key to switch this item on and off.

For information about LLDP, see [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).

- 4 Use the **Right** navigation key to scroll and highlight **DHCP** list.

- 5 Press the **Enter** key.

- 6 Press the **Down** navigation key to open list box.

- 7 Use the **Up/Down** navigation keys to scroll and highlight one of the following DHCP options

- No—disable DHCP support and enter IP network information manually.
- Partial—IP network information (IP address, network mask, and gateway address) are provided by the DHCP server. Enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers manually.

- Full—IP network information, Server 1 IP address, Server 2 IP address, and XAS information are provided by the DHCP server. All items are dimmed to prevent manual entry.

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.

For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 8 Press the **Enter** key.
- 9 Use the **Right** navigation key to scroll and highlight **SET IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Set IP—a valid IP Phone 1120E IP address
- 10 Use the **Right** navigation key to scroll and highlight **NET MASK**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Net Mask—a subnet mask
- 11 Use the **Right** navigation key to scroll and highlight **Gateway**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Gateway—the default gateway for the IP Phone 1120E on the LAN segment to which it connects
- 12 Use the **Right** navigation key to scroll and highlight **S1 IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
S1 IP—the primary CS 1000 node IP address for the IP Phone 1120E
- 13 Use the **Right** navigation key to scroll and highlight **Port**.
S1 Port—a fixed value of 4100
- 14 Use the **Right** navigation key to scroll and highlight **S1 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following
 - for TPS only, enter 1
 - for TPS and Secure Media Controller, enter 6 or 1

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

- 15** Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- Retry—the number of times the IP Phone 1120E attempts to connect to the server
- 16** Use the **Right** navigation key to scroll and highlight **S1 PK**.
- S1 PK—the Private key of the Secure Media Controller to which the IP Phone connects
- 17** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Enter 6 or 1.
- For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.
- 18** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffff.
- 19** Use the **Right** navigation key to scroll and highlight **S2 IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- S2 IP—the secondary CS 1000 node IP address for the IP Phone 1120E
- The IP Phone 1120E can support a primary (S1) and secondary (S1) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.
- 20** Use the **Right** navigation key to scroll and highlight **Port**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- Port—same as S1 port
- 21** Use the **Right** navigation key to scroll and highlight **S2 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following
- for TPS only, enter 1
 - for TPS and Secure Media Controller, enter 6 or 1

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

- 22 Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- Retry—same as S1
- 23 Use the **Right** navigation key to scroll and highlight **S2 PK**.
- S2 PK—the Private key of the alternate Secure Media Controller to which the IP Phone connects
- 24 Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Set the S2 PK to 6 or 1.
- 25 Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffffffffffff.
- 26 Use the **Right** navigation key to scroll and highlight **Ntwk Port Speed** box. Press the **Down** navigation key to open the list box. Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Link speed is autonegotiated with the network device
 - 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the network
 - 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the network
- 27 Use the **Right** navigation key to scroll and highlight **Ntwk Port Duplex** box. Press the **Down** navigation key to open the list box. The **Ntwk Port Duplex** option appears dimmed if **Ntwk Port Speed** is set to Auto. Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Duplex mode is autonegotiated with the network device
 - Force Full—Duplex mode is forced to Full Duplex on the network
 - Force Half—Duplex mode is forced to Half Duplex on the network
- 28 Use the **Right** navigation key to scroll and highlight **Disable Voice 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 29 Use the **Right** navigation key to scroll and highlight **VoiceVLAN** box. Press the **Down** navigation key to open the list box.

- 30 Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- No VLAN
 - DHCP—VLAN ID is configured automatically to one of the values received from the DHCP server
 - LLDP MED—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - Manual

If LLDP is disabled, LLDP MED and LLDP VLAN Name modes do not appear in the list. If DHCP is disabled, DHCP does not appear in the list.

- 31 Use the **Right** navigation key to scroll and highlight **VLAN Filter** check box.

VLAN Filter appears dimmed if **Disable Voice 802.1Q** check box is selected.

If the VLAN Filter is enabled, packets destined for the IP Phone port are filtered on their MAC address and their VLAN tag. Untagged VLAN packets and tagged VLAN packets that differ from the Telephony VLAN ID are prevented from reaching the IP Phone port.

For information about VLAN tagging, [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 32 Use the **Right** navigation key to scroll and highlight **Ctrl Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.

Ctrl Priority Bits option appears dimmed if **Disable Voice 802.1Q** check box is selected.

- 33 Use the **Right** navigation key to scroll and highlight **Media Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.

Media Priority Bits option appears dimmed if **Disable Voice 802.1Q** check box is selected.

- 34 Use the **Right** navigation key to scroll and highlight **Disable PC Port** check box. Press the **Enter** key to switch this item on and off.

- 35 Use the **Right** navigation key to scroll and highlight **PC Port Speed** box. Press the **Down** navigation key to open the list box.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options

- Auto—Link speed is autonegotiated with the attached PC
- 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the PC port.
- 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the PC port.

36 Use the **Right** navigation key to scroll and highlight **PC Port Duplex** box. Press the **Down** navigation key to open the list box. Use the **Up/Down** navigation keys to scroll and highlight one of the following options

- Auto—Duplex mode is autonegotiated with the attached PC
- Force Full—Duplex mode is forced to Full Duplex on the PC
- Force Half—Duplex mode is forced to Half Duplex on the PC

PC Port Duplex appears dimmed if the **PC Port Speed** option is set to Auto.

37 Use the **Right** navigation key to scroll and highlight **Disable Data 802.1Q** check box. Press the **Enter** key to switch this item on and off.

38 Use the **Right** navigation key to scroll and highlight **DataVLAN** box. Press the **Down** navigation key to open the list box.

The **DataVLAN** option appears dimmed if **Disable Data 802.1Q** check box is selected.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options

- No VLAN
- LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
- VLAN ID value—manual selection of VLAN ID from 1 to 4094

If LLDP is disabled, LLDP VLAN Name does not appear in the list.

39 Press the **Enter** key.

40 Use the **Right** navigation key to scroll and highlight **Data Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.

41 Use the **Right** navigation key to scroll and highlight **PC-Port Untag All** check box. Press the **Enter** key to switch this item on and off.

The **PC-Port Untag All** option appears dimmed if **Disable Data 802.1Q** check box is selected.

- 42 Use the **Right** navigation key to scroll and highlight **Cached IP** check box. Press the **Enter** key to switch this item on and off.
- 43 Use the **Right** navigation key to scroll to **Enable PSK SRTP**. Press the **Enter** key to switch this item on and off.

The SRTP media encryption feature provides encrypted media. A preshared secret is embedded in the Nortel IP Phone to generate and to exchange encryption parameters without any Call Server involvement.

For further information about the SRTP media encryption feature, see "[SRTP media encryption](#)" (page 429) and *Security Management Fundamentals (NN43001-604)*.

- 44 Use the **Right** navigation key to scroll and highlight **Ignore GARP** check box. Press the **Enter** key to switch this item on and off.

The GARP feature protects the IP Phone from a Gratuitous ARP Spoof attack from the network.

For more information about GARP, see "[Gratuitous Address Resolution Protocol Protection](#)" (page 330).

- 45 If an External Application Server (XAS) is available in the network, use the **Right** navigation key to scroll and highlight the **XAS IP** list. Use the dialpad to enter the XAS IP address.

The XAS delivers business applications to the IP Phone. For more information about XAS, see Nortel Application Gateway 1000 documentation.

- 46 If the XAS supports graphical displays, use the **Right** navigation key to scroll and highlight **Graphical XAS** check box. Press the **Enter** key to switch this item on and off.

- 47 Use the **Right** navigation key to scroll and highlight **Port** list. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.

- 48 Upgrade the IP Phone 1120E firmware.

The IP Phone 1120E supports remote firmware upgrades through a TFTP process and an automated UFTP process.

The method to upgrade the firmware depends on the following Call Server software

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt.
- For CS 1000 Release 4.5 or later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 1120E searches for the TFTP Server for firmware upgrade. If the file name specified in 1120e.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 1120E reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

- 49** The IP Phone 1120E searches for the connect server.
- The IP Phone 1120E registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 1120E resets.
- The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.
- 50** Check for a dial tone and the correct DN on the display.
- 51** (Optional) Customize the feature keys as required. For more information, see *IP Line Fundamentals (NN43100-500)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 67 "Enabling Full Duplex mode" \(page 328\)](#) to enable Full Duplex mode.

Procedure 67 Enabling Full Duplex mode

Step	Action
1	Double-press the Services key to open the Local Tools menu.
2	Press 3 on the dialpad to access the Network Configuration menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
3	Use the Right navigation key to scroll and highlight the Duplex list.
4	Press Enter to start the edit mode.
5	Press the Down navigation key to open list box.
6	Use the Up/Down navigation keys to scroll and highlight one of the following options <ul style="list-style-type: none"> • 10BT Full—10 BT Full Duplex mode • 100BT Full—100 BT Full Duplex mode
7	Press Enter to exit the edit mode.

- 8 Press the **Apply&Reset** soft key to save the changes and to restart the IP Phone 1120E. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Procedure 68

Disabling Auto Negotiate and enabling Full Duplex mode

Step	Action
------	--------

- | | |
|---|---|
| 1 | Double-press the Services key to open the Local Tools menu. |
| 2 | Press 3 on the dialpad to access the Network Configuration menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option. |
| 3 | Use the Right navigation key to scroll and highlight the Duplex box. |
| 4 | Press Enter to start the edit mode. |
| 5 | Press the Down navigation key to open list box. |
| 6 | Use the Up/Down navigation keys to scroll and highlight one of the following options <ul style="list-style-type: none"> • 10BT Full—10 BT Full Duplex mode • 100BT Full—100 BT Full Duplex mode |
| 7 | Press Enter to exit the edit mode. |
| 8 | Press the Apply&Reset soft key to save the changes and to restart the IP Phone 1120E. |

—End—

When the IP Phone 1120E restarts, the firmware reads the setting for Full Duplex mode and sets both port 0, network interface port, and port 1, PC interface port, accordingly.

Use [Procedure 69 "Checking Ethernet Statistics" \(page 330\)](#) to confirm activation of Full Duplex mode.

Procedure 69
Checking Ethernet Statistics

Step Action

- 1 Double-press the **Services** key.
- 2 Press **2** to select **Local Diagnostics**, then press **3** to open the **Ethernet Statistics** menu.

If Full Duplex mode is active, the following is displayed

- Link Status: UP
- Duplex Mode: Full
- Network Speed: 10 MB, 100 MB, or 1 G
- Auto Sense/Negotiate
 - Auto-Negotiate Capability: No
 - Auto-Negotiate Completed: No

—End—

TFTP firmware upgrade

When you enter Cfg TFTP = 1 (for yes), and enter an IP address, the IP Phone searches for an upgrade file on the TFTP Server.

Users of CS 1000 Release 4.5, or later do not need to enter a TFTP IP address.

For further information about TFTP firmware upgrade, see [Appendix "TFTP Server" \(page 529\)](#).

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection protects the IP Phone 1120E from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. This allows the malicious device to launch a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 66 "Installing the IP Phone 1120E" \(page 319\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Redeploying an IP Phone 1120E

You can redeploy an existing previously configured IP Phone 1120E on the same Call Server. For example, the IP Phone 1120E can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 1120E. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 70

Changing the TN of an existing IP Phone 1120E

Step	Action						
1	<p>Repower the IP Phone 1120E.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 1120E displays the existing node number for approximately 5 seconds.</p>						
2	<p>If the node password is enabled and NULL, choose one of the following</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. 						
3	<p>Press OK when the node number displays.</p> <table border="0" style="width: 100%;"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the node password is enabled and is not NULL</td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td>a TN screen displays. Go to Step 5.</td> </tr> </tbody> </table>	If	Then	the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .	the node password is disabled	a TN screen displays. Go to Step 5 .
If	Then						
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .						
the node password is disabled	a TN screen displays. Go to Step 5 .						
4	<p>Enter the password at the password screen and press OK.</p> <p>A TN screen displays.</p> <p>To obtain the password, enter the nodePwdShow command in Element Manager. For further information, see <i>Element Manager System Reference—Administration (NN43001-632)</i>.</p>						

- 5 Select the **Clear** soft key to clear the existing TN.
- 6 Enter the new TN.

—End—

Replacing an IP Phone 1120E

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 1120E that currently uses the TN.

Procedure 71

Replacing an IP Phone 1120E

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 1120E that you want to replace.
3	Follow Procedure 65 "Configuring the IP Phone 1120E" (page 314) to install and configure the IP Phone 1120E.
4	Enter the same TN and Node Number as the IP Phone 1120E you replaced. The Call Server associates the new IP Phone 1120E with the existing TN.

—End—

Removing an IP Phone 1120E from service

Procedure 72

Removing an IP Phone 1120E from service

Step	Action
1	Disconnect the IP Phone 1120E from the network or turn off the power.

- 2 In LD 11, enter OUT at the TN prompt.

—End—

Nortel IP Phone 1140E

Contents

This section contains the following topics:

- "Introduction" (page 336)
- "Description" (page 336)
- "Components and functions" (page 337)
- "Supported features" (page 341)
- "Features not currently supported" (page 344)
- "Display characteristics" (page 344)
- "Cleaning the IP Phone display screen" (page 346)
- "Local Tools menu password protection" (page 346)
- "Key number assignments" (page 348)
- "Package components" (page 348)
- "Installation and Configuration" (page 350)
- "Full Duplex mode" (page 365)
- "TFTP firmware upgrade " (page 367)
- "Gratuitous Address Resolution Protocol Protection" (page 367)
- "Extensible Authentication Protocol " (page 367)
- "Bluetooth wireless technology" (page 368)
- "Redeploying an IP Phone 1140E" (page 368)
- "Replacing an IP Phone 1140E" (page 369)
- "Removing an IP Phone 1140E from service" (page 369)

Introduction

This section explains how to install and maintain the IP Phone 1140E. For information about using the IP Phone 1140E, see the *IP Phone 1140E User Guide (NN43113-106)* or the *IP Phone 1140E Getting Started Card (NN43113-103)*.

This section contains the following procedures

- [Procedure 73 "Configuring the IP Phone 1140E" \(page 351\)](#).
- [Procedure 74 "Installing the IP Phone 1140E" \(page 357\)](#).
- [Procedure 75 "Enabling Full Duplex mode" \(page 366\)](#).
- [Procedure 76 "Checking Ethernet Statistics" \(page 366\)](#).
- [Procedure 77 "Changing the TN of an existing IP Phone 1140E" \(page 368\)](#).
- [Procedure 78 "Replacing an IP Phone 1140E" \(page 369\)](#).
- [Procedure 79 "Removing an IP Phone 1140E from service" \(page 369\)](#).

After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

Description

The IP Phone 1140E uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 1140E translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 1140E network connection, and Communication Server 1000 connection.

[Figure 37 "IP Phone 1140E" \(page 337\)](#) shows the IP Phone 1140E.

Figure 37
IP Phone 1140E



Components and functions

This section describes the following components of the IP Phone 1140E

- Keys and functions
- Services menu
- Local Tools menu

Keys and functions

Table 45 "IP Phone 1140E keys and functions" (page 337) lists keys and functions for the IP Phone 1140E.

Table 45
IP Phone 1140E keys and functions

Key	Function
Hold	Press the Hold key to put an active call on hold. Press the line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Visual Alerter/Message waiting indicator	When a message is waiting, the red Visual Alerter/Message waiting indicator lights. Also, when the ringer sounds, this indicator flashes.

Key	Function
Feature Status Lamp indicator	<p>When the firmware is updating, the blue Feature Status Lamp indicator flashes.</p> <p>This function requires server support and, therefore, is not available on all phones.</p>
Self-labeled line/programmable feature keys labels	<p>Self-labeled line/programmable key labels are configured for various features on the IP Phones.</p> <p>A steady LCD light beside a line (DN) key indicates the feature or line is active. A flashing LCD indicates the line is on hold or the feature is being programmed.</p>
Context-sensitive soft keys	<p>Context-sensitive soft keys are located below the display area. The LCD label above the key changes, based on the active feature.</p> <p>A triangle before a key label indicates that the key is active.</p>
Fixed feature keys	<p>Use these keys to access non-programmable standard features.</p>
Expand	<p>The Expand key is used to access external server applications, such as Nortel Application Server.</p>
Navigation keys	<p>Use the Navigation keys to scroll through menus and lists that appear on the LCD display screen. The outer part of this key cluster rocks for up, down, left, and right movements.</p> <p>Use Up and Down keys to scroll up and down in lists, and the Left and Right keys to position the cursor. You can also use the Left and Right keys to select editable fields that appear on the phone. Press the Right key to select the field below the current position, or press the Left key to select the field above the current position.</p>
Enter	<p>Press the Enter key, at the center of the Navigation key cluster, to confirm menu selections. In many cases, you can use the Enter key instead of the Select soft key.</p>
Message/Inbox	<p>Press the Message/Inbox key to access your voice mailbox.</p>
Shift/Outbox	<p>The Shift/Outbox key is a fixed key that is reserved for future feature development.</p>
Quit/Stop	<p>Press the Quit/Stop key to end an active application.</p> <p>Pressing the Quit/Stop key does not affect the status of the calls currently on your IP Phone.</p>
Directory	<p>Press the Directory key to access Directory services.</p>

Key	Function
Mute	<p>Press the Mute key to listen to the receiving party without transmitting.</p> <p>Press the Mute key again to return to a two-way conversation.</p> <p>The Mute key applies to Handsfree, Handset, and Headset microphones.</p> <p>The Mute LED flashes when the Mute option is in use.</p>
Headset	<p>Press the Headset key to answer a call using the headset or to switch a call from the handset or Handsfree to the headset.</p> <p>Press the Headset key twice to access Bluetooth Setup menu. If Bluetooth wireless technology is not enabled, this menu is not available.</p>
Volume control keys	<p>Use the Volume control keys to adjust the volume of the handset, headset, speaker, ringer, and Handsfree feature.</p> <p>Press the volume key with the loudspeaker icon to increase volume; press the volume key without the loudspeaker icon to decrease volume.</p>
Copy	<p>Press the Copy Key to copy entries to your Personal Directory from other lists, such as the Caller List, Redial List and Corporate Directory.</p>
Speaker	<p>Press the Handsfree key to activate the speaker.</p>
Handsfree key	<p>Press the Handsfree key to activate handsfree.</p> <p>The LED lights to indicate when the handsfree feature is active.</p>

Services menu

Table 46 "Services menu" (page 339) shows the Services menu.

Table 46
Services menu

Services	<p>Press the Services key to access the following items</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language
----------	---

- Date/Time
- Display diagnostics
- Local Dialpad Tone
- Set Info
- Diagnostics
- Call Log Options
- Ring type
- Call Timer
- OnHook Default Path
- Change Feature Key Label
- Name Display Format
- Live Dialpad
- Virtual Office Login and Virtual Office Logout (if Virtual Office is configured)
- Test Local Mode and Resume Local Mode (if Branch Office is configured)
- Password Admin

If a call is presented while the user is manipulating an option, the IP Phone 1140E rings and the DN key flashes. However, the display is not updated with the Caller ID, and the programming text is not disturbed.

The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID, and Autodial and Last Number Redial intercept the dialpad.

Local Tools menu

Table 47 "Local Tools menu" (page 340) shows the Local Tools menu.

Table 47
Local Tools menu

Press the Services key twice to access the Local Tools menu. The following items appear in the Local Tools menu

1. Preferences
 - a. Display Settings
 - b. Languages
 - c. Bluetooth Setup
2. Local Diagnostics

- a. IP Set&DHCP Information
 - b. Network Diagnostic Tools
 - c. Ethernet Statistics
 - d. IP Network Statistics
 - e. USB Devices
3. Network Configuration
 4. Lock Menu
 - a. Manual Secure Local Menu
 - b. Manual Partial Secure Menu
 - c. Manual Disable Secure Menu
 - d. DHCP Secure Menu
 - e. Lock Now

To make a selection, press the number associated with the menu item, or use the navigation keys to scroll through the menu items. Press the Enter key to select the highlighted menu item.

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 346\)](#).

Press the Quit/Stop key to exit from any menu or menu item.

For information about configuring IP Phone 1140E Local Tools menu, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Supported features

The IP Phone 1140E supports the following telephony features

- six self-labeled line/programmable feature keys with labels and indicators
Supports up to 12 DNs or features on 2 pages. Use the Shift/Outbox key to access the second page of DNs or features.
- four context-sensitive soft keys that provide access to a maximum of nine features
Functions for the context-sensitive soft keys are configured in LD 11.
- high quality speaker phone
- volume control keys to adjust ringer, speaker, handset, and headset volume

- six specialized feature keys
 - Quit/Stop
 - Directory
 - Message/Inbox
 - Shift/Outbox
 - Services
 - Copy
- six call-processing fixed keys
 - Mute
 - Handsfree
 - Goodbye
 - Expand
 - Headset
 - Hold
- Call Duration Timer
- ability to change user-defined feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 1140E supports the following Data network features

- integrated Gigabit Ethernet switch for shared PC access
 - the LAN Ethernet port supports 10/100/1000 Mb/s Full Duplex mode
 - the PC Ethernet port supports 10/100/1000 Mb/s Full Duplex mode

- automatic network configuration through DHCP
For more information about automatic network configuration, see [Table 49 "IP Phone 1140E IP parameters" \(page 356\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP)
For more information about LLDP, [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption
For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).
- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone; allows VLAN and priority tagging for the IP Phone traffic and VLAN tagging for PC traffic
 - VLAN filtering allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.
- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN
For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).
- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 3
- Gratuitous Address Resolution Protocol Protection (GARP)

The IP Phone 1140E supports the following user interface features

- graphical, high-resolution LCD display, backlit, with adjustable contrast
- USB port, to support USB devices
Powered downstream 1.1 compliant USB hubs are supported, including USB 2.0 hubs, if they offer USB 1.1 backwards compliancy.
- Hearing Aid Compatibility (HAC) as per FCC Part 68
- wireless headset support through Bluetooth® 1.2 compliant Audio Gateway Headset Profile
- External Application Server (XAS)

- Graphical External Application Server (GXAS)
- language support: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana

With the appropriate downloaded fonts, the IP Phone supports Arabic, Chinese Simplified, Chinese Traditional, Hebrew, Japanese, and Korean. For more information about language support, see [Appendix "Language enhancement" \(page 527\)](#).

- headset jack with On/Off key
- Expansion Module for IP Phone 1100 Series (Expansion Module)

For more information about the Expansion Module, see ["Expansion Module for IP Phone 1100 Series" \(page 413\)](#).

Features not currently supported

The following features are not supported on the IP Phone 1140E

- Group Listening
- Set-to-Set messaging

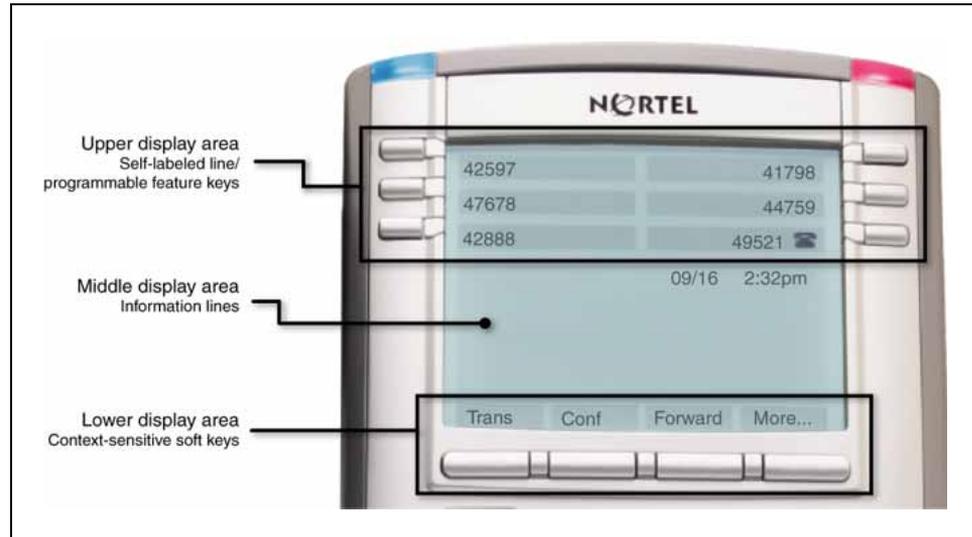
Display characteristics

The IP Phone 1140E has three major display areas

- self-labeled line/programmable feature key label
- information line
- context-sensitive soft key label

[Figure 38 "IP Phone 1140E display area" \(page 345\)](#) shows the three display areas.

Figure 38
IP Phone 1140E display area



Self-labeled line/programmable feature key label display

The feature key label area displays a 10-character string for each of the six feature keys. Each feature key includes the key label and an icon. The icon state can be on, off, or flashing. A telephone icon displays the status of the configured DN. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen. To change the feature key label, press the Services key to access Telephone Options > Change Feature key label option. For more information about changing the feature key label, see the *IP Phone 1140E User Guide (NN43113-106)*.

If a label is longer than 10 characters, the last 10 characters are displayed and the excess characters are deleted from the beginning of the string.

Information line display

The IP Phone 1140E has a three-line information display area with the following information

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state) or Call Timer (if provisioned in the Telephone options menu)

The information in the display area changes, according to the call-processing state and active features.

Context-sensitive soft key label display

The context-sensitive soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Use the More soft key to navigate through the layers of functions. If only four functions are assigned to the soft keys, the More key does not appear, and all four functions are displayed.

Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Local Tools menu password protection

If the SECUREMENU parameter was set during Full DHCP configuration, the Local Tools menu is locked to prevent accidental or unwanted changes. You are prompted to enter the fixed password 26567*738 (color*set) whenever the Services key is double-pressed, or whenever the Local Diagnostics and Network Configuration sub menus are accessed.

If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access 2. Local Diagnostics, or 3. Network Configuration menu items from the Local Tools menu. You are always prompted to enter the fixed password whenever you access the 4. Lock Menu sub menu.

Two ways to control the menu lock are as follows

- DHCP Secure Menu option—the IP Phone processes the secure menu setting retrieved from the Full DHCP response.
- Lock Menu option—double-press the Services key to access the Local Tools menu. Press **4** on the dialpad to access the Lock Menu items, or use the up/down navigation keys to scroll and highlight one of the following Lock Menu options
 - 1. Manual Secure Local Menu
 - 2. Manual Partial Secure Menu

- 3. Manual Disable Secure Menu
- 4. DHCP Secure Menu
- 5. Lock Now

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

For more information about 4. Lock Menu manual user settings, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Configuring Secure Local Menu through Full DHCP

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECURE parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECURE parameter is present, password protection is not enabled.

The SECUREMENU/PARTSECURE item is an optional parameter. If it is present, then the full S4 string needs to be present, including the action and retries. The S4 string is already present if the XAS support has been configured through the DHCP. If XAS is not configured, you can still enable password protection by setting the S4 IP address to 0.0.0.0 and by setting the other fields to 0.

ATTENTION

With Full DHCP, the vendor-specific or site-specific options must be configured depending on the customers DHCP server configuration.

For further information about configuring Full DHCP, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Accessing the Local Tools menu

After you enter the password, the Local Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Local Tools menu without being prompted to reenter the password. To reset the timer before the 5-minute time expires, double-press the Services key.

You can also press the 5 key to select the Lock Now item from the Lock Menu. The Lock Now item immediately exits the Local Tools menu, closes any open Local Tools menu pages, and locks the Local Tools menu. Alternatively, when time expires, the Local Tools menu and any open submenus are closed. Double-press the Services key to open the password prompt window to reaccess the Local Tools menu.

If you enter an incorrect password, the Local Tools menu does not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5-minute time expires.

Some text appears dimmed depending on the current state of the menu lock and the configuration of the IP Phone. Only configuration options that are enabled from the current state appear active. Menu options that are not available appear dimmed.

For more information about configuring the Local Tools menu for the IP Phone 1140E, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Key number assignments

You can assign a maximum of nine functions to the four soft-labeled, predefined soft keys. Because the soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four soft keys. Labels for the soft keys appear in the display area. For further information, see ["Context-sensitive soft key label display" \(page 346\)](#). [Figure 38 "IP Phone 1140E display area" \(page 345\)](#) shows the IP Phone 1140E display area.

Key number mappings at the Call Server align with the IP Phone 2004.

For a description of the IP Phone function assignment for each of the context-sensitive soft keys, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The IP Phone 1140E includes integrated support for a number of Power over Ethernet options, including support for IEEE 802.3af Power Classification 3.

Table 48 "IP Phone 1140E component list" (page 349) lists the IP Phone 1140E package components and product codes.

Table 48
IP Phone 1140E component list

IP Phone 1140E package contents includes		
<ul style="list-style-type: none"> • IP Phone 1140E • handset • handset cord • 2.1 m (7-ft) CAT5 Ethernet cable • Number plate and lens • Getting Started Card 		
IP Phone 1140E with icon keycaps (Graphite)		NTYS05AC
IP Phone 1140E with English keycaps (Graphite)		NTYS05BC
IP Phone 1140E with icon keycaps (Graphite) RoHS		NTYS05ACE6
IP Phone 1140E with English keycaps (Graphite) RoHS		NTYS05BBE6
Replacement parts		
Handset, Charcoal		NTYS09AA70
Handset cord, Charcoal		NTYS10AA70
Footstand kit, Charcoal		NTYS11AA70
Phone number label and lens kit		NTYS12AA
2.1 m (7-ft) CAT5 Ethernet cable		NTYS13AA
Power adapter		
Global power supply		N0089601
IEC cable	RoHS	Non-RoHS
1.8 m (5.9 ft), 10 amp, IEC320-C13 North America	NTYS14AAE6	NTYS14AA
2.4 m (8 ft), 240 VAC 10 amp, ANZ power cord AS-3, Australia, New Zealand	N/A	NTTK15AA
250 VAC, Option 11C Standard European power cord, Other EMEA, Kenya, Korea, Thailand, Indonesia, Vietnam, India, Pakistan	NTTK16ABE6	NTTK16AB
3 m (9.9 ft) 125 VAC, Option 11C Swiss power cord Switzerland	NTTK17ABE6	NTTK17AB
240 VAC, Option 11C UK power cord Hong Kong, Ireland, United Kingdom, Singapore, Malaysia, Bangladesh, Brunei, Sri Lanka	NTTK18ABE6	NTTK18AB

3 m (9.9 ft), 125 VAC, Option 11C Denmark power cord Denmark	NTTK22ABE6	NTTK22AB
Argentina	N/A	A0814961
1.8 m (5.9 ft), 10 amp, IEC320-C13 Japan	NTTK26AAE6	N/A

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 1140E

- Before you begin
- First-time installation
- Configuring the IP Phone 1140E
- Startup sequence
- Installing the IP Phone 1140E

Before you begin

Before installing the IP Phone 1140E, complete the following pre-installation checklist

- Ensure one IP Phone 1140E boxed package exists for each IP Phone 1140E being installed. The package contains
 - IP Phone 1140E
 - handset
 - handset cord
 - 2.1 m (7-ft) CAT5 Ethernet cable
 - Number plate and lens
 - Getting Started Card
- Ensure 1 Software License exists for each IP Phone 1140E being installed.
- Ensure the host Call Server is equipped with a Voice Gateway Media Card and a Signaling Server with the Line TPS application.
- If an AC power adapter is required, ensure the approved Nortel global power supply (model number N0089601) is used. See [Table 48 "IP Phone 1140E component list" \(page 349\)](#).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Damage to Equipment

Do not plug your IP Phone 1140E into an ISDN connection. Severe damage can result.

Configuring the IP Phone 1140E

You must configure the IP Phone 1140E before you can use it. Use [Procedure 73 "Configuring the IP Phone 1140E" \(page 351\)](#) to configure the IP Phone 1140E for the first time.

Procedure 73

Configuring the IP Phone 1140E

Step	Action
------	--------

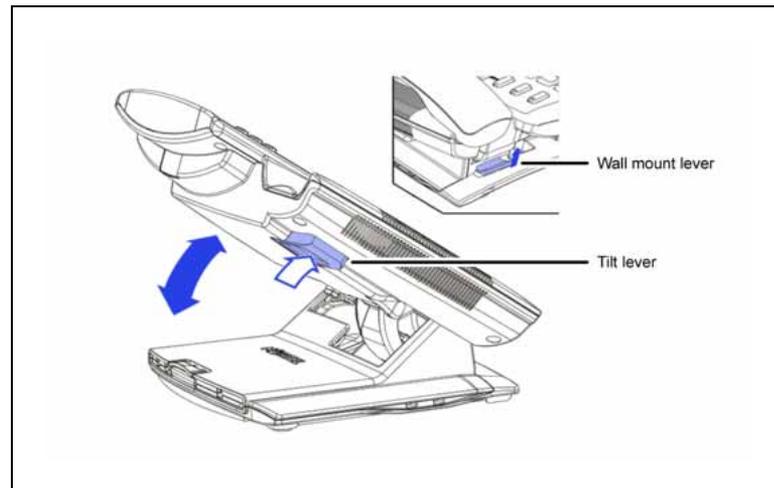
- | | |
|---|--|
| 1 | <p>Configure a virtual loop on the Call Server using LD 97.</p> <p>For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i>.</p> |
| 2 | <p>Configure the IP Phone 1140E on the Call Server using LD 11. At the prompt, enter the following</p> <pre>REQ: chg TYPE: 1140</pre> <p>For more information about configuring the IP Phone 1140E using LD 11, see <i>Software Input Output Administration (NN43001-611)</i>.</p> |



CAUTION

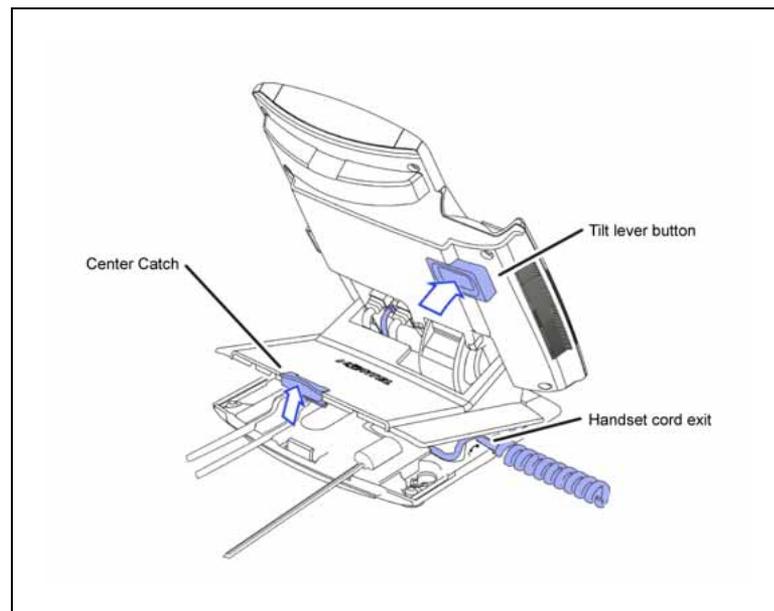
The IP Phone 1140E is shipped with the stand locked in position. To avoid damaging the IP Phone, press the wall-mount lever located under the Handsfree key to release the stand and pull it away from the phone. See [Figure 39 "Release the IP Phone 1140E from the stand" \(page 352\)](#).

Figure 39
Release the IP Phone 1140E from the stand



- 3 Remove the stand cover. Pull upward on the center catch and remove the stand cover. The cable routing tracks are now accessible. See [Figure 40 "Stand cover removed"](#) (page 352).

Figure 40
Stand cover removed



- 4 Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable, and then thread the adapter cord through the channels in the stand.

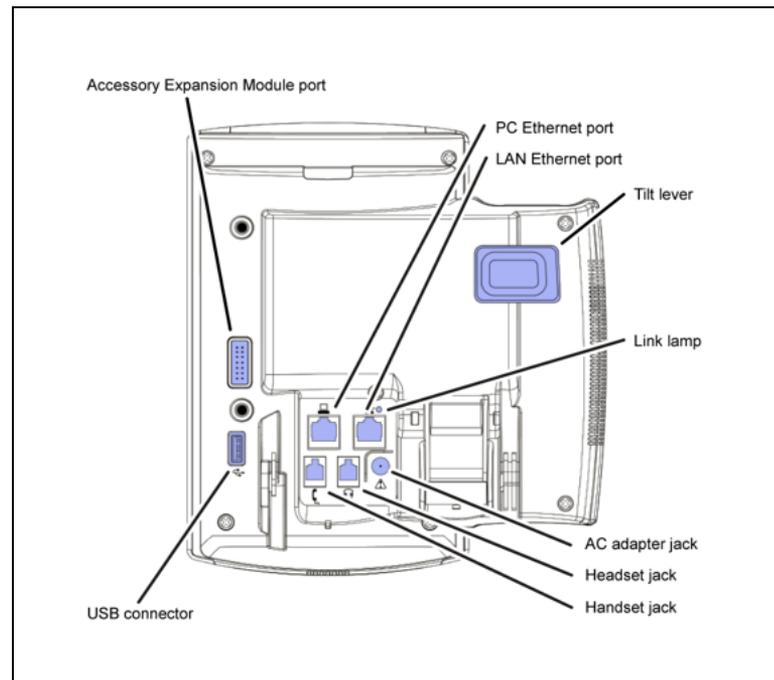
**WARNING**

Use your IP Phone 1140E with the approved Nortel global power supply (model number N0089601).

The IP Phone 1140E supports both AC power and Power over Ethernet options, including IEEE 802.3af Power Classification 3. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

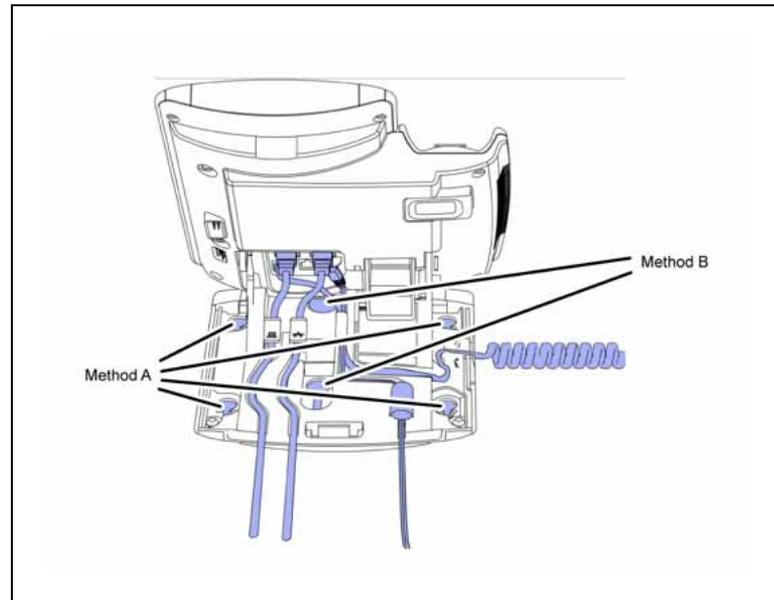
You must use CAT5e (or later) cables if you want to use Gigabit Ethernet.

Figure 41
IP Phone 1140E connections



- 5 Install the handset. Connect the end of the handset cable with the short straight section into the handset. Connect the end of the handset cable with the long straight section to the back of the phone, using the RJ-9 handset jack. Form a small bend in the cable, and then thread the handset cord through the channels in the stand so that it exits behind the handset on the right side, in the channel exit in the stand base marked with the handset symbol. See [Figure 42 "Cable routing tracks"](#) (page 354).

Figure 42
Cable routing tracks



- 6 Install the headset (optional). If you are installing a headset, plug the connector into the RJ-9 headset jack on the back of the phone, and thread the headset cord along with the handset cord through the channels in the stand, so that the headset cord exits the channel marked with the headset symbol. See [Figure 42 "Cable routing tracks" \(page 354\)](#)
- 7 Install the Ethernet cable. Connect one end of the supplied Ethernet cable to the back of your phone using the CAT5 connector (LAN Ethernet port), and thread the network cable through the channel.
- 8 If you are connecting your PC through the phone, a second CAT5 cable is required. Only one cable is included with the IP Phone 1140E package. Install the Ethernet cable connecting the PC to the phone (optional). Connect one end of the PC Ethernet cable to your phone using the CAT5 (PC Ethernet port), and thread it through the channel marked with the symbol. Connect the other end to the LAN connector on the back of your PC.



CAUTION
Damage to Equipment

Do not plug any device into your IP Phone 1140E PC Ethernet port other than a PC. The IP Phone 1140E does not support multiple devices connected through the PC Ethernet port.

- 9** Connect additional cables. If applicable, plug in optional USB devices. Connect the Ethernet cable to the LAN Ethernet connection. If you are using an AC power adapter, plug the adapter into an AC outlet.
- Complete steps 1 to 9, as needed, before wall-mounting the IP Phone.
- 10** Wall-mount your phone (optional). Use Method A or Method B to wall-mount the IP Phone. See Method A—using the mounting holes on the bottom of the phone stand, or Method B—using the traditional-style wall-mount box with a CAT5 connector and a 15 cm (6 inch) CAT5 cord (not provided).
- Method A: Press the wall-mount lever, and pull away from the stand. Using the stand cover (see [step 3](#)), mark the wall-mount holes by pressing the bottom of the stand cover firmly against the wall in the location where you wish to install the phone. Four small pins on the bottom of the stand cover make the marks on the wall. Use the marks as a guideline to install the wall-mount screws (not provided).
- Install the screws so that they protrude 3 mm (1/8 inch) from the wall, and then install the phone stand mounting holes over the screw heads. You may need to remove the phone from the wall to adjust the lower screws. When the lower screws are snug, install the phone on the mounting screws, and then tighten the top screws.
- Method B: Attach the 15 cm (6 inch) CAT5 cable, position the stand over the mounting rivets, and slide the phone down the wall so that the rivets fit into the slots on the stand.
- 11** Replace the stand cover. Ensure that all cables are neatly routed and press the stand cover into place until you hear a click.
- 12** If you wall-mount the phone, put it in the wall-mount position by holding the tilt lever and press the phone towards the base until the phone is parallel with the base. Release the tilt lever and continue to push the phone towards the base until you hear a click. Ensure the phone is securely locked in to position.

—End—

Startup sequence

When an IP Phone 1140E connects to the network, it must perform a startup sequence. The elements of the startup sequence include

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 49 "IP Phone 1140E IP parameters" \(page 356\)](#) for a summary of the IP parameters and how they are obtained.

Table 49
IP Phone 1140E IP parameters

Parameter	Method of acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically obtained through Partial or Full DHCP.
Net Mask	Manually entered or automatically obtained through Partial or Full DHCP.
Default Gateway address	Manually entered or automatically obtained through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically obtained through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Obtained from local storage on subsequent power cycles.

Installing the IP Phone 1140E

To install the IP Phone 1140E, use [Procedure 74 "Installing the IP Phone 1140E" \(page 357\)](#).

ATTENTION**Timing information**

There are approximately 45 second(s) between plugging in the IP Phone 1140E power adapter and the appearance of the text Nortel. When you see the text Nortel on the phone, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 1140E attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the Local diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 346\)](#).

Procedure 74**Installing the IP Phone 1140E****Step Action**

- 1 When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right. The **3. Network Configuration** menu opens.

You can press the **Apply&Reset** soft key to save the following settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the **3. Network Configuration** menu.

When the **3. Network Configuration** menu opens, the **Enable 802.1x (EAP)** check box is highlighted.

- 2 Press the **Enter** key to switch this item on and off. A check mark appears to indicate the item is active.

If 802.1x Authentication is enabled, press the **Enter** key to start the edit mode. Use the dialpad to fill in the following information

 - Device ID
 - Password
 - Retype password

For further information about 802.1x Authentication, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

If you do not enable 802.1x Authentication, you are not prompted to enter Device ID and Password.

- 3 Use the **Right** navigation key to scroll and highlight **Enable 802.1x (LLDP Enable)** check box.

For information about 802.1x Authentication, see [Appendix "802.1ab Link Layer Discovery Protocol"](#) (page 453).

- 4 Use the **Right** navigation key to scroll and highlight **DHCP** list.
- 5 Press the **Enter** key.
- 6 Press the Down navigation key to open list box.
- 7 Use the **Up/Down** navigation keys to scroll and highlight one of the following DHCP options
 - No—disable DHCP support and enter IP network information manually.
 - Partial—IP network information (IP address, network mask, and gateway address) are provided by the DHCP server. Enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers manually.
 - Full—IP network information, Server 1 IP address, Server 2 IP address, and XAS information are provided by the DHCP server. All items are dimmed to prevent manual entry.

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.

For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 8 Press the **Enter** key.
- 9 Use the **Right** navigation key to scroll and highlight **SET IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Set IP—a valid IP Phone 1140E IP address
- 10 Use the **Right** navigation key to scroll and highlight **NET MASK**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Net Mask—a subnet mask
- 11 Use the **Right** navigation key to scroll and highlight **Gateway**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Gateway—the default gateway for the IP Phone 1140E on the LAN segment to which it connects

- 12** Use the **Right** navigation key to scroll and highlight **S1 IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- S1 IP—the primary CS 1000 node IP address for the IP Phone 1140E
- 13** Use the **Right** navigation key to scroll and highlight **Port**.
- S1 Port—a fixed value of 4100
- 14** Use the **Right** navigation key to scroll and highlight **S1 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following
- for TPS only, enter 1
 - for TPS and Secure Media Controller, enter 6 or 1
- For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.
- 15** Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- Retry—the number of times the IP Phone 1140E attempts to connect to the server
- 16** Use the **Right** navigation key to scroll and highlight **S1 PK**.
- S1 PK—the Private key of the Secure Media Controller to which the IP Phone connects
- 17** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Enter 6 or 1.
- For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.
- 18** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffffffffffff.
- 19** Use the **Right** navigation key to scroll and highlight **S2 IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
- S2 IP—the secondary CS 1000 node IP address for the IP Phone 1140E

The IP Phone 1140E can support a primary (S1) and secondary (S1) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*.

- 20** Use the **Right** navigation key to scroll and highlight **Port**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:

Port—same as S1 port

- 21** Use the **Right** navigation key to scroll and highlight **S2 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following

- for TPS only, enter 1
- for TPS and Secure Media Controller, enter 6 or 1

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

- 22** Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:

Retry—same as S1

- 23** Use the **Right** navigation key to scroll and highlight **S2 PK**.

S2 PK—the Private key of the alternate Secure Media Controller to which the IP Phone connects

- 24** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Set the S2 PK to 6 or 1.

- 25** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffffffffffff.

- 26** Use the **Right** navigation key to scroll and highlight **Ntwk Port Speed** box. Press the **Down** navigation key to open the list box.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options

- Auto—Link speed is autonegotiated with the network device
- 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the network
- 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the network

- 27 Use the **Right** navigation key to scroll and highlight **Ntwk Port Duplex** box. Press the **Down** navigation key to open the list box.
- The **Ntwk Port Duplex** option appears dimmed if **Ntwk Port Speed** is set to Auto.
- Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Duplex mode is autonegotiated with the network device
 - Force Full—Duplex mode is forced to Full Duplex on the network device
 - Force Half—Duplex mode is forced to Half Duplex on the network device
- 28 Use the **Right** navigation key to scroll and highlight **Disable Voice 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 29 Use the **Right** navigation key to scroll and highlight **VoiceVLAN** box. Press the **Down** navigation key to open the list box.
- 30 Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- No VLAN
 - DHCP—VLAN ID is configured automatically to one of the values received from the DHCP server
 - LLDP MED—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - Manual
- If LLDP is disabled, LLDP MED and LLDP VLAN Name modes do not appear in the list. If DHCP is disabled, DHCP does not appear in the list.
- 31 Use the **Right** navigation key to scroll and highlight **VLAN Filter** check box.
- VLAN Filter** appears dimmed if **Disable Voice 802.1Q** check box is selected.
- If the VLAN Filter is enabled, packets destined for the IP Phone port are filtered on their MAC address and their VLAN tag. Untagged VLAN packets and tagged VLAN packets that differ from the Telephony VLAN ID are prevented from reaching the IP Phone port.

For information about VLAN tagging, [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 32** Use the **Right** navigation key to scroll and highlight **Ctrl Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **11**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- Ctrl Priority Bits** option appears dimmed if **Disable Voice 802.1Q** check box is selected.
- 33** Use the **Right** navigation key to scroll and highlight **Media Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **11**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- Media Priority Bits** option appears dimmed if **Disable Voice 802.1Q** check box is selected.
- 34** Use the **Right** navigation key to scroll and highlight **Disable PC Port** check box. Press the **Enter** key to switch this item on and off.
- 35** Use the **Right** navigation key to scroll and highlight **PC Port Speed** box. Press the **Down** navigation key to open the list box.
- Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Link speed is autonegotiated with the attached PC
 - 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the PC port.
 - 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the PC port.
- 36** Use the **Right** navigation key to scroll and highlight **PC Port Duplex** box. Press the **Down** navigation key to open the list box. Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Duplex mode is autonegotiated with the attached PC
 - Force Full—Duplex mode is forced to Full Duplex on the PC
 - Force Half—Duplex mode is forced to Half Duplex on the PC
- PC Port Duplex** appears dimmed if the **PC Port Speed** option is set to Auto.
- 37** Use the **Right** navigation key to scroll and highlight **Disable Data 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 38** Use the **Right** navigation key to scroll and highlight **DataVLAN** box. Press the **Down** navigation key to open the list box.

The **DataVLAN** option appears dimmed if **Disable Data 802.1Q** check box is selected.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options

- No VLAN
- LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
- VLAN ID value—manual selection of VLAN ID from 1 to 4094

If LLDP is disabled, LLDP VLAN Name does not appear in the list.

- 39** Press the **Enter** key.
- 40** Use the **Right** navigation key to scroll and highlight **Data Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- 41** Use the **Right** navigation key to scroll and highlight **PC-Port Untag All** check box. Press the **Enter** key to switch this item on and off.
- The **PC-Port Untag All** option appears dimmed if **Disable Data 802.1Q** check box is selected.
- 42** Use the **Right** navigation key to scroll and highlight **Cached IP** check box. Press the **Enter** key to switch this item on and off.
- 43** Use the **Right** navigation key to scroll and highlight the **Enable PSK SRTP** check box. Press the **Enter** key to switch this item on and off.
- The SRTP media encryption feature provides encrypted media. A preshared secret is embedded in the Nortel IP Phone to generate and to exchange encryption parameters without any Call Server involvement.
- For further information about the SRTP media encryption feature, "[SRTP media encryption](#)" (page 429).
- 44** Use the **Right** navigation key to scroll and highlight **Ignore GARP** check box. Press the **Enter** key to switch this item on and off.
- The GARP feature protects the IP Phone from a Gratuitous ARP Spoof attack from the network.
- For more information about GARP, see "[Gratuitous Address Resolution Protocol Protection](#)" (page 367).
- 45** If an External Application Server (XAS) is available in the network, use the **Right** navigation key to scroll and highlight the **XAS IP** list. Use the dialpad to enter the XAS IP address.

The XAS delivers business applications to the IP Phone. For more information about XAS, see Nortel Application Gateway 1000 documentation.

- 46** If the XAS supports graphical displays, use the **Right** navigation key to scroll and highlight **Graphical XAS** check box. Press the **Enter** key to switch this item on and off.
- 47** Use the **Right** navigation key to scroll and highlight **Port** list. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.
- 48** Use the **Right** navigation key to scroll and highlight **Enable Bluetooth** list. Press the **Enter** key. Press the **Down** navigation key to open the list box.
- 49** Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—(default) Bluetooth wireless technology setting received through TFTP configuration
 - Yes—Bluetooth wireless technology is enabled on the IP Phone
 - No—Bluetooth wireless technology is disabled on the IP Phone

For further information about Bluetooth wireless technology, [Appendix "Bluetooth wireless technology" \(page 513\)](#).

- 50** Upgrade the IP Phone 1140E firmware.
- Use the **Right** navigation key to scroll and highlight **TFTP IP** list. The IP Phone 1140E supports remote firmware upgrades through a TFTP process and an automated UFTP process.
- The method to upgrade the firmware depends on the following Call Server software
- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt.
 - For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 1140E searches for the TFTP Server for firmware upgrade. If the file name specified in 1140e.cfg is not the same as the current firmware,

the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 1140E reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5, or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 1140E searches for the connect server.

- 51** The IP Phone 1140E registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 1140E resets.

The current Call Server date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 52** Check for a dial tone and the correct DN on the display.

- 53** (Optional) Customize the feature keys as required. For more information, see *Software Input Output Administration (NN43001-611)* and the *IP Phone 1140E User Guide (NN43113-106)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 75 "Enabling Full Duplex mode" \(page 366\)](#) to enable Full Duplex mode.

Procedure 75
Enabling Full Duplex mode

Step	Action
1	Double-press the Services key to open the Local Tools menu.
2	Press 3 on the dialpad to access the Network Configuration menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
3	Use the Right navigation key to scroll and highlight the Duplex list.
4	Press Enter to start the edit mode.
5	Press the Down navigation key to open list box.
6	Use the Up/Down navigation keys to scroll and highlight one of the following options <ul style="list-style-type: none"> • 10BT Full—10 BT Full Duplex mode • 100BT Full—100 BT Full Duplex mode
7	Press Enter to exit the edit mode.
8	Press the Apply&Reset soft key to save the changes and to restart the IP Phone 1140E. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use [Procedure 76 "Checking Ethernet Statistics" \(page 366\)](#) to confirm activation of Full Duplex mode.

Procedure 76
Checking Ethernet Statistics

Step	Action
1	Double-press the Services key to open the Local Tools menu.

- 2 Press **2** to select **Local Diagnostics**, then press **3** to open the **Ethernet Statistics** menu.

If Full Duplex mode is active, the following is displayed

- Link Status: UP
- Duplex Mode: Full
- Network Speed: 10 MB, 100 MB, or 1 G
- Auto Sense/Negotiate
 - Auto-Negotiate Capability: No
 - Auto-Negotiate Completed: No

—End—

TFTP firmware upgrade

When you enter Cfg TFTP = 1 (for yes), and enter an IP address, the IP Phone searches for an upgrade file on the TFTP Server.

Users of CS 1000 Release 4.5, or later do not need to enter a TFTP IP address.

For further information about TFTP firmware upgrade, see [Appendix "TFTP Server" \(page 529\)](#).

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection protects the IP Phone 1140E from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. The malicious device launches a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 74 "Installing the IP Phone 1140E" \(page 357\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Bluetooth wireless technology

The IP Phone 1140E supports Bluetooth wireless technology. For information about configuring Bluetooth wireless technology on the IP Phone 1140E, see [Appendix "Bluetooth wireless technology" \(page 513\)](#).

Redeploying an IP Phone 1140E

You can redeploy an existing previously configured IP Phone 1140E on the same Call Server. For example, the IP Phone 1140E can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 1140E. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 77

Changing the TN of an existing IP Phone 1140E

Step	Action						
1	<p>Repower the IP Phone 1140E.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 1140E displays the existing node number for approximately five seconds.</p>						
2	<p>If the node password is enabled and NULL, choose one of the following</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. 						
3	<p>Press OK when the node number displays.</p> <table border="0"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>the node password is enabled and is not NULL</td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td>a TN screen displays. Go to Step 5.</td> </tr> </tbody> </table>	If	Then	the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .	the node password is disabled	a TN screen displays. Go to Step 5 .
If	Then						
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .						
the node password is disabled	a TN screen displays. Go to Step 5 .						
4	<p>Enter the password at the password screen, and press OK.</p> <p>A TN screen displays.</p> <p>To obtain the password, enter the nodePwdShow command in Element Manager. For further information, see <i>Element Manager System Reference—Administration (NN43001-632)</i>.</p>						
5	Select the Clear soft key to clear the existing TN.						
6	Enter the new TN.						

—End—

Replacing an IP Phone 1140E

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 1140E that currently uses the TN.

Procedure 78

Replacing an IP Phone 1140E

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 1140E that you want to replace.
3	Follow Procedure 73 "Configuring the IP Phone 1140E" (page 351) to install and configure the IP Phone 1140E.
4	Enter the same TN and Node Number as the IP Phone 1140E you replaced. The Call Server associates the new IP Phone 1140E with the existing TN.

—End—

Removing an IP Phone 1140E from service

Procedure 79

Removing an IP Phone 1140E from service

Step	Action
1	Disconnect the IP Phone 1140E from the network or turn the power off. The service to the PC is disconnected as well if the PC connects to the IP Phone 1140E. If the IP Phone 1140E was automatically configured, the DHCP lease expires and the IP address returns to the available pool.
2	In LD 11, enter OUT at the TN prompt.

—End—

Nortel IP Phone 1150E

Contents

This section contains the following topics:

- "Introduction" (page 372)
- "Description" (page 372)
- "Components and functions" (page 374)
- "Supported features" (page 380)
- "Features not currently supported" (page 383)
- "Display characteristics" (page 383)
- "Headset support" (page 385)
- "Local Tools menu password protection" (page 385)
- "Key number assignments" (page 387)
- "Package components" (page 389)
- "Installation and Configuration" (page 390)
- "Full Duplex mode" (page 406)
- "TFTP firmware upgrade " (page 408)
- "Gratuitous Address Resolution Protocol Protection " (page 408)
- "Extensible Authentication Protocol " (page 409)
- "Bluetooth wireless technology" (page 409)
- "Redeploying an IP Phone 1150E" (page 409)
- "Replacing an IP Phone 1150E" (page 410)
- "Removing an IP Phone 1150E from service" (page 410)

Introduction

This section explains how to install and maintain the IP Phone 1150E. For information about using the IP Phone 1150E, see the *IP Phone 1150E User Guide (NN43114-100)* or the *IP Phone 1150E Getting Started Card (NN43114-101)*.

This section contains the following procedures

- [Procedure 80 "Configuring an IP Phone 1150E" \(page 391\)](#).
- [Procedure 81 "Installing the IP Phone 1150E " \(page 398\)](#).
- [Procedure 82 "Enabling Full Duplex mode" \(page 407\)](#).
- [Procedure 83 "Checking Ethernet Statistics" \(page 408\)](#).
- [Procedure 84 "Changing the TN of an existing IP Phone 1150E" \(page 409\)](#).
- [Procedure 85 "Replacing an IP Phone 1150E" \(page 410\)](#).
- [Procedure 86 "Removing an IP Phone 1150E from service" \(page 410\)](#).

After an IP Phone is installed and configured, if power to the phone is interrupted, you need not reenter the IP parameters, Node Number, TN, or reacquisition of firmware.

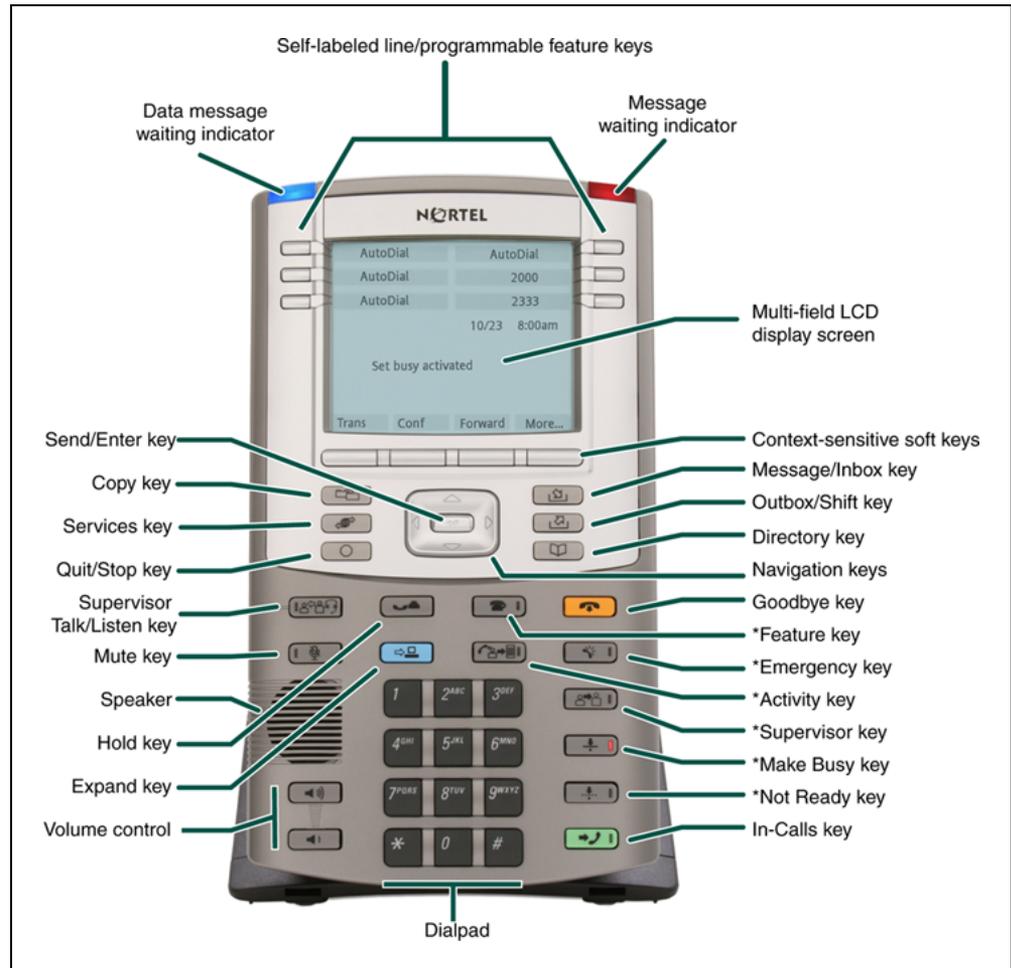
Description

The IP Phone 1150E uses the customer IP data network to communicate with the Communication Server 1000. The IP Phone 1150E translates voice into data packets for transport using Internet Protocol. A Dynamic Host Configuration Protocol (DHCP) server is used to provide information that enables the IP Phone 1150E network connection, and Communication Server 1000 connection.

The IP Phone 1150E is configured for either an Agent, or a Supervisor. The IP Phone 1150E is shipped with Agent key configuration but can be modified to support Supervisor key configuration by replacing the key caps. Remove the key caps using the Key Cap removal tool (product number NTN19AA). For information about IP Phone 1150E components, see ["Package components" \(page 389\)](#).

[Figure 43 "IP Phone 1150E default Agent key configuration" \(page 373\)](#) shows the IP Phone 1150E default Agent key configuration.

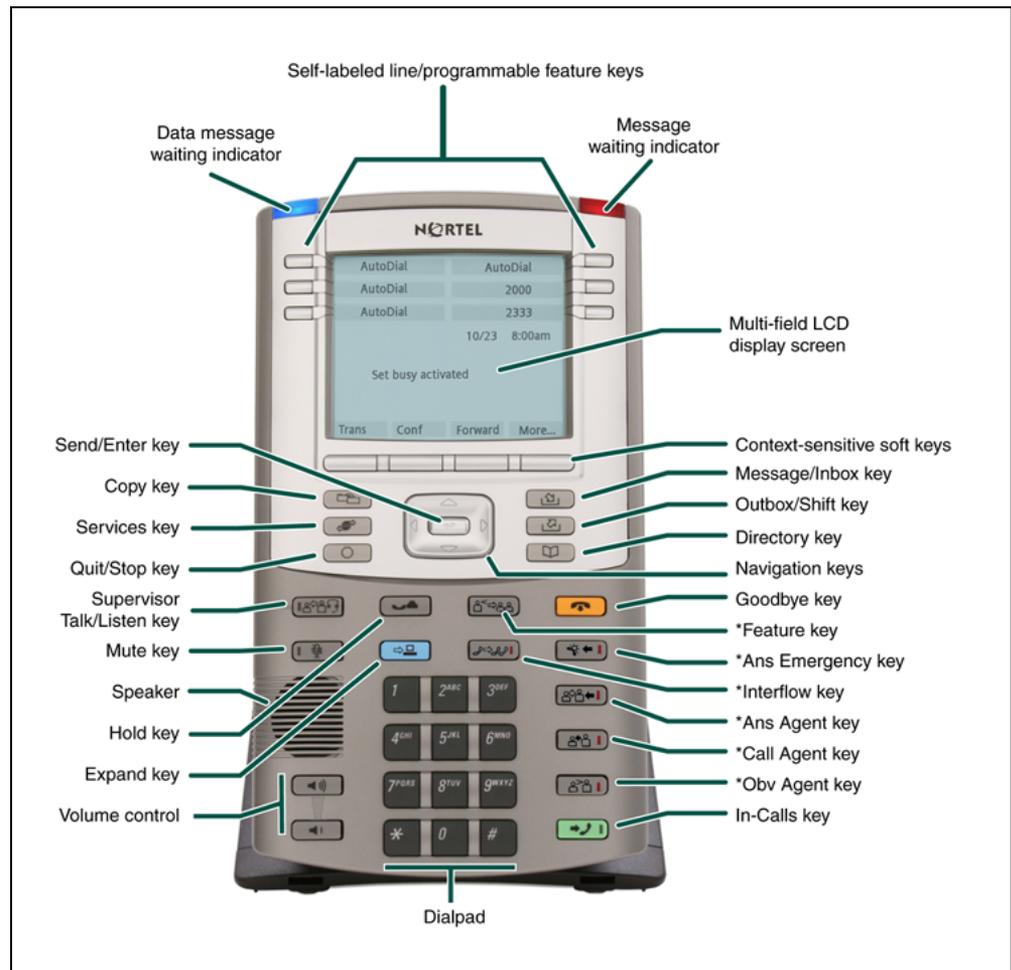
Figure 43
IP Phone 1150E default Agent key configuration



You can program the keys indicated with asterisks for different functions.

Figure 44 "IP Phone 1150E Supervisor key configuration" (page 374) shows the IP Phone 1150E Supervisor key configuration.

Figure 44
IP Phone 1150E Supervisor key configuration



You can program the keys indicated with asterisks for different functions.

Components and functions

This section describes the following components of the IP Phone 1150E

- Keys and functions
- Services menu
- Local Tools menu

Table 50 "IP Phone 1150E keys and functions" (page 375) shows the keys and functions for the IP Phone 1150E.

Table 50
IP Phone 1150E keys and functions

Key	Function
Hold	Press the Hold key to put an active call on hold. Press the Line (DN) key beside the flashing LCD to return to the caller on hold.
Goodbye	Press the Goodbye key to terminate an active call.
Visual Alerter/Message waiting indicator	When a message is waiting, the red Visual Alerter/Message waiting indicator lights. Also, when the ringer sounds, this indicator flashes.
Feature Status Lamp indicator	When the firmware is updating, the blue Feature Status Lamp indicator flashes.
Self-labeled line/programmable feature keys labels	Self-labeled line/programmable feature key labels are configured for various features on IP Phones. A steady LCD light beside a line (DN) key indicates that the feature or line is active. A flashing LCD indicates the line is on hold, or the feature is being programmed.
Context-sensitive soft keys	Context-sensitive soft keys are located below the display area. The LCD label above the key changes, based on the active feature. A triangle before a key label indicates that the key is active.
Fixed feature keys	Use these keys to access non-programmable features.
Expand	The Expand key is used to access external server applications, such as Nortel Application Server.
Navigation keys	Use the Navigation keys to scroll through menus and lists that appear on the LCD display screen. The outer part of this key cluster rocks for up, down, left, and right movements. Use Up and Down keys to scroll up and down in lists, and use the Left and Right keys to position the cursor. You can also use the Left and Right keys to select editable fields that appear on the phone. Press the Right key to select the field below the current position, or press the Left key to select the field above the current position.
Enter	Press the Enter key, at the center of the Navigation key cluster, to confirm menu selections. In many cases, you can use the Enter key instead of the Select soft key.
Message/Inbox	Press the Message/Inbox key to access your voice mailbox.

Key	Function
Shift/Outbox	Press the Shift/Outbox key to switch between two feature key pages, or any Expansion Modules for IP Phones 1100 Series attached to the phone.
Copy	Press the Copy Key to copy entries to your Personal Directory from other lists, such as the Caller List, Redial List and Corporate Directory.
Quit/Stop	Press the Quit/Stop key to end an active application. Pressing the Quit/Stop key does not affect the status of the calls currently on your IP Phone.
Directory	Press the Directory key to access Directory services.
Mute	Press the Mute key to listen to the receiving party without transmitting. Press the Mute key again to return to a two-way conversation. The Mute key applies to Headset microphones. The Mute LED flashes when the Mute option is in use.
Volume control keys	Use the Volume control keys to adjust the volume of the headset, ringer, and alerter/pager. Press the volume key with the plus sign icon to increase volume; press the volume key with the minus sign icon to decrease volume.
Supervisor Talk/Listen key	For Supervisor use. Press the Supervisor Talk/Listen key to participate in an active conversation. The LED lights to indicate talk/listen mode is on. If the LED is off, the Supervisor can only listen to an active conversation. A headset must be connected to the Supervisor port on the IP Phone 1150E to use this feature.
In-Calls key	Press the In-Calls key to answer incoming calls. This mirrors the key function and state of the Primary DN key. The In-Calls LED lights when the In-Calls key is in use.

Agent default configuration

Table 51 "IP Phone 1150E keys and functions for default Agent key configuration" (page 377) shows IP Phone 1150E keys and functions for default Agent key configuration. You can configure these keys for different functions.

Table 51
IP Phone 1150E keys and functions for default Agent key configuration

Key	Function
Activity key	Press the Activity key and enter the appropriate activity code to record the activity the agent is performing. This key is reserved for future implementation.
Feature key	The Feature key supports the assignment of any telephony feature. This key is reserved for future implementation.
Not Ready	Press the Not Ready key to exit the Automatic Call Distribution (ACD) queue without logging out.
Make Set Busy	Press the Make Set Busy key to log out of the ACD queue and agent position.
Supervisor	Press the Supervisor key to open a direct line between the agent IP Phone and the supervisor IP Phone.
Emergency	Press the Emergency key to place an emergency call to the Supervisor.

Supervisor key configuration

Table 52 "IP Phone 1150E keys and functions for Supervisor key configuration" (page 377) shows IP Phone 1150E components and functions for Supervisor key configuration. You can configure these keys for different functions.

Table 52
IP Phone 1150E keys and functions for Supervisor key configuration

Key	Function
Display Agents	Press the Dsply Agents key to obtain a summary of the current status of all agent positions.
Interflow	Press the Interflow key to forward calls to a predefined target queue when the call backlog, or the waiting time in the queue exceeds a set threshold.
Answer Emergency	Press the Ans Emerg key to join the agent in an emergency situation call.
Answer Agent	The Ans Agent key corresponds to the agent Supervisor key. Press the Ans Agent key to open the direct line between the Supervisor and the agent.

Key	Function
Call Agent	Press the Call Agent key to connect to an agent position.
Observe Agent	Press the Obv Agent key to monitor activity on the agent phone.

Services menu

Table 53 "Services menu" (page 378) shows the Services menu.

Table 53
Services menu

<p>Press the Services key to access the following items</p> <ul style="list-style-type: none"> • Telephone Options <ul style="list-style-type: none"> — Volume Adjustment — Contrast Adjustment — Language — Date/Time — Display diagnostics — Local Dialpad Tone — Set Info — Diagnostics — Headset Type — Call Log Options — Ring type — Call Timer — Call Indicator Light — Change Feature Key Label — Name Display Format — Live Dialpad • Virtual Office Login and Virtual Office Logout (if Virtual Office is configured) • Test Local Mode and Resume Local Mode (if Branch Office is configured) • Password Admin
--

If a call is presented while the user is manipulating an option, the IP Phone 1150E rings and the DN key flashes. However, the display is not updated with the Caller ID, and the programming text is not disturbed.

The user can originate a call using Autodial or Last Number Redial while manipulating an option. However, the display is not updated with the dialed digits or the Caller ID, and Autodial and Last Number Redial intercept the dialpad.

Local Tools menu

Table 54 "Local Tools menu" (page 379) shows the Local Tools menu.

Table 54
Local Tools menu

Press the Services key twice to access the Local Tools menu. The following items appear in the Local Tools menu

1. Preferences
 - a. Display Settings
 - b. Languages
 - c. Bluetooth Setup
2. Local Diagnostics
 - a. IP Set&DHCP Information
 - b. Network Diagnostic Tools
 - c. Ethernet Statistics
 - d. IP Network Statistics
 - e. USB Devices
3. Network Configuration
4. Lock Menu
 - a. Manual Secure Local Menu
 - b. Manual Partial Secure Menu
 - c. Manual Disable Secure Menu
 - d. DHCP Secure Menu
 - e. Lock Now

To make a selection, press the number associated with the menu item or use the navigation keys to scroll through the menu items. Press the Enter key to select the highlighted menu item.

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see "[Local Tools menu password protection](#)" (page 385)

Press the Quit/Stop key to exit from any menu or menu item.

For information about configuring IP Phone 1150E Local Tools menu, see [Appendix "Configuring the Local Tools menu"](#) (page 455).

Supported features

The IP Phone 1150E supports the following telephony features

- six self-labeled line/programmable feature keys with labels and indicators

Supports up to 12 DNs or features on two pages. Use the Shift/Outbox key to access the second page of DNs or features.

- four context-sensitive soft keys that provide access to a maximum of nine features

Functions for the context-sensitive soft keys are configured in LD 11.

- seven specialized feature keys

- Copy
- Services
- Quit/Stop
- Shift/Outbox
- Inbox/Message
- Directory
- Feature key (reserved for future implementation)

- seven dedicated Automatic Call Distribution (ACD) fixed keys for default Agent key configuration with an integrated LED

- Supervisor Talk/Listen
- Emergency
- Supervisor
- Make Busy
- Not Ready
- In-Calls

- Activity (reserved for future implementation)
- eight dedicated ACD fixed keys for Supervisor key configuration with an integrated LED
 - Supervisor Talk/Listen
 - Display Agents
 - Interflow
 - Answer Emergency
 - Answer Agent
 - Call Agent
 - Observe Agent
 - In-Calls
- five call-processing fixed keys
 - Mute
 - Release
 - Expand
 - Hold
 - Volume increase/decrease
- Call Duration Timer
- ability to change user-defined feature key labels
- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- Virtual Office
- Branch Office
- Active Call Failover
- Enhanced UNISlim Firmware Download
- Live Dialpad

The IP Phone 1150E supports the following Data network features

- integrated Gigabit Ethernet switch for shared PC access

- the LAN Ethernet port supports 10/100/1000 Mb/s Full Duplex mode
- the PC Ethernet port supports 10/100/1000 Mb/s Full Duplex mode
- automatic network configuration through DHCP
For more information about automatic network configuration, see [Table 58 "IP Phone 1150E IP parameters" \(page 397\)](#).
- 802.1ab Link Layer Discovery Protocol (LLDP)
For more information about LLDP, [Appendix "802.1ab Link Layer Discovery Protocol" \(page 453\)](#).
- Secure Real-time Transport Protocol (SRTP) media encryption
For more information about SRTP media encryption, see ["Features overview" \(page 425\)](#).
- 802.1Q VLAN and 802.1p priority support, industry standards to manage bandwidth use
 - full VLAN capability, including a manageable integrated switch in the IP Phone; allows VLAN and priority tagging for the IP Phone traffic and VLAN tagging for PC traffic
 - VLAN filtering which allows the IP Phone to see Voice VLAN traffic only. The integrated switch passes DATA VLAN traffic to the PC Ethernet port. This prevents the Data VLAN broadcast traffic from reaching the IP Phone. For more information, see [Appendix "802.1Q VLAN description" \(page 443\)](#) and *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.
- 802.1x Port-based network access control, industry standards to pass Extensible Authentication Protocol (EAP) over a LAN
For more information about 802.1x port-based network access control, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).
- integrated hardware to support Power over Ethernet (PoE) for IEEE 802.3af Power Classification 3
- Gratuitous Address Resolution Protocol Protection (GARP)

The IP Phone 1150E supports the following user interface features

- graphical, high-resolution LCD display, backlit, with adjustable contrast
- USB port, to support USB devices
Powered downstream 1.1 compliant USB hubs are supported, including USB 2.0 hubs, if they offer USB 1.1 backwards compliancy.
- Hearing Aid Compatibility (HAC) as per FCC Part 68

- wireless device support (Agent port, *only*) through Bluetooth® 1.2 compliant Audio Gateway Headset Profile
- External Application Server (XAS)
- Graphical External Application Server (GXAS)
- language support: English, French, Swedish, Danish, Norwegian, German, Greek, Dutch, Portuguese, Czech, Finnish, Hungarian, Italian, Polish, Spanish, Russian, Latvian, Turkish, and Katakana

With the appropriate downloaded fonts, the IP Phone supports Arabic, Chinese Simplified, Chinese Traditional, Hebrew, Japanese, and Korean. For more information about language support, see [Appendix "Language enhancement" \(page 527\)](#).

- Expansion Module for IP Phone 1100 Series (Expansion Module)

For more information about the Expansion Module, see "[Expansion Module for IP Phone 1100 Series](#)" (page 413).

Features not currently supported

The following features are not supported on the IP Phone 1150E

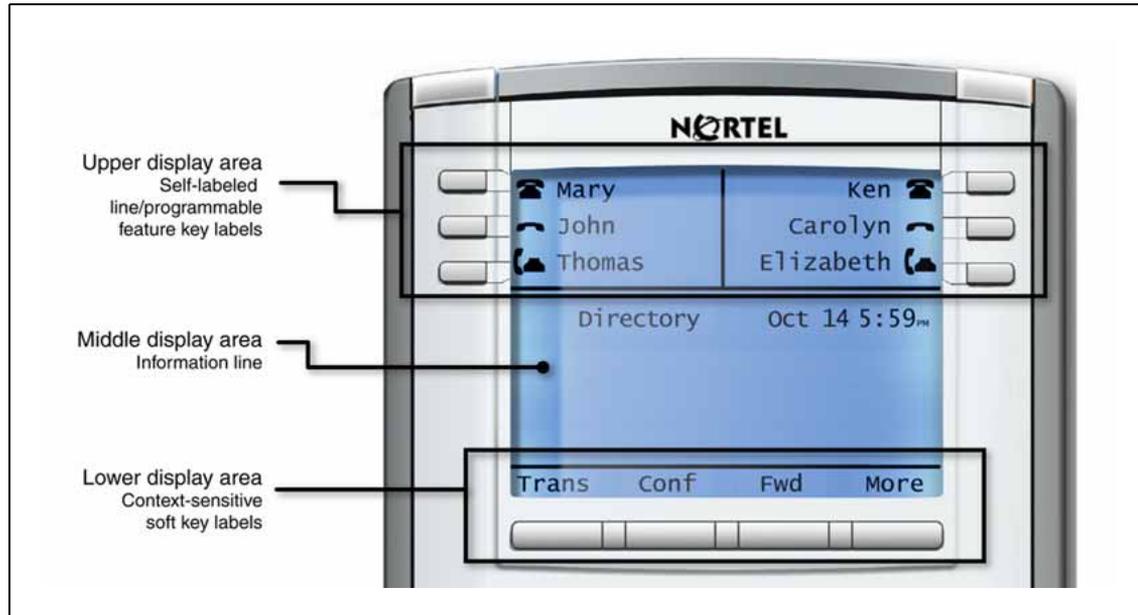
- Group Listening
- Set-to-Set messaging
- dedicated handset port
- handsfree operation

Display characteristics

An IP Phone 1150E has three major display areas

- self-labeled line/programmable feature key label
- information line
- context-sensitive soft key label

Figure 45
IP Phone 1150E display area



Self-labeled line/programmable feature key label

The self-labeled line/programmable feature key label area displays a 10-character string for each of the six self-labeled line/programmable feature keys. Each self-labeled line/programmable feature key includes the key label and an icon. The icon state can be on, off, or flashing. A telephone icon displays the status of the configured DN. Key labels are left-aligned for keys on the left side of the screen, and right-aligned for keys on the right side of the screen. To change the self-labeled line/programmable feature key label, press the Services key to access Telephone Options > Change Feature key label option. For more information about changing the feature key label, see the *IP Phone 1150E User Guide (NN43114-100)*.

If a label is longer than 10 characters, the last 10 characters are displayed, and the excess characters are deleted from the beginning of the string.

Information line display

An IP Phone 1150E has a four-line information display area with the following information

- caller number
- caller name
- feature prompt strings
- user-entered digits
- date and time information (if the IP Phone is in an idle state), or Call Timer (if provisioned in the Telephone options menu)

The information in the display area changes, according to the call-processing state and active features.

Context-sensitive soft key label

The context-sensitive soft key label has a maximum of seven characters. Each soft key includes the soft key label and an icon. When a soft key is in use, a triangle icon displays at the beginning of the soft key label, and the label shifts one character to the right. (If the label is six characters in length, the last, or rightmost character is truncated.) If a feature is enabled, the icon state turns to On. It remains in the on state until the feature key is pressed again. This cancels the enabled feature and turns the icon off, returning the soft key label to its original state.

Use the More soft key to navigate through the layers of functions. If there are only four functions assigned to the soft keys, the More key does not appear, and all four functions are displayed.

Cleaning the IP Phone display screen

Gently wipe the IP Phone display screen with a soft, dry cloth.



CAUTION

Use no any liquids or powders on the IP Phone. Using anything other than a soft, dry cloth can contaminate IP Phone components and cause premature failure.

Headset support

Press the Services key to open the Telephone Options menu and to access the Headset Type menu item.

The IP Phone 1150E supports the following headsets

- Type 1: Plantronics P251N, P261N, CS55, Voyager 510S
- Type 2: GNNetcom GN 2120 NCD, GN9120 Flex
- GNNetcom Liberation

Local Tools menu password protection

If the SECUREMENU parameter was set during Full DHCP configuration, the Local Tools menu is locked to prevent accidental or unwanted changes. You are prompted to enter the fixed password 26567*738 (color*set) whenever the Services key is double-pressed, or whenever the Local Diagnostics and Network Configuration sub menus are accessed.

If the PARTSECURE parameter was set during Full DHCP configuration, you are prompted to enter the fixed password whenever you access 2. Local Diagnostics, or 3. Network Configuration menu items from the Local Tools menu. You are always prompted to enter the fixed password whenever you access the 4. Lock Menu sub menu.

There are two ways to control the menu lock

- DHCP Secure Menu option—the IP Phone processes the secure menu setting retrieved from the Full DHCP response.
- Lock Menu option—double-press the Services key to access the Local Tools menu. Press 4 on the dialpad to access the Lock Menu items, or use the up/down navigation keys to scroll and highlight one of the following Lock Menu options
 - 1. Manual Secure Local Menu
 - 2. Manual Partial Secure Menu
 - 3. Manual Disable Secure Menu
 - 4. DHCP Secure Menu
 - 5. Lock Now

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

For more information about 4. Lock Menu manual user settings, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Configuring Secure Local Menu through Full DHCP

Password protection is enabled during Full DHCP configuration if the SECUREMENU parameter, or the PARTSECURE parameter are present at the end of the S4 part of the Full DHCP string. If neither the SECUREMENU parameter, nor the PARTSECURE parameter is present, password protection is not enabled.

The SECUREMENU/PARTSECURE item is an optional parameter. If it is present, then the full S4 string needs to be present, including the action and retries. The S4 string is already present if the XAS support has been configured through the DHCP. If XAS is not configured, you can still enable password protection by setting the S4 IP address to 0.0.0.0 and by setting the other fields to 0.

ATTENTION

With Full DHCP, the vendor-specific or site-specific options must be configured depending on the customers DHCP server configuration.

For further information about configuring Full DHCP, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Accessing the Local Tools menu

After you enter the password, the Local Tools menu remains active for 5 minutes. You can freely navigate, exit and reenter the Local Tools menu without being prompted to reenter the password. To reset the timer before the 5-minute time expires, double-press the Services key.

You can also press the 5 key to select the Lock Now item from the Lock Menu. The Lock Now item immediately exits the Local Tools menu, closes any open Local Tools menu pages, and locks the Local Tools menu. Alternatively, when time expires, the Local Tools menu and any open submenus are closed. Double-press the Services key to open the password prompt window to reaccess the Local Tools menu.

If you enter an incorrect password, the Local Tools menu does not open. Double-press the Services key to open the password prompt window. Only three incorrect password entries are allowed. Any entry after the three attempts is ignored for 5 minutes. The password prompt window is visible and you can reenter the password but the password is not processed until the 5-minute time expires.

Some text appears dimmed depending on the current state of the menu lock and the configuration of the IP Phone. Only configuration options that are enabled from the current state appear active. Menu options that are not available appear dimmed.

For more information about configuring the Local Tools menu for the IP Phone 1150E, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

Key number assignments

This section describes the following keys supported on the IP Phone 1150E

- self-labeled line/programmable feature keys
- ACD fixed feature keys
- soft keys

Self-labeled line/programmable feature keys

The IP Phone 1150E has six self-labeled line/programmable feature keys, which can support up to 12 DNs or features on two pages. When a call is presented on a feature key which is not currently shown, the message *Shift for Call* appears in the display area. Press the Shift/Outbox key to access the second page of a feature or DNs, or to access any Expansion Module 1100s attached to the phone.

The six self-labeled line/programmable feature keys are numbered 0-5 for the first key page, and 6 to 11 for the second key page.

When key 0 is programmed as the ACD In-Calls key, the default features are assigned to the Automatic Call Distribution (ACD) fixed keys.

ACD fixed feature keys

Key numbers 12 to 15 are used for the ACD fixed features. See [Table 55 "ACD default Agent fixed feature keys" \(page 388\)](#) for a list of the ACD default Agent fixed feature keys or [Table 56 "Supervisor fixed feature keys" \(page 388\)](#) for a list of Supervisor fixed feature keys.

For a description of supported call features, see [Appendix "Call features" \(page 547\)](#).

Table 55
ACD default Agent fixed feature keys

Key number	Response	Description
Key 12	NRD	Not Ready
Key 13	MSB	Make Set Busy
Key 14	ASP	Call Supervisor
Key 15	EMR	Emergency

The In-Calls key mirrors the programming of key 0; it is not separately programmable.

Table 56
Supervisor fixed feature keys

Key number	Response	Description
Key 12	OBV	Observe Agent
Key 13	RAG	Call Agent
Key 14	AAG	Answer Agent
Key 15	AMG	Answer Emergency

Soft keys

You can assign a maximum of nine functions to the four soft-labeled, predefined soft keys. Because the soft keys are predefined, the user cannot change the key number assignment. Functions are assigned to the soft keys in layers in LD 11.

The Message Waiting key is numbered 16.

Functions mapped to key numbers 17 to 26 are assigned to the four soft keys. Labels for the soft keys appear in the display area. For further information, see ["Context-sensitive soft key label" \(page 385\)](#). [Figure 45 "IP Phone 1150E display area" \(page 384\)](#) shows the IP Phone 1150E display area.

Key number mappings at the Call Server align with the IP Phone 2004.

For a description of the IP Phone function assignment for each soft key, see [Appendix "IP Phone context-sensitive soft keys" \(page 545\)](#).

Package components

The IP Phone 1150E includes integrated support for a number of Power over Ethernet options, including support for IEEE 802.3af Power Classification 3.

[Table 57 "IP Phone 1150E component list" \(page 389\)](#) lists the IP Phone 1150E package components and product codes.

Table 57
IP Phone 1150E component list

IP Phone 1150E package contents includes	
<ul style="list-style-type: none"> • IP Phone 1150E • 2.1 m (7-ft) CAT5 Ethernet cable • Getting Started Card 	
If you are using local power, the approved Nortel global power supply and a standard local power cord must be ordered separately.	
IP Phone 1150E with Agent icon keycaps	NTYS06AA
IP Phone 1150E with English keycaps	NTYS06BA
IP Phone 1150E with Supervisor icon key caps	NTYS15AAE6
Replacement parts	
Footstand kit, Charcoal	NTYS11BA70
2.1 m (7-ft) CAT5 Ethernet cable	NTYS13AA
Accessories	
Key cap removal tool	NTNM19AA
Expansion Module for IP Phone 1100 Series	NTYS08AA

Power adapter		
Global power supply		N0089601
IEC cable	RoHS	Non-RoHS
1.8 m (5.9 ft), 10 amp, IEC320-C13 North America	NTYS14AAE6	NTYS14AA
2.4 m (8 ft), 240 VAC 10 amp, ANZ power cord AS-3, Australia, New Zealand	N/A	NTTK15AA
250 VAC, Option 11C Standard European power cord, Other EMEA, Kenya, Korea, Thailand, Indonesia, Vietnam, India, Pakistan	NTTK16ABE6	NTTK16AB
3 m (9.9 ft) 125 VAC, Option 11C Swiss power cord Switzerland	NTTK17ABE6	NTTK17AB
240 VAC, Option 11C UK power cord Hong Kong, Ireland, United Kingdom, Singapore, Malaysia, Bangladesh, Brunei, Sri Lanka	NTTK18ABE6	NTTK18AB
3 m (9.9 ft), 125 VAC, Option 11C Denmark power cord Denmark	NTTK22ABE6	NTTK22AB
Argentina	N/A	A0814961
1.8 m (5.9 ft), 10 amp, IEC320-C13 Japan	NTTK26AAE6	N/A

Installation and configuration

The following sections provide a step-by-step guide to install and configure the IP Phone 1150E

- Before you begin
- First-time installation
- Configuring the IP Phone 1150E
- Startup sequence
- Installing the IP Phone 1150E

Before you begin

Before installing the IP Phone 1150E, complete the following pre-installation checklist

- Ensure one IP Phone 1150E boxed package exists for each IP Phone 1150E being installed. The package contains
 - IP Phone 1150E
 - 2.1 m (7-ft) CAT5 Ethernet cable

— Getting Started Card

- Ensure 1 Software License exists for each IP Phone 1150E being installed.
- Ensure the host Call Server is equipped with a voice Gateway Media Card and a Signaling Server with the Line TPS application.
- If an AC power adapter is required, ensure the approved Nortel global power supply (model number N0089601) is used. See [Table 57 "IP Phone 1150E component list"](#) (page 389).

First-time installation

You must first install an IP telephony node with the Communication Server. For information about installing an IP telephony node, see *Signaling Server Installation and Commissioning (NN43001-312)* or *IP Line Fundamentals (NN43100-500)*.



CAUTION

Damage to Equipment

Do not plug your IP Phone 1150E into an ISDN connection. Severe damage can result.

Configuring the IP Phone 1150E

You must configure the IP Phone 1150E before you can use it. Use [Procedure 80 "Configuring an IP Phone 1150E"](#) (page 391) to configure the IP Phone 1150E for the first time.

Procedure 80

Configuring an IP Phone 1150E

Step	Action
------	--------

- | | |
|---|---|
| 1 | Configure a virtual loop on the Call Server using LD 97.

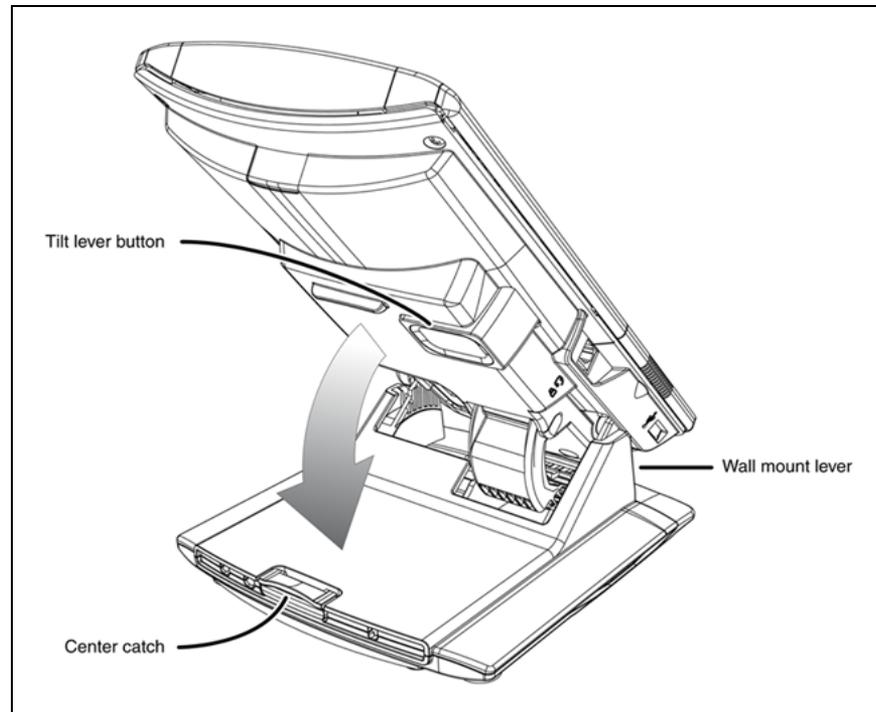
For more information about configuring a virtual loop, see <i>IP Line Fundamentals (NN43100-500)</i> and <i>Software Input Output Administration (NN43001-611)</i> . |
| 2 | Configure the IP Phone 1150E on the Call Server using LD 11. At the prompt, enter the following:

<pre>REQ: chg TYPE: 1150</pre> For more information about configuring the IP Phone 1150E using LD 11, see <i>Software Input Output Administration (NN43001-611)</i> . |

**CAUTION**

The IP Phone 1150E is shipped with the stand locked in position. To avoid damaging the IP Phone, press the wall-mount lever located under the base to release the stand and pull it away from the phone.

Figure 46
Release the IP Phone 1150E from the stand

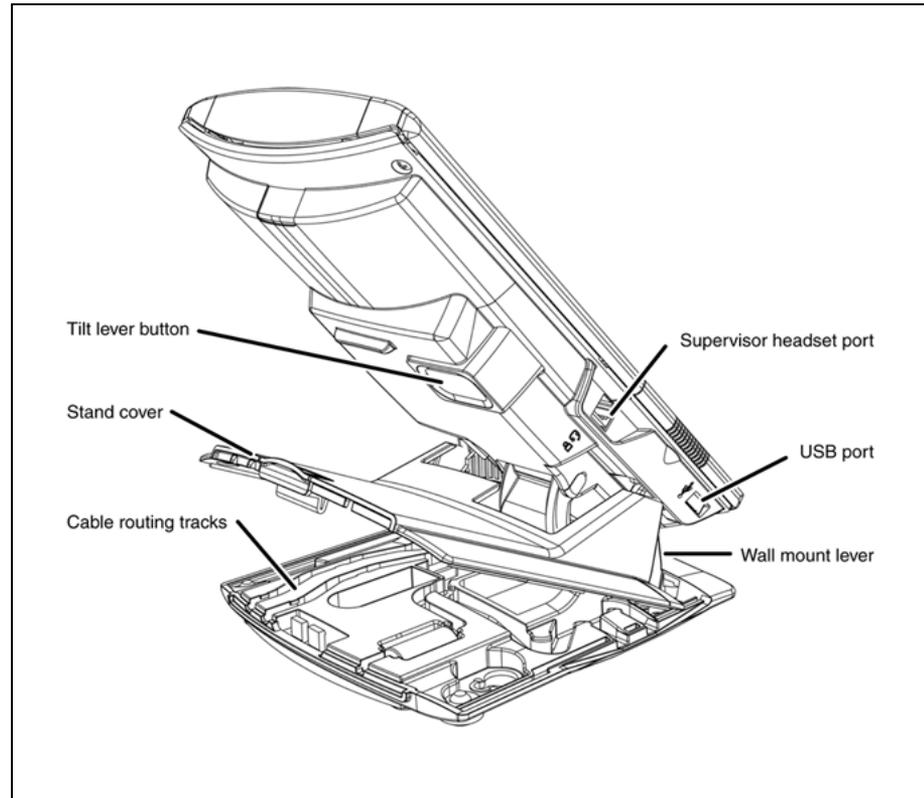


—End—

Step	Action
------	--------

- | | |
|---|--|
| 1 | Remove the stand cover. Pull upward on the center catch and remove the stand cover. The cable routing tracks are now accessible. See Figure 47 "Remove the stand cover" (page 393) . |
|---|--|

Figure 47
Remove the stand cover



- 2 Connect the AC power adapter (optional). Leave the AC adapter unplugged from the power outlet, connect the adapter to the AC adapter jack in the bottom of the phone. Form a small bend in the cable, and then thread the adapter cord through the channels in the stand.



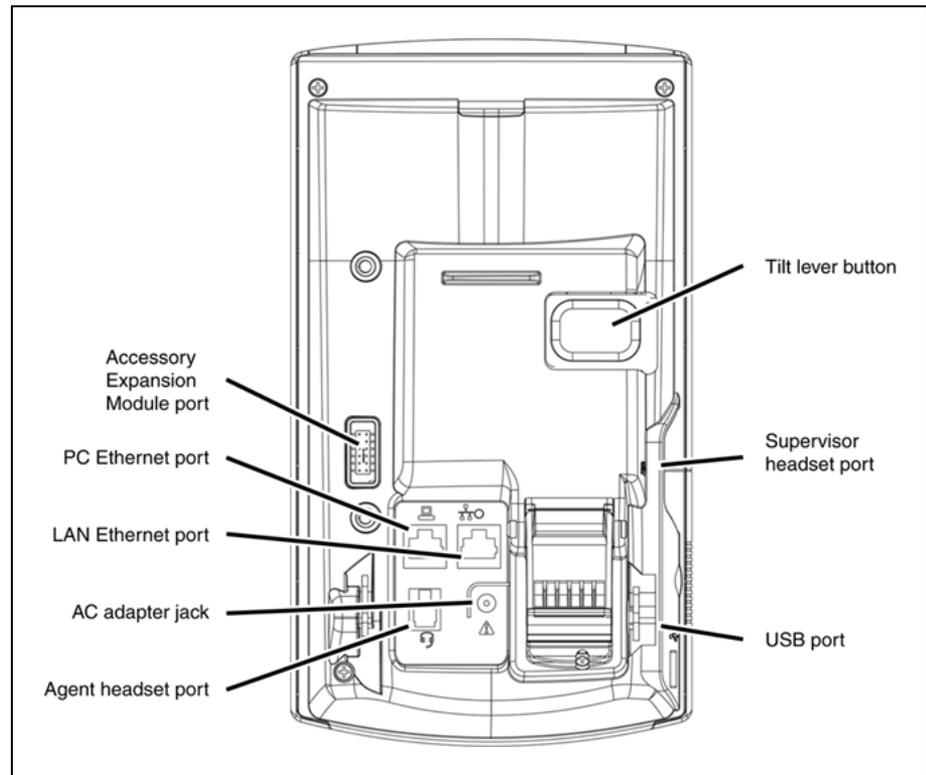
WARNING

Use your IP Phone 1150E with the approved Nortel global power supply (model number N0089601).

The IP Phone 1150E supports both AC power and Power over Ethernet options, including IEEE 802.3af Power Classification 3. To use Power over Ethernet, where power is delivered over the CAT5 cable, the LAN must support Power over Ethernet, and an AC adapter is not required. To use local AC power, the optional AC adapter can be ordered separately.

You must use CAT5e (or later) cables if you want to use Gigabit Ethernet.

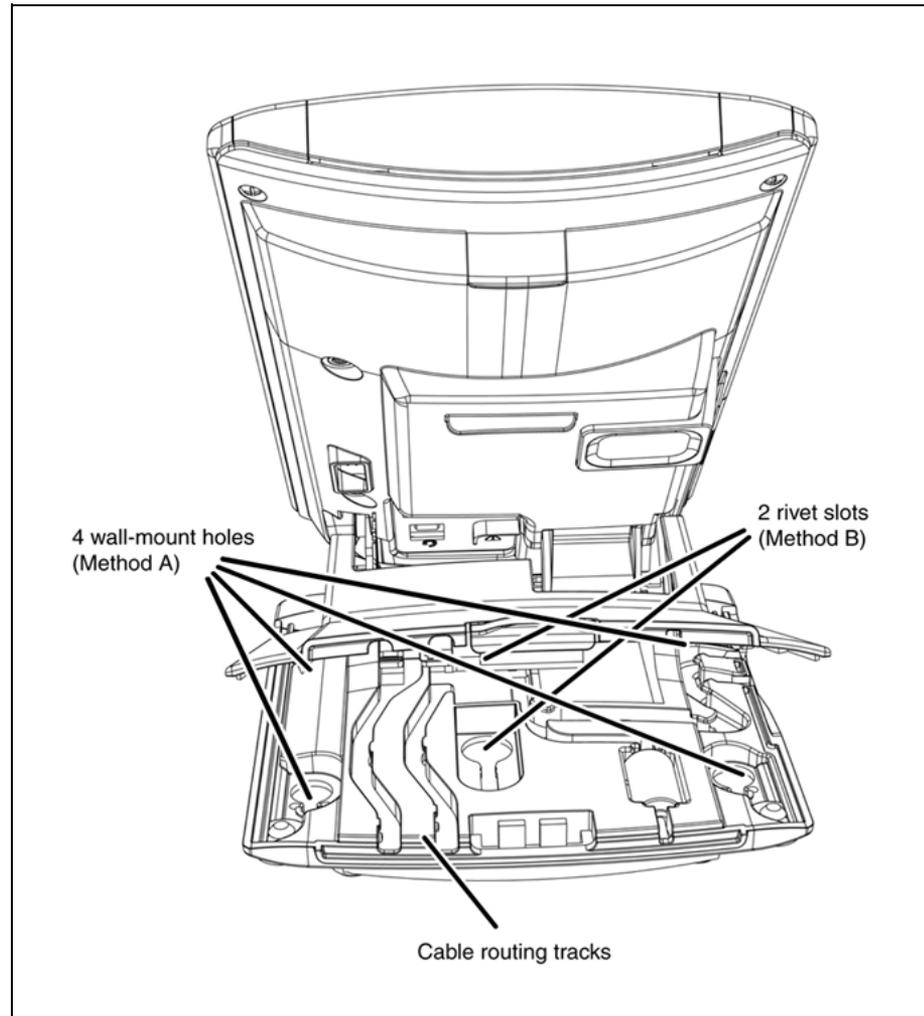
Figure 48
IP Phone 1150E connections



- 3 Install the headset. If you are installing a headset, plug the connector into the RJ-9 headset jack, and thread the headset cord along with the handset cord through the channels in the stand, so that the headset cord exits the channel.

Although a handset cord channel appears on the base of the IP Phone 1150E, the IP Phone 1150E does not support a handset port.

Figure 49
Cable routing tracks



- 4** Install the Ethernet cable. Connect one end of the supplied Ethernet cable to the back of your phone using the CAT5 connector (LAN Ethernet port), and thread the network cable through the channel.
- 5** If you are connecting your PC through the phone, a second CAT5 cable is required. Only one cable is included with the IP Phone 1150E package. Install the Ethernet cable connecting the PC to the phone (optional). Connect one end of the PC Ethernet cable to your phone using the CAT5 connector (PC Ethernet port) and thread it through the channel. Connect the other end to the LAN connector on the back of your PC.

**CAUTION****Damage to Equipment**

Do not plug any device into your IP Phone 1150E Ethernet port other than a PC. The IP Phone 1150E does not support multiple devices connected through the PC Ethernet port.

- 6 Connect additional cables. If applicable, plug in optional USB devices. Connect the Ethernet cable to the LAN Ethernet connection. If you are using an AC power adapter, plug the adapter into an AC outlet.

Complete steps 1 to 6, as needed, before wall-mounting the IP Phone.

- 7 Wall-mount your phone (optional). Use Method A or Method B to wall-mount the IP Phone. See Method A—using the mounting holes on the bottom of the phone stand, or Method B—using the traditional-style wall-mount box with a CAT5 connector and a 15 cm (6 inch) CAT5 cord (not provided).

- Method A: Press the wall-mount lever, and pull away from the stand. Using the stand cover (see [Procedure 80 "Remove the stand cover" \(page 392\)](#)), mark the wall-mount holes by pressing the bottom of the stand cover firmly against the wall in the location where you wish to install the phone. Four small pins on the bottom of the stand cover make the marks on the wall. Use the marks as a guideline to install the wall-mount screws (not provided). See [Figure 49 "Cable routing tracks" \(page 395\)](#).

Install the screws so that they protrude 3 mm (1/8 inch) from the wall, and then install the phone stand mounting holes over the screw heads. You may need to remove the phone from the wall to adjust the lower screws. When the lower screws are snug, install the phone on the mounting screws, and then tighten the top screws.

- Method B: Attach the 15 cm (6 inch) CAT5 cable, position the stand over the mounting rivets, and slide the phone down the wall so that the rivets fit into the slots on the stand. See [Figure 49 "Cable routing tracks" \(page 395\)](#).
- 8 Replace the stand cover. Ensure that all cables are neatly routed and press the stand cover into place until you hear a click.
 - 9 If you wall-mount the phone, put it in the wall-mount position by holding the tilt lever and press the phone towards the base until the phone is parallel with the base. Release the tilt lever and continue to push the phone towards the base until you hear a click. Ensure the phone is securely locked in to position.

—End—

Startup sequence

When an IP Phone 1150E connects to the network, it must perform a startup sequence. The elements of the startup sequence include

- obtaining VLAN ID (if supported by the network infrastructure)
- obtaining the IP parameters
- connecting to the Call Server
- obtaining a User ID

See [Table 58 "IP Phone 1150E IP parameters" \(page 397\)](#) for a summary of the IP parameters and how they are obtained.

Table 58
IP Phone 1150E IP parameters

Parameter	Method of acquisition
VLAN ID	Manually entered or automatically obtained through DHCP, and LLDP.
IP Address	Manually entered or automatically obtained through Partial or Full DHCP.
Net Mask	Manually entered or automatically obtained through Partial or Full DHCP.
Default Gateway address	Manually entered or automatically obtained through Partial or Full DHCP.
Connect Server (IP address, port, action and retry count—primary and secondary)	Manually entered or automatically obtained through Full DHCP.
User ID (Node ID, Node Password and TN)	Manually entered for first-time configuration. Obtained from local storage on subsequent power cycles.

Installing the IP Phone 1150E

To install the IP Phone 1150E, use [Procedure 81 "Installing the IP Phone 1150E " \(page 398\)](#).

ATTENTION**Timing information**

There are approximately 45 seconds between plugging in the IP Phone 1150E power adapter and the appearance of the text Nortel. When you see the text Nortel on the phone, you have 1 second to respond by pressing the four soft keys at the bottom of the display in sequence from left to right, one at a time. If you miss the 1-second response time, the IP Phone 1150E attempts to locate the connect server. You can begin the power-up sequence again, or you can double-press the Services key to open the Local diagnostic utilities to access the IP Phone settings. See [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

If you are prompted to enter a password when you double-press the Services key, password protection is enabled. For more information about password protection, see ["Local Tools menu password protection" \(page 385\)](#)

Procedure 81**Installing the IP Phone 1150E****Step Action**

- 1 When the Nortel logo appears in the middle of the display, immediately press the four soft keys at the bottom of the display in sequence from left to right. The **3. Network Configuration** menu opens.

You can press the **Apply&Reset** soft key to save the following settings and to reset the IP Phone. You can press the **Exit** soft key exit the menu to exit the menu without saving any changes and return to the **3. Network Configuration** menu.

When the **3. Network Configuration** menu opens, the **Enable 802.1x (EAP)** check box is highlighted.
- 2 Press the **Enter** key to switch this item on and off. A check mark appears to indicate the item is active.

If 802.1x Authentication is enabled, press the **Enter** key to start the edit mode. Use the dialpad to fill in the following information
 - Device ID
 - Password
 - Retype password
For further information about 802.1x Authentication, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

If you do not enable 802.1x Authentication, you are not prompted to enter Device ID and Password.
- 3 Use the **Right** navigation key to scroll and highlight **Enable 802.1x (LLDP Enable)**. check box.

For information about 802.1x Authentication, see [Appendix "802.1ab Link Layer Discovery Protocol"](#) (page 453).

- 4 Use the **Right** navigation key to scroll and highlight **DHCP** list.
- 5 Press the **Enter** key.
- 6 Press the **Down** navigation key to open list box.
- 7 Use the **Up/Down** navigation keys to scroll and highlight one of the following DHCP options
 - No—disable DHCP support and enter IP network information manually.
 - Partial—IP network information (IP address, network mask, and gateway address) are provided by the DHCP server. Enter Server 1 IP address, Server 2 IP address, Port, Action, Retry, and PK numbers manually.
 - Full—IP network information, Server 1 IP address, Server 2 IP address, and XAS information are provided by the DHCP server. All items are dimmed to prevent manual entry.

A DHCP server and DHCP relay agents must also be installed, configured, and running if you choose Partial DHCP, or Full DHCP configuration.

For more information about how to set up DHCP servers for use with the IP Phones, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

- 8 Press the **Enter** key.
- 9 Use the **Right** navigation key to scroll and highlight **SET IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Set IP—a valid IP Phone 1150E IP address
- 10 Use the **Right** navigation key to scroll and highlight **NET MASK**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Net Mask—a subnet mask
- 11 Use the **Right** navigation key to scroll and highlight **Gateway**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:
Gateway—the default gateway for the IP Phone 1150E on the LAN segment to which it connects

- 12** Use the **Right** navigation key to scroll and highlight **S1 IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information:

S1 IP—the primary CS 1000 node IP address for the IP Phone 1150E

- 13** Use the **Right** navigation key to scroll and highlight **Port**.

S1 Port—a fixed value of 4100

- 14** Use the **Right** navigation key to scroll and highlight **S1 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following

- for TPS only, enter 1
- for TPS and Secure Media Controller, enter 6 or 1

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

- 15** Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.

Retry—the number of times the IP Phone 1150E attempts to connect to the server

- 16** Use the **Right** navigation key to scroll and highlight **S1 PK**.

S1 PK—the Private key of the Secure Media Controller to which the IP Phone connects

- 17** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Enter 6 or 1.

For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.

- 18** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffffffffffff.

- 19** Use the **Right** navigation key to scroll and highlight **S2 IP**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.

S2 IP—the secondary CS 1000 node IP address for the IP Phone 1150E

The IP Phone 1150E can support a primary (S1) and secondary (S1) connect server. If you require IP Phones to register on multiple nodes, see *IP Line Fundamentals (NN43100-500)*

- 20** Use the **Right** navigation key to scroll and highlight **Port**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.
- Port—same as S1 port
- 21** Use the **Right** navigation key to scroll and highlight **S2 Action**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Choose one of the following
- for TPS only, enter 1
 - for TPS and Secure Media Controller, enter 6 or 1
- For more information about Secure Media Controller, see *Secure Multimedia Controller Implementation Guide (NN43001-325)*.
- 22** Use the **Right** navigation key to scroll and highlight **Retry**. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.
- Retry—same as S1
- 23** Use the **Right** navigation key to scroll and highlight **S2 PK**.
- S2 PK—the Private key of the alternate Secure Media Controller to which the IP Phone connects
- 24** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. Set the S2 PK to 6 or 1.
- 25** Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information. You must enter a 16-digit hexadecimal number. The default is ffffffffffffffff.
- 26** Use the **Right** navigation key to scroll and highlight **Ntwk Port Speed** box. Press the **Down** navigation key to open the list box. Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Link speed is autonegotiated with the network device
 - 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the network
 - 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the network

- 27** Use the **Right** navigation key to scroll and highlight **Ntwk Port Duplex** box. Press the **Down** navigation key to open the list box.
- The **Ntwk Port Duplex** option appears dimmed if **Ntwk Port Speed** is set to Auto.
- Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Duplex mode is autonegotiated with the network
 - Force Full—Duplex mode is forced to Full Duplex on the network
 - Force Half—Duplex mode is forced to Half Duplex on the network
- 28** Use the **Right** navigation key to scroll and highlight **Disable Voice 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 29** Use the **Right** navigation key to scroll and highlight **VoiceVLAN** box. Press the **Down** navigation key to open the list box.
- 30** Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- No VLAN
 - DHCP—VLAN ID is configured automatically to one of the values received from the DHCP server
 - LLDP MED—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
 - Manual
- If LLDP is disabled, LLDP MED and LLDP VLAN Name modes do not appear in the list. If DHCP is disabled, DHCP does not appear in the list.
- 31** Use the **Right** navigation key to scroll and highlight **VLAN Filter** check box.
- VLAN Filter** appears dimmed if **Disable Voice 802.1Q** check box is selected.
- If the VLAN Filter is enabled, packets destined for the IP Phone port are filtered on their MAC address and their VLAN tag. Untagged VLAN packets and tagged VLAN packets that differ from the Telephony VLAN ID are prevented from reaching the IP Phone port.
- For information about VLAN tagging, [Appendix "802.1Q VLAN description" \(page 443\)](#).

- 32 Use the **Right** navigation key to scroll and highlight **Ctrl Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **11**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- Ctrl Priority Bits** option appears dimmed if **Disable Voice 802.1Q** check box is selected.
- 33 Use the **Right** navigation key to scroll and highlight **Media Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **11**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- Media Priority Bits** option appears dimmed if **Disable Voice 802.1Q** check box is selected.
- 34 Use the **Right** navigation key to scroll and highlight **Disable PC Port** check box. Press the **Enter** key to switch this item on and off.
- 35 Use the **Right** navigation key to scroll and highlight **PC Port Speed** box. Press the **Down** navigation key to open the list box.
- Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Link speed is autonegotiated with the attached PC
 - 10BT Full—Link speed is available for up to 10 Megabit Full Duplex on the PC port.
 - 100BT Full—Link speed is available for up to 100 Megabit Full Duplex on the PC port.
- 36 Use the **Right** navigation key to scroll and highlight **PC Port Duplex** box. Press the **Down** navigation key to open the list box. Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—Duplex mode is autonegotiated with the attached PC
 - Force Full—Duplex mode is forced to Full Duplex on the PC
 - Force Half—Duplex mode is forced to Half Duplex on the PC
- PC Port Duplex** appears dimmed if the **PC Port Speed** option is set to Auto.
- 37 Use the **Right** navigation key to scroll and highlight **Disable Data 802.1Q** check box. Press the **Enter** key to switch this item on and off.
- 38 Use the **Right** navigation key to scroll and highlight **DataVLAN** box. Press the **Down** navigation key to open the list box.
- The **DataVLAN** option appears dimmed if **Disable Data 802.1Q** check box is selected.

Use the **Up/Down** navigation keys to scroll and highlight one of the following options

- No VLAN
- LLDP VLAN Name—VLAN ID is configured automatically to the value received from 802.1ab LLDP
- VLAN ID value—manual selection of VLAN ID from 1 to 4094

If LLDP is disabled, LLDP VLAN Name does not appear in the list.

- 39** Press the **Enter** key.
- 40** Use the **Right** navigation key to scroll and highlight **Data Priority Bits** box. Press the **Down** navigation key to open the list box. Select **Auto** (default), **1**, **2**, **3**, **4**, **5**, **6**, or **7** from the list.
- 41** Use the **Right** navigation key to scroll and highlight **PC-Port Untag All** check box. Press the **Enter** key to switch this item on and off.
- The PC-Port Untag All** option appears dimmed if **Disable Data 802.1Q** check box is selected.
- 42** Use the **Right** navigation key to scroll and highlight **Cached IP** check box. Press the **Enter** key to switch this item on and off.
- 43** Use the **Right** navigation key to scroll and highlight the **Enable PSK SRTP** check box. Press the **Enter** key to switch this item on and off.
- The SRTP media encryption feature provides encrypted media. A preshared secret is embedded in the Nortel IP Phone to generate and to exchange encryption parameters without any Call Server involvement.
- For further information about the SRTP media encryption feature, ["SRTP media encryption" \(page 429\)](#).
- 44** Use the **Right** navigation key to scroll and highlight **Ignore GARP** check box. Press the **Enter** key to switch this item on and off.
- The GARP feature protects the IP Phone from a Gratuitous ARP Spoof attack from the network.
- For more information about GARP, see ["Gratuitous Address Resolution Protocol Protection" \(page 408\)](#).
- 45** If an External Application Server (XAS) is available in the network, use the **Right** navigation key to scroll and highlight the **XAS IP** list. Use the dialpad to enter the XAS IP address.

The XAS delivers business applications to the IP Phone. For more information about XAS, see Nortel Application Gateway 1000 documentation.

- 46 If the XAS supports graphical displays, use the **Right** navigation key to scroll and highlight **Graphical XAS** check box. Press the **Enter** key to switch this item on and off.
- 47 Use the **Right** navigation key to scroll and highlight **Port** list. Press the **Enter** key to start the edit mode. Use the dialpad to fill in the information.
- 48 Use the **Right** navigation key to scroll and highlight **Enable Bluetooth** list. Press the **Enter** key. Press the **Down** navigation key to open the list box.

Only the Agent port supports Bluetooth wireless technology.

- 49 Use the **Up/Down** navigation keys to scroll and highlight one of the following options
- Auto—(default) Bluetooth wireless technology setting received through TFTP configuration
 - Yes—Bluetooth wireless technology is enabled on the IP Phone
 - No—Bluetooth wireless technology is disabled on the IP Phone

For further information about Bluetooth wireless technology, [Appendix "Bluetooth wireless technology" \(page 513\)](#).

- 50 Upgrade the IP Phone 1150E firmware.

Use the **Right** navigation key to scroll and highlight **TFTP IP** list. The IP Phone 1150E supports remote firmware upgrades through a TFTP process and an automated UFTP process.

The method to upgrade the firmware depends on the following Call Server software

- For Succession Release 3.0 or CS 1000 Release 4.0, the TFTP Server is required to download the current firmware. Enter the TFTP Server IP address at the prompt.
- For CS 1000 Release 4.5 and later, use either a TFTP Server to upgrade the firmware (at the prompt accept the default entry of 0.0.0.0) or UFTP to download the current firmware.

For further information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

For Succession Release 3.0 and CS 1000 Release 4.0, the IP Phone 2007 searches for the TFTP Server for firmware upgrade. If the file name specified in i2007.cfg is not the same as the current firmware, the IP Phone downloads the file and upgrades the firmware. This takes several minutes. When the upgrade is complete, the IP Phone 2007 reboots.

The Enhanced UNISlim firmware download is supported on CS 1000 Release 4.5 or later. The Enhanced UNISlim firmware download feature for IP Phones improves the delivery of new firmware to IP Phones. For further information about Enhanced UNISlim Firmware Download, see *IP Line Fundamentals (NN43100-500)*.

The IP Phone 1150E searches for the connect server.

- 51** The IP Phone 1150E registers with the Terminal Proxy Server (TPS) and, if needed, begins the firmware download. This takes several minutes. When download is complete, the IP Phone 1150E resets .

The current system date and time appear on the top line of the display when the configuration is complete. Self-labeling keys also appear.

- 52** Check for a dial tone and the correct DN on the display.

- 53** (Optional) Customize the feature keys as required. For more information, see *Software Input Output Administration (NN43001-611)* and the *IP Phone 1150E User Guide (NN43114-100)*.

—End—

Full Duplex mode

In the Configuration menu, autonegotiate mode is the default setting for initial startup. Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results. No intervention is required under normal operation.

Changing the speed and changing duplex mode on the phone changes both the LAN Ethernet port and PC Ethernet Port interfaces.

ATTENTION

Nortel recommends that autonegotiate mode is used on the network and the IP Phone. Use Full Duplex mode only when the network is forced Full Duplex for 100BT Full Duplex mode; otherwise, a duplex mismatch results.

If the IP Phone connects to a network configured for Full Duplex mode only, the IP Phone cannot automatically negotiate the proper configuration. Therefore, in this instance, to allow the IP Phone to work at the optimum speed and duplex mode, Full Duplex mode must be enabled.

Use [Procedure 82 "Enabling Full Duplex mode" \(page 407\)](#) to enable Full Duplex mode.

Procedure 82
Enabling Full Duplex mode

Step	Action
1	Double-press the Services key to open the Local Tools menu.
2	Press 3 on the dialpad to access the Network Configuration menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
3	Use the Right navigation key to scroll and highlight the Duplex list.
4	Press Enter to start the edit mode.
5	Press the Down navigation key to open list box.
6	Use the Up/Down navigation keys to scroll and highlight one of the following options <ul style="list-style-type: none"> • 10BT Full—10 BT Full Duplex mode • 100BT Full—100 BT Full Duplex mode
7	Press Enter to exit the edit mode.
8	Press the Apply&Reset soft key to save the changes and to restart the IP Phone 1150E. The firmware settings are read and are applied to UPLINK and the PC Ethernet Port.

—End—

When the IP Phone restarts, the firmware reads the setting for Full Duplex mode and sets the LAN Ethernet port, PC Ethernet port, duplex, and speed accordingly.

Use the following procedure to confirm activation of Full Duplex mode.

Procedure 83
Checking Ethernet Statistics

Step Action

- 1 Double-press the **Services** key to open the **Local Tools** menu.
- 2 Press **2** to select **Local Diagnostics**, then press **3** to open the **Ethernet Statistics** menu.

If Full Duplex mode is active, the following is displayed

- Link Status: UP
- Duplex Mode: Full
- Network Speed: 10 MB, 100 MB, or 1 G
- Auto Sense/Negotiate
 - Auto-Negotiate Capability: No
 - Auto-Negotiate Completed: No

—End—

TFTP firmware upgrade

When you enter the IP address of the TFTP Server, the IP Phone searches for an upgrade file on the TFTP Server.

Users of CS 1000 Release 4.5 or later do not need to enter a TFTP IP address.

For further information about TFTP firmware upgrade, see [Appendix "TFTP Server" \(page 529\)](#).

Gratuitous Address Resolution Protocol Protection

Gratuitous Address Resolution Protocol (GARP) Protection protects the IP Phone 1150E from GARP Spoof attacks on the network. In a GARP Spoof attack, a malicious device on the network takes over an IP address (usually the default gateway) by sending unsolicited (or Gratuitous) ARP messages, thus manipulating the ARP table of the victim machine. The malicious device launches a variety of attacks on the network, that results in undesired traffic routing. For example, a GARP attack can convince the victim machine that the malicious device is the default gateway. In this scenario, all traffic from the victim machine flows through the malicious device.

To enable GARP Protection during configuration, see [Procedure 81 "Installing the IP Phone 1150E " \(page 398\)](#).

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) is a general protocol that fulfills the protocol requirements defined by 802.1x. For further information about 802.1x, see [Appendix "802.1x Port-based network access control" \(page 451\)](#).

Bluetooth wireless technology

The IP Phone 1150E supports Bluetooth wireless technology . For information about configuring Bluetooth wireless technology on the IP Phone 1150E, see [Appendix "Bluetooth wireless technology" \(page 513\)](#).

Redeploying an IP Phone 1150E

You can redeploy an existing previously configured IP Phone 1150E on the same system. For example, the IP Phone 1150E can be assigned to a new user (new TN) or to an existing user who moved to a new subnet by changing the TN of the IP Phone 1150E. For further information, see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

Procedure 84

Changing the TN of an existing IP Phone 1150E

Step	Action						
1	<p>Repower the IP Phone 1150E.</p> <p>During the reboot sequence of a previously configured IP Phone, the IP Phone 1150E displays the existing node number for approximately five seconds.</p>						
2	<p>If the node password is enabled and NULL, choose one of the following</p> <ol style="list-style-type: none"> Disable the password. Set the password as non-NULL. 						
3	<p>Press OK when the node number displays.</p> <table border="0"> <thead> <tr> <th style="text-align: left;">If</th> <th style="text-align: left;">Then</th> </tr> </thead> <tbody> <tr> <td>the node password is enabled and is not NULL</td> <td>a password screen displays. Go to Step 4.</td> </tr> <tr> <td>the node password is disabled</td> <td>a TN screen displays. Go to Step 5.</td> </tr> </tbody> </table>	If	Then	the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .	the node password is disabled	a TN screen displays. Go to Step 5 .
If	Then						
the node password is enabled and is not NULL	a password screen displays. Go to Step 4 .						
the node password is disabled	a TN screen displays. Go to Step 5 .						
4	<p>Enter the password at the password screen, and press OK.</p> <p>A TN screen displays.</p>						

To obtain the password, enter the `nodePwdShow` command in Element Manager. For further information, see *Element Manager System Reference—Administration (NN43001-632)*.

- 5 Select the Clear soft key to clear the existing TN.
- 6 Enter the new TN.

—End—

Replacing an IP Phone 1150E

ATTENTION

Two IP Phones cannot share the same TN. You must remove the IP Phone 1150E that currently uses the TN.

Procedure 85

Replacing an IP Phone 1150E

Step	Action
1	Obtain the node and TN information of the phone you want to replace.
2	Disconnect the IP Phone 1150E that you want to replace.
3	Follow Procedure 80 "Configuring an IP Phone 1150E" (page 391) to install and configure the IP Phone 1150E.
4	Enter the same TN and Node Number as the IP Phone 1150E you replaced. The system associates the new IP Phone 1150E with the existing TN.

—End—

Removing an IP Phone 1150E from service

Procedure 86

Removing an IP Phone 1150E from service

Step	Action
1	Disconnect the IP Phone 1150E from the network or turn the power off.

The service to the PC is disconnected as well if the PC connects to the IP Phone 1150E.

If the IP Phone 1150E was automatically configured, the DHCP lease expires and the IP address returns to the available pool.

- 2 In LD 11, enter OUT at the TN prompt.

—End—

Expansion Module for IP Phone 1100 Series

Contents

This section contains the following topics:

- "Description" (page 413)
- "Features" (page 414)
- "Display characteristics" (page 415)
- "Package components" (page 415)
- "Configuration" (page 415)
- "Installation" (page 416)
- "Expansion Module startup initialization" (page 420)
- "Operating parameters" (page 421)
- "Services key operation" (page 422)
- "Firmware" (page 424)

Description

The Expansion Module for IP Phone 1100 Series (Expansion Module) is supported on the following IP Phones

- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

The Expansion Module is a hardware component that connects to the IP Phones and provides additional line appearances and feature keys.

Up to three Expansion Modules are supported on the IP Phones. With three Expansion Modules, the IP Phones provide up to 54 additional line/feature keys.

The IP Phone 1140E and IP Phone 1150E can also provide up to 36 additional line/feature keys using the Shift key functionality and one Expansion Module. With more than one Expansion Module connected, the Shift key functionality does not affect the Expansion Module since the maximum number of line/feature keys is already available.

The IP Phone 1120E does not support Shift key functionality.

Figure 50 "IP Phone 1140E with Expansion Module for IP Phone 1100 Series" (page 414) shows an IP Phone 1140E with the Expansion Module attached.

Figure 50
IP Phone 1140E with Expansion Module for IP Phone 1100 Series



Features

The Expansion Module provides the following features

- 18 self-labeled line/programmable feature keys provide up to 36 additional self-labeled line/programmable feature keys. Using the Shift key functionality, an IP Phone 1140E, for example, can have up to 66 additional logical self-labeled line/programmable feature keys.
- Upgradeable firmware using a TFTP or UFTP Server.
- A desk-mount bracket and structural baseplate connect the Expansion Module to an IP Phone or to another Expansion Module.

- IP Phone and Expansion Module combination can be wall-mounted using the wall mount template provided.

Display characteristics

The Expansion Module has the following display characteristics

- LCD display area—Each of the 18 physical keys on the Expansion Module has a 10-character display label beside the 18 self-labeled line/programmable feature keys (see [Figure 50 "IP Phone 1140E with Expansion Module for IP Phone 1100 Series" \(page 414\)](#)). This label is set automatically; however, the user can edit the label using the controls on the IP Phone.
- adjustable display and contrast settings—Use the Contrast Adjustment option in the Telephone Options menu on the IP Phone to adjust the display and contrast settings. Any contrast changes you make on the IP Phone affect the Expansion Module. The Expansion Module and IP Phone do not have separate contrast adjustments.
- backlight—The local 48 V power supply is required to operate the backlight on the Expansion Module; however, you can use either the local 48 V power supply or Power over Ethernet (PoE) to operate all other Expansion Module functionality.

Package components

[Table 59 "Expansion Module components list" \(page 415\)](#) lists the Expansion Module package components.

Table 59
Expansion Module components list

Expansion Module for IP Phone 1100 Series	NTYS08AAE6
---	------------

Configuration

Use LD 11 to configure the Expansion Module.

LD 11 - Configure the Expansion Module

Prompt	Response	Description
REQ:	NEW/CHG	Add new or change existing data.
TYPE	1120/1140/1150	For IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E
...
KEM	(0) - 3/<CR>	Number of attached Expansion Modules (0). Up to three Expansion Modules are supported.
...

Prompt	Response	Description
CLS	KEM3	KEM3 CLS must be defined
KEY	0 - <see text>/<CR>	Key number range expanded to support number of Expansion Modules specified by KEM prompt. The range on the IP Phone is as follows: KEM value: KEY range: 0 0 to 31 1 32 to 49 2 50 to 67 3 68 to 85
PAGEOFST	<Page> <KeyOff -set> / <CR>	PAGEOFST is prompted if one Expansion Modules is specified at the KEM prompt and <CR> is entered at the KEY prompt. This prompt enables you to enter a Page number of 0, or 1, and a Key Offset number from 0 to 17. Once entered, the KEY is prompted with the appropriate KEY value filled in. <CR> ends the input.
KEY <key>	<keys conf data>/ <CR>	<key> is the key number for the Page + Key Offset entered at PAGEOFST. Enter the key configuration <CR> or just <CR>.
KEMOFST	<KEM> <Key-Of f-set> / <CR>	KEMOFST is prompted if two or three Expansion Modules are specified at the KEM prompt and <CR> is entered for KEY prompt. This prompt enables you to enter a KEM number of 1, 2, or 3 and a KEY Offset number from 0 to 17. Once entered, the KEY prompt is prompted with the appropriate KEY value filled in. <CR> ends the input.
KEY <key>	<keys conf data>/ <CR>	<key> is the key number for the KEM + Key Offset entered at KEYOFST. Enter the key configuration <CR> or just <CR>.

Installation

The Expansion Module mounts on the right side of the IP Phone. The Expansion Module snaps into the receptacle on the back of the IP Phone using the desk-mount bracket and structural baseplate supplied with the Expansion Module.

The Expansion Module connects to the IP Phone using the Accessory Expansion Module (AEM) port on the IP Phone.

Use [Procedure 87 "Connecting the Expansion Module to the IP Phone" \(page 417\)](#) to connect the Expansion Module for IP Phone 1100 Series to the IP Phone.

**CAUTION****Damage to Equipment**

To avoid damaging the equipment, remove the power (PoE cable, or local power) from the IP Phone before connecting the Expansion Module.

**CAUTION**

The Expansion Module is shipped with the base locked in position. To avoid damaging the Expansion Module, press the wall-mount lever, located on the base at the front of the Expansion Module.

Procedure 87**Connecting the Expansion Module to the IP Phone****Step Action**

- 1 Press the tilt lever to adjust the stand angle on the IP Phone. See [Figure 51 "Wall-mount lever" \(page 417\)](#). You can adjust the stand angle to maximum, instead of removing the stand. See [Figure 52 "Adjusting the stand angle on the IP Phone" \(page 418\)](#).

Figure 51
Wall-mount lever

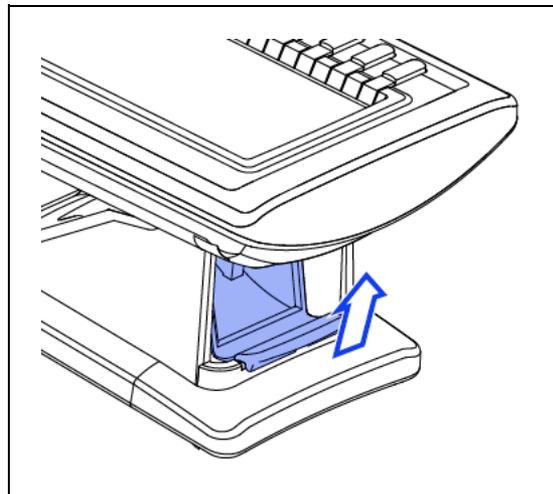
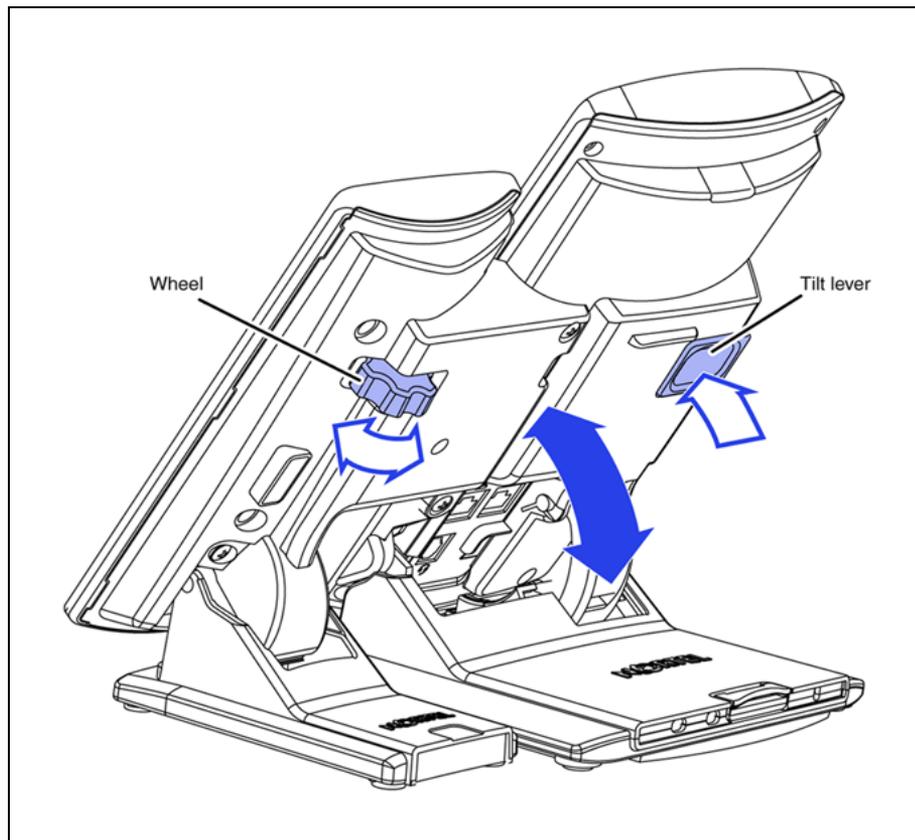
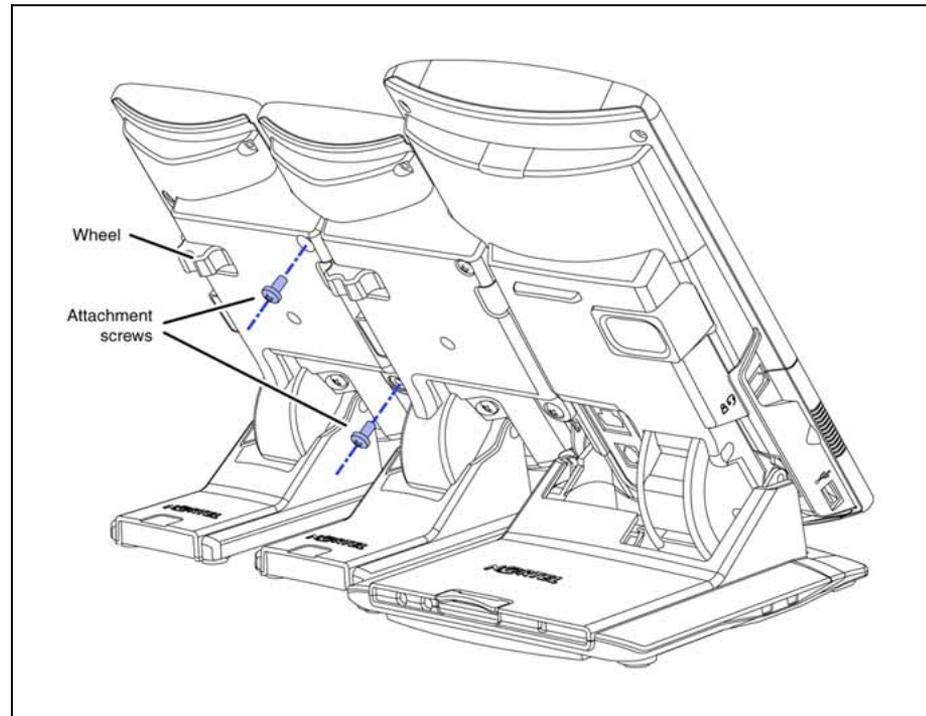


Figure 52
Adjusting the stand angle on the IP Phone



- 2 At the back of the IP Phone, remove the rubber plug from the Accessory Expansion Module (AEM) port. Place the connecting arm of the Expansion Module behind the IP Phone and align the Expansion Module connection plug to the AEM port on the back of the IP Phone.
- 3 Insert the screws in to the top and bottom holes of the connecting arm of the Expansion Module and tighten until snug. See [Figure 53 "Connecting the Expansion Module"](#) (page 419).

Figure 53
Connecting the Expansion Module



- 4 If connecting a second, or a third Expansion Module, repeat steps 2 to 4.

The second Expansion Module is attached to the right side of the first Expansion Module. The third Expansion Module is attached to the right side of the second Expansion Module.

- 5 Adjust the height of the IP Phone tilt adjustment to a comfortable viewing angle. Then adjust each of the Expansion Module footstands so they are flush to the desk surface. Turn the wheel on the back right side of the Expansion Module to the right (if viewed from the front) to tighten the Expansion Module.



CAUTION

Do not over tighten the wheel on the Expansion Module.

- 6 Connect power to the IP Phone. The Expansion Module powers up. The Expansion Module uses the electrical connection of the IP Phone for power. It does not have its own power source.

—End—

Expansion Module startup initialization

Once the Expansion Module has been installed and powered up on the IP Phone, the Expansion Module initializes.

Table 60 "Startup initialization process for the Expansion Module" (page 420) lists the initialization process for the Expansion Module.

Table 60
Startup initialization process for the Expansion Module

Phase	Description
1 Expansion Module performs self-test	<p>The self-test confirms the operation of the Expansion Modules local memory, CPU, and other circuitry. While undergoing this self-test, the Expansion Modules display lights up.</p> <p>If the Expansion Modules display does not light up, or lights up and then goes blank, or fails to begin flashing, check that the Expansion Modules is correctly installed and configured.</p>
2 Expansion Module establishes communication with the IP Phone	<p>The Expansion Modules display flashes until it establishes communication with the IP Phone.</p> <p>If the Expansion Modules display does not stop flashing, communication is not established with the IP Phone. Check that the Expansion Modules is correctly installed and configured.</p>
3 Expansion Module downloads key maps	<p>The key labels download to the Expansion Modules. During the download, the display is blank.</p>

When the three phases complete successfully, you are ready to use the additional self-labeled line/programmable feature keys on the Expansion Module.

If you have a second or a third Expansion Module installed on your IP Phone, the one to the immediate right of the IP Phone must be functional so that subsequent Expansion Module to work. This is necessary because the second Expansion Module receives its power, and communicates with the IP Phone, through the first Expansion Module; and the third Expansion Module receives its power, and communicates with the IP Phone, through the second Expansion Module.

Operating parameters

If the Expansion Module does not respond, and lines or features are configured on keys 32 to 85, calls can be directed to those keys which the user cannot access. This means that the IP Phone rings, but the call cannot be answered. In such cases, the incoming call receives Call Forward No Answer (CFNA) treatment.

IP Phone 1120E

The IP Phone 1120E does not support Shift key functionality.

If only one Expansion Module is configured in LD 11, but two or three Expansion Modules are detected on an IP Phone 1120E, the second and third Expansion Modules are ignored. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If two Expansion Modules are configured in LD 11, but only one Expansion Module responds, the keys on the second Expansion Module are available for call processing but are not accessible to the user. This means that lines and features on keys 32 to 67 can cause the IP Phone 1120E to ring, but there is no way to answer it. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If three Expansion Modules are configured in LD 11, but only one or two Expansion Modules respond, the keys on the third Expansion Module are available for call processing but are not accessible to the user. This means that lines and features on keys 68 to 85 can cause the IP Phone 1120E to ring, but there is no way to answer it. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

IP Phone 1140E and IP Phone 1150E

If only one Expansion Module is configured in LD 11, but two or three Expansion Modules are detected on the IP Phone, the Terminal Proxy Server (TPS) assigns keys 50 to 67 to the second Expansion Module. The third Expansion Module does not have keys assigned until it is configured in LD 11.

An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If two Expansion Modules are configured in LD 11 but only one Expansion Module responds, the TPS assigns keys 32 to 67 to the single Expansion Module (using the Shift key functionality). An error message displays to alert the administrator that the hardware configuration does not match the

administered configuration. When a second Expansion Module is detected, the TPS changes the key assignments to display across both Expansion Modules.

If two Expansion Modules are configured in LD 11 but three Expansion Module respond, the TPS assigns the keys 32 to 67 to the first two Expansion Modules. The third Expansion Module does not have keys assigned until it is configured in LD 11. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration.

If three Expansion Modules are configured but only one Expansion Module responds, the TPS assigns the keys 32 to 67 to the single Expansion Module (using the Shift key functionality). When a second Expansion Module is detected, the TPS changes the key assignments to display across both Expansion Modules. Keys on the third Expansion Module are inaccessible.

If three Expansion Modules are configured in LD 11 but two Expansion Modules respond, the TPS assigns keys 32 to 85 to the first two Expansion Modules. An error message displays to alert the administrator that the hardware configuration does not match the administered configuration. When a third Expansion Module is detected, the TPS changes the key assignments to display across all three Expansion Modules.

Services key operation

The Services key is used to access user settings and certain features on the IP Phone. When one or more Expansion Modules are attached to the IP Phone, the actions of the display diagnostics for the IP Phones DN/feature key display area are duplicated for the Expansion Modules.

If an incoming call occurs when in the diagnostic mode, the call is answered by pressing the DN/feature key, handsfree, or headset key, or by picking up the handset. The display area remains in diagnostic mode until either the user exits the diagnostic more, or the idle timeout clears the mode. Once cleared, the normal display for the current state of the IP Phone is displayed.

Press the Services key to access the following menu items

- Display diagnostics
- Set Info

Display diagnostics

Use the Up/Down navigation keys to scroll the Display diagnostics menu to access the following screens/diagnostic operations

- Initial screen
- Full Contrast

- LED Test
- Character Test

Initial screen

Instructions are displayed on the display area of the IP Phone and the Expansion Module. The DN/feature key display areas are blank.

Full Contrast

The IP Phone and the Expansion Module display areas are set to maximum (dark) contrast, including the DN/feature key areas. All LEDs are off.

LED Test

The IP Phone and the Expansion Module LEDs are set to on. The display area is cleared, including the DN/feature key display areas.

Character Test

The IP Phone and the Expansion Module LEDs are set to off. The available character set is displayed across all writable areas of the display, including the DN/feature key display areas. The telephone on-hook icon is displayed for all DN/feature keys.

Table 61 "Display diagnostic operation on the IP Phone and the Expansion Module for IP Phone 1100 Series" (page 423) shows the display diagnostic operation on the IP Phones and the Expansion Module.

Table 61
Display diagnostic operation on the IP Phone and the Expansion Module for IP Phone 1100 Series

Diagnostic step	IP Phone DN/feature key display area	Expansion Module display area
initial screen	blank	blank
Full Contrast	set to highest contrast	set to highest contrast
LED Test	blank	blank
Character Test	Characters display across the display areas, the telephone on-hook icon is displayed.	Characters display across the display areas, the telephone on-hook icon is displayed.

Set Info

The Set Info menu displays the firmware version for the IP Phone and any attached Expansion Modules. The attached Expansion Modules are identified as KEM1, KEM2, and KEM3. KEM1 is the closest to the IP Phone. The Expansion Module identifies the firmware as a three character string; the TPS displays the firmware in an n.nn format.

Use the Up/Down navigation keys to scroll the list to display the firmware for each attached Expansion Module. The firmware version is displayed even if the Expansion Module is not configured in LD 11. In this case, the Expansion Module is identified in the display area by an asterisk (*) after the Expansion Module number (for example, KEM1*).

If an Expansion Module is configured but does not respond, the firmware version displays as <unknown>.

Firmware

The Expansion Module uses a TFTP or UFTP Server to upgrade the firmware. The firmware is downloaded to the IP Phone, which is then distributed to the each attached Expansion Module, one at a time. After the Expansion Module confirms to the IP Phone that the firmware file is downloaded and saved successfully, the IP Phone starts the download to the next attached Expansion Module.

If any error causes the firmware download to fail, or if the saved firmware file is corrupted, the Expansion Module reverts to the factory installed firmware. The factory installed firmware file is always available to facilitate firmware download in case the downloaded firmware is unusable.

For more information about TFTP Server firmware upgrade, see [Appendix "TFTP Server" \(page 529\)](#).

For more information about Expansion Module, see the *Expansion Module for IP Phones 1100 Series User Guide (NN43130-101)*.

Features overview

Contents

This section contains the following topics:

- "Introduction" (page 425)
- "Corporate Directory" (page 426)
- "Personal Directory" (page 426)
- "Redial List" (page 426)
- "Callers List" (page 427)
- "Password Administration" (page 427)
- "IP Call Recording" (page 427)
- "Virtual Office" (page 427)
- "Emergency Services for Virtual Office" (page 428)
- "Active Call Failover" (page 428)
- "Enhanced UNISlim Firmware download" (page 428)
- "Media security" (page 429)
- "Live Dialpad" (page 433)

Introduction

This chapter provides an overview of the following software features available for IP Phones

- Corporate Directory
- Personal Directory
- Redial List
- Callers List
- Password Administration
- IP Call Recording
- Virtual Office

- Emergency Services for Virtual Office
- Active Call Failover
- Enhanced UNISlim Firmware download
- SRTP media encryption
- Live Dialpad

Personal Directory, Redial List, Callers List, Application Server Administration, Password Administration are software on the Signaling Server. An IP Phone must be registered to a Signaling Server to access these features.

Corporate Directory

The Corporate Directory feature extends the use of a system database, created from Telephony Manager 3.0 information, to the IP Phones. This database is downloaded and stored on the system CPU platform. For information about using Corporate Directory from IP Phones, see the appropriate user guide. For details about Corporate Directory, see *Features and Services Fundamentals—Book 2 of 6 (NN43001-106)*.

Corporate Directory is not supported on the IP Phone 2001, IP Audio Conference Phone 2033, or IP Phone 1110.

Personal Directory

Personal Directory allows an end user to create and control a personal directory. Up to 100 Personal Directory entries can be created, edited, copied from other sources, or deleted. (For information about using Personal Directory on IP Phones, see the appropriate user guide. For more information about the Personal Directory feature, see *Features and Services Fundamentals—Book 5 of 6 (NN43001-106)* . Personal Directory uses a separate central database, called the Application Server, to store directory data and end-user profile options.

Personal Directory is not supported on the IP Phone 2001, IP Audio Conference Phone 2033, or IP Phone 1110.

Redial List

Redial List is a call log feature whose content is generated by the system during call processing. The list resides on the Application Server. An end user can scroll through a list of up to 20 entries of the most recent calls dialed from the IP Phone and redial a selected telephone number. For more information about using Redial List with IP Phones, see the appropriate user guide. For more information about the Redial List feature, see *Features and Services Fundamentals—Book 5 of 6 (NN43001-106)*.

Redial List is not supported on the IP Phone 2001, IP Audio Conference Phone 2033, or IP Phone 1110.

Callers List

Callers List is a call log feature whose content is generated by the system during call processing. The list resides in the Application Server. An end user can scroll through a list of up to 100 entries of the most recent calls received by the IP Phone and call a selected telephone number. For more information about using Callers List with IP Phones, see the appropriate user guide. For more information about the Callers List feature, see *Features and Services Fundamentals—Book 5 of 6 (NN43001-106)*.

Callers List is not supported on the IP Phone 2001, IP Audio Conference Phone 2033, or IP Phone 1110.

Password Administration

Once the Station Control password (SCPW) has been set by the system administrator on the Call Server, end users can operate this feature from IP Phones to protect private directory information stored on the Application Server. For more information about using Password Administration from IP Phones, see the appropriate user guide. For information about the Password Administration feature, see *IP Line Fundamentals (NN43100-500)*.

IP Call Recording

IP Call Recording enables an IP Call Recording Server to monitor the media stream for the active call and record it by that provide the IP address and port information for an IP Phone on an active call. The following recording models are supported

- bulk call recording — records all calls on an IP Phone
- quality monitor recording — records individual calls on an IP Phone

If the network connection between the IP Call Recording Server and the IP Phone is lost, active calls cannot be recorded.

For more information about the IP Call Recording feature, see *IP Line Fundamentals (NN43100-500)* and *Automatic Call Distribution Fundamentals (NN43001-551)*.

Virtual Office

The Virtual Office feature enables end users to log into any IP Phone using their own user ID and password. This redirects the telephone calls and other features to the Virtual Office logged-in IP Phone. For information about using Virtual Office on an IP Phone, see the appropriate user guide. For

more information about the Virtual Office feature, see *IP Line Fundamentals (NN43100-500)* and *Features and Services Fundamentals—Book 4 of 6 (NN43001-106)*.

Emergency Services for Virtual Office

The E911 for Virtual Office feature allows Virtual Office users to place an emergency call to the correct Public Safety Answering Point (PSAP) for their geographic location. For more information about the E911 for Virtual Office feature, see *Emergency Service Access Fundamentals (NN43001-613)*.

Active Call Failover

The Active Call Failover (ACF) feature enables an IP Phone to reregister in the ACF mode during a Signaling Server failure.

The ACF mode preserves the following

- active media stream
- LED status of the Mute, Handsfree, and Headset keys
- DRAM content

All other elements (feature keys, soft keys and text areas) are retained until the user presses a key or the connection with the Signaling Server is resumed. If the user presses a key during the failover, the display is cleared and a localized "Server Unreachable" message is displayed.

The IP Phone uses this new mode of reregistration only when the Signaling Server explicitly tells the IP Phone to do so. IP Phones clear all call information if they register to a Signaling Server or Line Terminal Proxy Server (LTPS) that does not support the ACF feature.

For more information about Active Call Failover, see *IP Line Fundamentals (NN43100-500)*.

Enhanced UNiStim Firmware download

Enhanced UNiStim firmware download feature provides the following functionality for IP Phones

- Enhanced firmware file header that includes the IT_TYPE and name string for each IP Phone type.
- Revised definition of the IP Phone identification of the IP Phone Client.
- Maintenance Mode for the Signaling Server that allows more simultaneous firmware downloads.

Maintenance Mode is not applicable to Voice Media Gateway Cards.

- Identification of the registered IP Phones using string names and detailed identification of IP Phones that register as emulations of the base IP Phone 2001, IP Phone 2002, and IP Phone 2004.
- UNISlim IP Phones are able to register with older versions of firmware when the UFTP servers are busy, and are periodically offered the option start the firmware upgrade to the IP Phone.

Enhanced UNISlim Firmware download feature requires a Signaling Server to be present on the node. Without a Signaling Server, the only firmware files available for downloading are the three available in CS Release 4.0 for the Phase 0/1/2 IP Phone 2001, IP Phone 2002, and IP Phone 2004.

For further information about Enhanced UNISlim Firmware download, see *IP Line Fundamentals (NN43100-500)*.

Media security

Media security normally shares keys using a secure UNISlim channel. In situations where CS 1000 Release 5.0 or later is not available, you can use Pre-Shared keys (PSK).

For CS 1000 Release 5.0 and later, the controlling Call Server provides all of the keying material and control of the SRTP operation.

For CS 1000 Release 4.5 or earlier, the key is protected by a preshared secret embedded in the IP Phone to generate and exchange encryption parameters.

For more information about the Media Security feature, see *Security Management Fundamentals (NN43001-604)*.

The Media Security feature is supported on the following IP Phones:

- Phase II IP Phone 2001
- Phase II IP Phone 2002
- Phase II IP Phone 2004
- IP Phone 2007
- IP Phone 1110
- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

ATTENTION

Phase I IP Phones do not support SRTP.

Operating parameters

The Media Security feature has the following operating parameters

- During a firmware upgrade, the Media security is automatically disabled.
- Media security does not support duplicate media streams encryption, such as IP Call Recording.
- Pre-Shared key (PSK) SRTP media encryption negotiates after the call is setup. The first few seconds of the call can sometimes be unsecured; after the lock icon displays the call is secure. UNISTim key (USK) SRTP media encryption is negotiated before the call is setup so no delays occur. In both versions of SRTP, when the lock displays the call is secure.

When USK SRTP negotiates, an outlined lock icon and Encrypted appears on the display. When PSK SRTP negotiates, a solid lock icon displays but Encrypted does not display.

- SRTP PSK does not negotiate if you use 10ms G.729, due to the small payload size. The call remains in RTP. All other payloads are supported for PSK SRTP. USK SRTP supports all payloads.

Configuration

For CS 1000 Release 5.0 or later, you can configure a system-wide configuration setting (USK SRTP), which controls whether or not the CS 1000 system is capable of providing Media Security.

It is possible to enable both PSK SRTP on the IP Phone and configure USK SRTP at the Call Server. If USK SRTP does not negotiate for a call, PSK SRTP attempts to negotiate during a call. If the two endpoints for the call have PSK SRTP enabled, the call is encrypted using PSK SRTP.

By default, Media Security is enabled on the system. To configure USK SRTP, see "[USK SRTP configuration](#)" (page 430). To configure PSK SRTP on the IP Phone, see "[PSK SRTP configuration](#)" (page 431).

USK SRTP configuration

Use LD 17 to configure a system-wide Class of Service parameter for IP Phones called Media Security System Default (MSSD). The system default value is one of the following:

- Always Secure IP (MSAW)
- Best Effort (MSBT)
- Never (MSNV)

When you change the MSSD parameter, the system updates any IP Phones that have a Class of Service value of MSSD to use the new MSSD parameter.

Use LD 11 to configure the Media Security Class of Service on each IP Phone. The IP Phone can have any of the following values:

- MSSD
- Best Effort
- Always
- Never

For more information about configuring system-wide Media Security and configuring Class of Service, see *Security Management Fundamentals (NN43001-604)*.

PSK SRTP configuration

For CS 1000 Release 4.5 or earlier, you must configure PSK SRTP on each IP Phone. See "[PSK SRTP configuration](#)" (page 431).

To configure PSK SRTP on IP Phones, see the following procedures:

- Phase II IP Phone 2001, Phase II IP Phone 2002, Phase II IP Phone 2004, and IP Phone 1110—"[Enabling SRTP media encryption on a Phase II IP Phone and IP Phone 1110](#)" (page 431)
- IP Phone 2007—"[Enabling SRTP media encryption on an IP Phone 2007](#)" (page 432)
- IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E—"[Enabling SRTP media encryption on an IP Phone 1120E, IP Phone 1140E, or IP Phone 1150E](#)" (page 432)

Enabling SRTP media encryption on a Phase II IP Phone and IP Phone 1110

Step	Action
1	Disconnect then reconnect the power on the IP Phone to reset it.
2	When the Nortel logo appears, press each of the four soft keys at the bottom of the display in sequence from left to right, one at a time.
3	If no other configuration changes are required, press OK repeatedly until PSK SRTP (0-No, 1-Yes) option appears.
4	Press 1 to enable PSK SRTP.
5	Press OK .
6	Restart the IP Phone.

—End—

For more information about configuring an IP Phone, see the applicable section in this document.

Enabling SRTP media encryption on an IP Phone 2007

Step	Action
1	Tap the Tools icon.
2	Select Network Configuration .
3	Use the Right navigation key to scroll to Enable PSK SRTP . The current setting displays.
4	Select the check box to enable SRTP media encryption.
5	Tap the Apply&Reset soft key to apply the current configuration and reset the phone.

—End—

Enabling SRTP media encryption on an IP Phone 1120E, IP Phone 1140E, or IP Phone 1150E

Step	Action
1	Double-press the Services key.
2	Press 3 on the dialpad to access the Network Configuration menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
3	Press Enter to start the edit mode.
4	Use the Right navigation key to navigate to Enable PSK SRTP . The current setting displays.
5	Press Enter to switch this item on and off.
6	Press the Apply&Reset soft key to apply the current configuration and reset the phone.

—End—

Media Security information

Use the Encryption Info menu to view Media security information for the IP Phone. Select Telephone Options > Set Info > Encryption Info. The Encryption Info submenu offers the following choices:

- Encryption Capability—set to Available or Not Available depending on the IP Phone type and the firmware version
- Encryption Policy—set to Never, Best Effort, or Always, depending on configuration in LD 11

Live Dialpad

The primary Directory Number (DN) key is activated when the user makes a call by dialing a DN on the dialpad without picking up the handset or pressing the Handsfree key. To set the Live Dialpad feature to On or Off, select Telephone Options > Live Dialpad. By default, Live Dialpad is set to Off.

For more information about configuring Live Dialpad, see the applicable IP Phone User Guide.

Regulatory and safety information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver connects.
- Consult the dealer or an experienced radio/TV technician for help.

The user should not make changes or modifications not expressly approved by Nortel Networks. Any such changes could void the user authority to operate the equipment.

This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Warnings:

- This is a Class B product. In a domestic environment this product can cause radio interference in which case the user must take adequate measures.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス B 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。

Table 62 "EMC compliance" (page 436) lists EMC compliance for various jurisdictions.

Table 62
EMC compliance

Jurisdiction	Standard	Description
United States	FCC CFR 47 Part 15	Class B Emissions: FCC Rules for Radio Frequency Devices (see Notes 1 and 2)
Canada	ICES-003	Class B Emissions: Interference-Causing Equipment Standard: Digital Apparatus
Australia/New Zealand	AS/NZS 3548 CISPR 22	Class B Emissions: Information technology equipment - Radio disturbance
European Community	EN55022	Class B Emissions: Information technology equipment - Radio disturbance
	EN 55024	Information technology equipment - Immunity characteristics Limits and methods of measurement
	EN 61000-3-2	Limits for harmonic current emissions (equipment input current \leq 16 A per phase)
	EN 61000-3-3	Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current \leq 16 A
Japan	VCCI	Regulations for voluntary control measures.

Table 63 "Safety compliance" (page 436) lists safety compliance for various jurisdictions.

Table 63
Safety compliance

Jurisdiction	Standard	Description
United States	UL 60950-1	Safety of Information Technology Equipment
Canada	CSA 60950-1-03	Safety of Information Technology Equipment
European Community	EN 60950-1	ITE equipment - Safety - Part 1: General requirements
Australia/New Zealand	AS/NZS 60950.1:2003	Safety of Information Technology Equipment

Other Safety Approvals : IEC 60950-1: ITE equipment - Safety - Part 1: General requirements.

Other compliances

US/Canada—Hearing Aid Compatibility (HAC) as per FCC Part 68 This equipment complies with the CE Marking requirements.



EU Countries—This device complies with the essential requirements and other relevant provisions of Directive 1999/5/EC. A copy of the Declaration may be obtained from www.nortel.com or from the Nortel Networks GmbH address: Ingolstaedter Strasse 14-18, 80807 Munich Germany.

Australia: AS/ACIF S004—Voice Frequency Performance Requirements for Customer Equipment

For those devices equipped with Bluetooth wireless technology

This portable device with its antenna complies with FCC RF radiation exposure limits for an uncontrolled environment. To maintain compliance, this transmitter must not be colocated or operated in conjunction with any other antenna or transmitter.

DenAn regulatory notice for Japan

Warning

Please be careful of the following while installing the equipment:

- Please only use the Connecting cables, power cord, AC adaptors shipped with the equipment or specified by Nortel to be used with the equipment. If you use any other equipment, it may cause “failures, malfunctioning or fire”.
- Power cords shipped with this equipment must not be used with any other equipment. In case the above guidelines are not followed, it may lead to death or severe injury



本製品を安全にご使用頂くため、以下のことにご注意ください。

- 接続ケーブル、電源コード、ACアダプタなどの部品は、必ず製品に同梱されております。添付品または指定品をご使用ください。添付品・指定品以外の部品をご使用になると故障や動作不良、火災の原因となることがあります。
- 同梱されております付属の電源コードを他の機器には使用しないでください。上記注意事項を守らないと、死亡や大怪我など人身事故の原因となることがあります。

Appendix A

Specifications

Contents

This section contains the following topics:

- "IP Phone power requirements" (page 439)
- "Environmental specifications" (page 441)

IP Phone power requirements

Phase II IP Phones have integrated hardware to support power over Ethernet for 802.3af standard power. Nortel recommends Power over Ethernet deployment since it allows for power backup in case of power failures. With Phase II IP Phones, power splitters are no longer needed to support Power over Ethernet.

Phase II IP Phones, IP Phone 2007, IP Phone 1110, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E also support connection to AC local power using the appropriate adapter. If local power using the AC adapter is required, the AC adapter must be ordered separately. If the network LAN infrastructure supports Power over Ethernet, an AC adapter may not be required.

You must order a country-specific power adapter. See the IP Phone components list table in the applicable IP Phone chapter for AC adapter descriptions and product codes.

If you are using local power with the IP Phone 1110, IP Phone 1120E, IP Phone 1140E, or IP Phone 1150E, you must use the AC adapter (model number N0089601) *only*.

Nortel does not advise connecting a local power adapter in addition to Power over Ethernet.

Table 64 "Power requirements (US, CA, CALA, AP, GC) " (page 440) shows the power requirements for the IP Audio Conference Phone 2033 (US, CA, CALA, AP, GC) using Power over Ethernet Classification 0.

Table 65 "Power requirements (EMEA) " (page 440) shows the power requirements for the IP Audio Conference Phone 2033 (EMEA) using Power over Ethernet Classification 0.

In the following tables, heavy load is defined as all LEDs on and 1 kHz tone on the speaker and Normal load is defined as set powered up.

Table 64
Power requirements (US, CA, CALA, AP, GC)

IP Phone	Product Code	Maximum Load	Normal Load
2033	NTEX11BA70 NTEX11EA70	10.5 W	8.5 W

Table 65
Power requirements (EMEA)

IP Phone	Product Code	Maximum Load	Normal Load
2033	NTEX11AA70E6 NTEX11BA70E6 NTEX11EA70E6 NTEX11FA70E6	10.5 W	8.5 W

Table 66 "Power requirements for Phase II IP Phones using Power over Ethernet Classification 2" (page 440) provides power requirements using Power over Ethernet Classification 2.

Table 66
Power requirements for Phase II IP Phones using Power over Ethernet Classification 2

IP Phone	Product Code	Maximum Load	Normal Load
2001 (Phase II)	NTDU90BA	4.0 W	3.0 W
2002 (Phase II)	NTDU91BA	4.5 W	3.0 W
2004 (Phase II)	NTDU92BA	4.5 W	3.4 W
1110	NTYS02AAE6 NTYS02BAE6	4.5 W	3.4 W

Table 67 "Power requirements for IP Phones using Power over Ethernet Classification 3" (page 441) provides power requirements for the IP Phone 2007, IP Phone 1120E, and IP Phone 1140E using Power over Ethernet Classification 3.

Table 67
Power requirements for IP Phones using Power over Ethernet Classification 3

IP Phone	Product Code	Maximum Load	Normal Load
2007	NTDU96AB	10.0 W	7.0 W
1120E	NTYS03AA NTYS03BA	10.5 W	6.0 W
1140E	NTYS05AA NTYS05BA	10.5 W	6.0 W
1150E	NTYS06AA NTYS06BA NTYS15AAE6	10.5 W	6.0 W

Environmental specifications

Table 68 "Environmental specifications" (page 441) shows the environmental specifications of IP Phones.

Table 68
Environmental specifications

Parameter	Specifications
Operating temperature	+5° to +40°C, ambient
Operating humidity	+5% to 95% RH (29 g/m3 mean absolute humidity)
Storage temperature	-40° to +70° C

Appendix B

802.1Q VLAN description

Contents

This section contains the following topics:

- "Introduction" (page 443)
- "Description" (page 444)
- "IP Phone support" (page 444)
- "IP Softphone 2050 support" (page 445)
- "Three-port switch support" (page 445)
- "VLAN IDs" (page 446)
- "Enhanced DATA VLAN" (page 448)

Introduction

The 802.1Q support is available for the following IP Phones

- IP Phone 2001
- IP Phone 2002
- IP Phone 2004
- IP Phone 2007
- IP Audio Conference Phone 2033
- IP Softphone 2050 (through the PC operating system)
- IP Phone 1110
- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

The 802.1Q support is configured from the user display interface of the IP Phone. Configure 802.1Q VLAN support when you initially configure an IP Phone. The switch ports for Voice Gateway Media Card TLAN network interfaces must be configured as untagged ports so the header is removed. While the IP Phone 2001 and the IP Audio Conference Phone 2033 provide VLAN support, they do not provide a port for a PC.

The 802.1Q IEEE protocol standard allows virtual LANs (VLANs) to be defined within a single LAN. This improves bandwidth management and limits the impact of broadcast and multicast messages. A higher level of security between segments in a network can also be achieved.

802.1Q functionality is supported only on the IP Phone. The IP Line application IP stack does not provide 802.1Q support for the Voice Gateway Media Card.

Description

The p bits within the 802.1Q standard allow packet prioritization at Layer 2 improving network throughput for VoIP data.

The 802.1Q standard specifies a new format of Ethernet frame. A standard Ethernet frame contains

- a header consisting of a six-byte destination MAC address (following the header is a data area)
- a six-byte source MAC address
- a two-byte protocol identifier

The 802.1Q formatted frame is identical to a standard Ethernet frame, with the exception of the 4-byte 802.1Q tag that is inserted between the source MAC address and the protocol identifier. The first 16 bits of the 802.1Q tag field is the Tag Protocol Identifier containing 8100 (hex), allowing the Ethernet interface to distinguish it from standard Ethernet frames. The last 16 bits of the 802.1Q tag contain the following information

- a 3-bit Priority field (the 802.1p defined bits)
- a 1-bit Canonical Field Identifier (CFI)
- a 12-bit VLAN ID field

IP Phone support

The IP Phones support 802.1Q as follows

- 802.1Q can be enabled or disabled at boot time using manual configuration or control downloaded from the TPS.
- If 802.1Q is disabled, standard Ethernet frames are transmitted.

- If 802.1Q is enabled, all frames transmitted by the Ethernet driver have the 802.1Q tag bytes inserted between the source MAC address and the protocol type field. The tag protocol identifier field contains 8100 (hex) and the CFI bit is set to 0.
- When 802.1Q is enabled, the configuration of separate voice and data VLANs is possible. Each VLAN has its own ID and priority on the IP Phone. Voice messages have the priority bits of all frames set to 6 (octal) and the VOICE VLAN ID is set to 000 (hex) by default. Data messages have the priority bits of all frames set to 0 and the DATA VLAN ID is set to 000 (hex) by default. The GUI and TPS configured values override these values.
- The IP Phone Ethernet driver receives any Ethernet frame destined for it, regardless of whether 802.1Q is enabled or whether the received frame is an 802.1Q tagged frame.

The only exception is any 802.1Q tagged frame with the CFI = 1. In this case the frame is discarded.
- The IP Phone Ethernet driver strips the 802.1Q tag information from the frame prior to passing it on to the IP stack.
- The IP Phone Ethernet driver filters packets by the VLAN tag and MAC address. Tagged traffic is prioritized and routed based on the priority bits.

IP Softphone 2050 support

The IP Softphone 2050 supports 802.1Q with Windows 2000. By default, when 802.1Q is enabled, the priority bits of all frames are set to 6 and the VLAN ID is set to 0 (a restriction of Windows 2000).

Three-port switch support

The section refers to the following IP Phones

- IP Phone 2002
- IP Phone 2004
- IP Phone 2007
- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

The three-port switch does not interpret the 802.1Q header, but rather, allows the packets to pass through unmodified. Priority is achieved on a per port basis. The phone "port" traffic has higher priority over the Ethernet port to which the PC connects.

An IP Phone can receive Broadcast frames from a PC data VLAN. Any data network broadcast storm packets from the network are seen by the IP Phone. Significant broadcast storms occurring on the DATA VLAN can impact IP Phone performance. See "[Enhanced VLAN Tagging](#)" (page 447) for configuration information to filter network activity from impacting IP Phone performance.

Enhanced 802.1P and 802.1Q support on the IP Phones improves voice quality by taking advantage of the VLAN filtering available on the three-port switch on the BCM 1100/1101/1103.

The following functions are available on the three-port switch

- hardware VLAN filter
- two TX (out) queues on each port —High Priority Queue (HPQ) and Low Priority Queue (LPQ)

Therefore, traffic other than Voice VLAN can be filtered by enabling the VLAN filtering feature and taking advantage of the hardware VLAN filter. Voice traffic is always queued to the HPQ thereby that provide a higher quality of service.

VLAN IDs

The VOICE and DATA VLAN ID fields can be specified on a *per interface* basis. There is only one network interface on the IP Phone; however, the IP Phone has two internal IDs, one for voice and one for data traffic. The IP Phone firmware can detect and route the voice and data traffic.

The VLAN ID fields are *global* settings. That is, all voice packets transmitted by the IP Phone have the same VOICE VLAN ID. If DATA VLAN is enabled, the IP Phone adds the DATA VLAN ID to untagged traffic. However, if the traffic arriving on the PC port is already tagged, the frame passes through unchanged.

Each VLAN ID is specified as follows

- The default VLAN ID is 000 (hex).
- The VOICE and DATA VLAN IDs can be specified in the manual configuration user interface.
- Or, in the case of the VOICE VLAN ID, the VOICE VLAN ID can also be configured by the DHCP parameter when using the Automatic VLAN discovery using DHCP approach.

Automatic VOICE VLAN ID configuration

As part of the 802.1Q feature, there is an option to automatically discover the VOICE VLAN ID using DHCP. This process reduces the configuration steps since entering data manually (the VOICE VLAN ID) is not required.

When the Automatic VOICE VLAN Discovery using DHCP approach is used, and the IP Phone has been configured as such, the following steps are automatically taken to obtain the VOICE VLAN ID

1. The IP Phones perform an initial DHCP Discovery Request in the default VLAN.
2. The DHCP server returns a DHCP Ack message with an IP address in the data VLAN and one or more voice VLAN IDs in the vendor-specific field.
3. The IP Phone reads and saves the VOICE VLAN IDs.
4. The IP Phone rejects the DHCP offer (accepts it but immediately gives up the lease).
5. The IP Phone reboots and sends a DHCP Discovery Request with the first VLAN ID from the saved list. This is repeated for each VLAN ID in the list until a response is received.

This works because the Layer 2 switch discards every DHCP Discovery Request it receives from the IP Phone if the VLAN ID does not match the VLAN IDs configured on the port. When the IP Phone sends a DHCP Discovery Request with the port configured VLAN ID, the packet passes into the network and the DHCP server Ack message is passed back.

When a DHCP Ack message is received, the IP Phone accepts the offer and saves the IP address and Node IP address.

Enhanced VLAN Tagging

Enhanced VLAN has two main functions

- Enhance the current Voice VLAN by implementing the hardware VLAN filter on the IP Phone port (SMP).
- Use TX High Priority Queue (HPQ) and 802.1P VLAN priority to enhance the traffic control on the IP Phone and PC network interface.

ATTENTION

VLAN filtering on the telephony port is disabled by default. If tagging is enabled on the telephony port, you can enable VLAN filtering on the telephony port. When VLAN filtering is enabled, packets destined for the IP Phone port are filtered based on the MAC address and the VLAN tag.

If VLAN filtering is not enabled on the telephony port, packets destined for the IP Phone port are filtered only on the MAC address. Filtering based on the VLAN tag does not occur. This makes the telephony port susceptible to broadcast storms and a Denial of Service (DOS) attack.

Enhanced DATA VLAN

Enhancements for DATA (PC Port) VLAN for the IP Phone include the following

- DATA (PC Port) VLAN packet handling
 - PC Port (Ingress direction)
 - PC Port (Egress direction)
- DATA (PC Port) VLAN Tag Stripping

DATA (PC Port) VLAN packet handling

Packets processed to and from the PC port operate as follows

PC Port (Ingress direction)

- DATA VLAN disabled—all traffic received on the PC port is switched based on MAC address. The packets are not modified in any way.
- DATA VLAN enabled—all untagged packets received on the PC port have the 802.1Q header appended and the VLAN ID is set to the value that was manually configured in the Data VLAN field. Any packet arriving on the PC port that is already tagged is dropped.

PC Port (Egress direction)

- DATA VLAN disabled—all traffic received on the PC port has the 802.1Q header appended and the VLAN ID is set to the value which was manually configured in the DATA VLAN field. Any packet arriving on the PC port which is already tagged is dropped.
- DATA VLAN enabled—all traffic is forwarded to the PC port based on a review of the MAC address and the 802.1Q value that was manually configured in the DATA VLAN field. Traffic is forwarded out the PC port only if the packets contain the DATA VLAN tag. Untagged traffic and traffic without the DATA VLAN tag is dropped.

DATA (PC Port) VLAN Tag Stripping

DATA VLAN Tag Stripping can be configured in the Network Configuration menu. To enable DATA VLAN Tag Stripping, select the PC-Port Untag All check box, DATA VLAN Tag Stripping can be enabled or disabled independent of enabling VLAN support on the PC Port.

If the DATA VLAN Tag Stripping is disabled, the packet is sent to the PC Port unmodified. If the DATA VLAN Tag Stripping is enabled, the 802.1Q header if one exists, is removed from the packet before the packet is forwarded to the PC port.

During manual configuration, if DATA VLAN is enabled by configuring a VLAN ID, the PC-Port Untag All check box is selected and is enabled by default. By default, the egress tag is stripped. To manually override this setting and disable egress stripping, clear the PC-Port Untag All check box.

If DATA VLAN is not enabled during manual configuration, the PC-Port Untag All check box is not selected. By default, the ingress tag is not stripped. To manually override this setting and enable ingress stripping, select the PC-Port Untag All check box.

Appendix C

802.1x Port-based network access control

Contents

This section contains the following topics:

- "Introduction" (page 451)
- "Extensible Authentication Protocol" (page 451)

Introduction

The 802.1x support is available for the following IP Phones

- IP Phone 2001
- IP Phone 2002
- IP Phone 2004
- IP Phone 2007
- IP Audio Conference Phone 2033
- IP Phone 1110
- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

Extensible Authentication Protocol

Extensible Authentication Protocol (EAP) supports multiple authentication methods, such as MD5, PEAP, TLS, and TTLS, and represents a technology framework that facilitates the adoption of Authentication, Authorization, and Accounting (AAA) schemes, such as Remote Authentication Dial In User Service (RADIUS). RADIUS is defined in RFC 2865.

802.1x defines the following three roles

- Supplicant—an IP Phone which requires access to the network to use network services.
- Authenticator—the network entry point to which the supplicant physically connects (typically a Layer 2/3 switch). The authenticator acts as the proxy between the supplicant and the authentication server. The authenticator controls access to the network based on the authentication status of the supplicant.
- Authentication server—performs authentication of the supplicant.

Authorization

If 802.1x is configured and the IP Phone is physically connected to the network, the IP Phone (supplicant) initiates 802.1x authentication by contacting the Layer 2/3 switch (authenticator). The IP Phone also initiates 802.1x authentication after the Ethernet connection (network interface only) is restored following a network link failure. However, if the phone resets, the IP Phone assumes the Layer 2 link has remained in service and is authenticated. The IP Phone fails to authorize if the DeviceID and the IP Phone passwords do not match the DeviceID and IP Phone password provisioned on the RADIUS Server. The Layer 2 switch (authenticator) locks out the IP Phone and network access is denied. If this happens during reauthorization, all IP Phone services are lost. The connected PC operates as normal.

For information about configuring EAP, see the applicable IP Phone section in this document.

Appendix D

802.1ab Link Layer Discovery Protocol

Contents

This section contains the following topics:

- "Introduction" (page 453)
- "Description" (page 453)

Introduction

802.1ab Link Layer Discovery Protocol is available for the following IP Phones

- IP Phone 2001
- IP Phone 2002
- IP Phone 2004
- IP Phone 2007
- IP Phone 1110
- IP Phone 1120E
- IP Phone 1140E
- IP Phone 1150E

Description

The IEEE 802.1ab Link Layer Discovery Protocol (LLDP) defines a standard method for Ethernet network devices, such as IP Phones, switches, and routers to exchange information about their capabilities with other devices and to store this information in a Management Information Base (MIB).

LLDP also enables the system administrator to view the entire network infrastructure.

The Telecommunications Industry Association (TIA) developed the Link Layer Discovery Protocol (LLDP)-Media Endpoint Discovery (LLDP-MED) extension of 802.1ab LLDP for VoIP networks, as defined by ANSI/TIA-1057.

This extension enables media devices such as IP Phones, IP media gateways, IP media servers, and IP media controllers to transmit and receive media related information.

LLDP provides the following functionality

- periodic transmission of advertisements containing device information
- device capabilities and media specific configuration information to neighbors in the same network
- implementation of behavioral requirements specified by LLDP-MED

The 802.1ab feature provides automatic configuration of the IP Phone network policy parameters, such as VLAN ID, as well as, automatic detection of misconfigurations, such as Duplex discrepancies.

The 802.1ab feature is enabled by default. However, you can disable the feature during manual configuration.

For information about 802.1ab configuration, see the applicable IP Phone section in this document.

Appendix E

Configuring the Local Tools menu

Contents

This section contains the following topics:

- "Introduction" (page 455)
- "Configuring the Local Tools options" (page 455)

Introduction

This section describes the Local Tools menu for the IP Phone 1110, IP Phone 1120E, IP Phone 1140E and the IP Phone 1150E.

For information about the IP Phone 2007 Local Tools menu, see [Figure 16 "IP Phone 2007"](#) (page 170).

Configuring the Local Tools options

Double press the **Services** key to access the Local Tools menu. To make a menu selection, you can press the number associated with the menu item (for example, press 21 to show the IP Set&DHCP Information menu) or you can use the navigation keys to scroll through the list of menu items.

For information about the Local Tools menu for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E see [Figure 54 "Local Tools menu options"](#) (page 456).

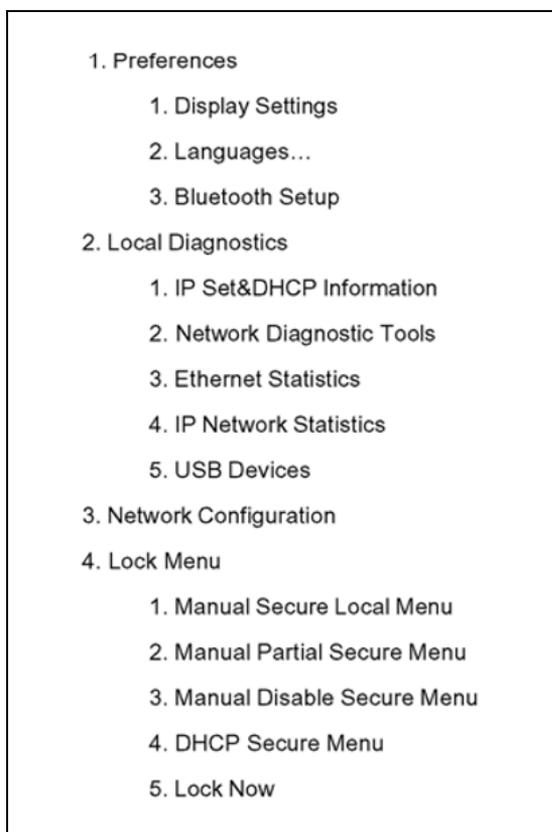
For information about the Local Tools menu for the IP Phone 1110, see [Figure 55 "IP Phone 1110 Local Tools menu"](#) (page 460).

[Figure 54 "Local Tools menu options"](#) (page 456) shows the options in the Local Tools menu.

Local Tools menu for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E

Figure 54 "Local Tools menu options" (page 456) shows the options in the Local Tools menu for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E.

Figure 54
Local Tools menu options



Bluetooth wireless technology (IP Phone 1140E, and IP Phone 1150E) is optional and is dimmed if it is not enabled.

Preferences

The Preferences submenu offers the following choices

- 1. Display Settings
- 2. Languages
- 3. Bluetooth Setup (IP Phone 1140E, and IP Phone 1150E)

1. Display Settings The Display Settings menu provides access to the Contrast and Screen Saver tools. Contrast adjusts the viewing angle of the display. Screen Saver controls how long the display remains lit if the phone is inactive.

Nortel recommends you use the Telephone Options menu to adjust the contrast.

2. Languages This item is used to select the language of the IP Phone.

3. Bluetooth Setup You can access the Bluetooth Setup options using either of the following two methods

- Double press the **Headset** key to open the 3. Bluetooth Setup dialog box.
- Double press the **Services** key to open the Local Tools menu, press 1 on the dialpad to select **1. Preferences** and press 3 on the dialpad to open the **3. Bluetooth** Setup dialog box.

The **3. Bluetooth Setup** item is not available on all phones. If the 3. Bluetooth Setup menu item appears dimmed, or fails to open when you double press the Headset key, Bluetooth wireless technology is not enabled on your phone. To configure the administration setting for Bluetooth wireless technology, see "[Bluetooth wireless technology](#)" (page 368).

Local Diagnostics

For information about Local Diagnostics for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E, see "[Local Diagnostics for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E](#)" (page 501).

Network Configuration

Use the Network Configuration menu item to configure the IP Phone 1120E IP Phone 1140E, and the IP Phone 1150E, and to display information which was configured during installation. You can access the Network Configuration menu using one of the following methods

- Reboot the IP Phone and press the four soft keys at the bottom of the display in sequence from left to right.
- Select 3. Network Configuration from the Local Tools menu.

For information about Network Configuration. see the following procedures

- [Procedure 66 "Installing the IP Phone 1120E" \(page 319\)](#) —IP Phone 1120E
- [Procedure 74 "Installing the IP Phone 1140E" \(page 357\)](#) —IP Phone 1140E

- [Procedure 81 "Installing the IP Phone 1150E " \(page 398\)](#) —IP Phone 1150E

Lock Menu

You must enter the fixed password whenever the Lock Menu sub menu is accessed. Use the dialpad and enter the fixed password 26567*738 (color*set).

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

The Lock Menu offers the following choices

- 1. Manual Secure Lock Menu
- 2. Manual Partial Secure Menu
- 3. Manual Disable Secure Menu
- 4. DHCP Secure Menu
- 5. LockNow

1. Manual Secure Local Menu When this option is selected, you are prompted to enter the fixed password whenever the **Services** key is double-pressed.

2. Manual Partial Secure Menu When this option is selected, you are prompted to enter the fixed password whenever you access the Local Diagnostics and the Network Configuration sub menus.

3. Manual Disable Secure Menu When this option is selected, the Lock Menu is disabled.

4. DHCP Secure Mode The IP Phone follows the menu lock configuration received from the Full DHCP string

- if SECUREMENU is present, you are prompted to enter a password after you double-press the Services key
- if PARTSECURE is present, you are prompted to enter a password whenever you select Local Diagnostics and Network Configuration
- if neither SECUREMENU nor PARTSECURE is present, then the menu is not locked

For information about Password Protection of the Local Tools menu in the applicable IP Phone section in this document.

5. Lock Now The Lock Now item immediately exits the Tools menu, closes any open Tools menu pages, and locks the **Tools** menu.

Procedure 88
Locking the Tools menu

Step Action

- 1 Press the Services key twice.
- 2 Press 4 on the dialpad to access the Lock Menu item or use the Up/Down navigation keys to scroll and highlight the Lock Menu options.
- 3 Press the Select soft key.

—End—

Procedure 89
Unlocking the Tools menu

Step Action

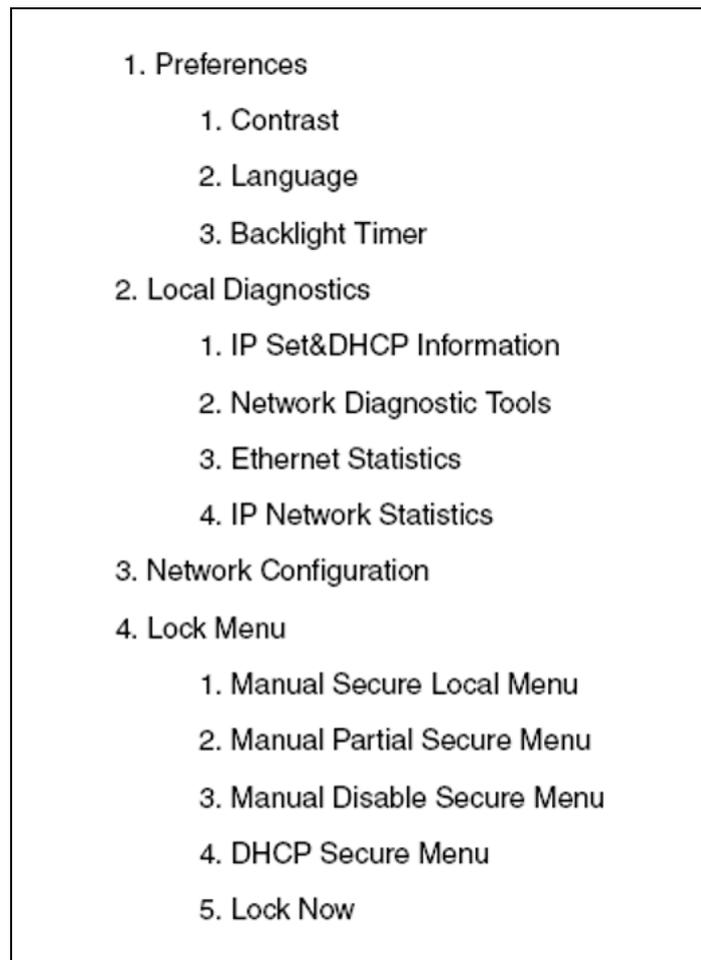
- 1 Press the Services key twice.
- 2 Enter the password 26567*738 (color*set) in the prompt window.
The Tools menu is unlocked, and remains active for five minutes.

—End—

Local Tools menu for the IP Phone 1110

[Figure 55 "IP Phone 1110 Local Tools menu"](#) (page 460) shows the Local Tools menu for the IP Phone 1110.

Figure 55
IP Phone 1110 Local Tools menu



Preferences

The Preferences submenu offers the following choices

- 1. Contrast
- 2. Language
- 3. Backlight Timer

1. Contrast The Contrast tool adjusts the contrast of the LCD display screen on the IP Phone 1110.

The initial Contrast level for the LCD display screen is downloaded when the IP Phone 1110 is configured. Selecting the Contrast tool automatically sets the LCD display screen contrast to the IP Phone local contrast setting.

2. Language Use this item to select the language in the local menus of the IP Phone. To access the language used by the server-based features, press Services > Telephone Options > Languages.

To access the local language tool, double-press the Services key, select the Preferences menu, or press 1 on the dialpad to open the Preferences menu, then press 2 to select the Language tool.

3. Backlight Timer Use this item to adjust how long the LCD display screen remains lit when the IP Phone 1110 is inactive.

The backlight time is displayed in the format xxx, where xxx is the time in minutes or hours.

Local Diagnostics

For information about Local Diagnostics for the IP Phone 1110, see [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

Network Configuration

Use the Network Configuration menu item to configure the IP Phone 1110 and to display information which was configured during installation. You can access the Network Configuration menu using one of the following methods

- Reboot the IP Phone and press the four soft keys at the bottom of the display in sequence from left to right.
- Select 3. Network Configuration from the Local Tools menu.

For information about Network Configuration, see [Appendix "IP Phone diagnostic utilities" \(page 465\)](#).

Lock Menu

You must enter the fixed password whenever the Lock Menu sub menu is accessed. Use the dialpad and enter the fixed password 26567*738 (color*set).

The settings configured in the Lock Menu sub menu override the settings received from the DHCP string.

The Lock Menu offers the following choices

- 1. Manual Secure Lock Menu
- 2. Manual Partial Secure Menu
- 3. Manual Disable Secure Menu
- 4. DHCP Secure Menu
- 5. LockNow

When options are inactive, a black box appears at the beginning of the menu item, and replaces the menu option number.

1. Manual Secure Local Menu When this option is selected, you are prompted to enter the fixed password whenever the Services key is double-pressed.

2. Manual Partial Secure Menu When this option is selected, you are prompted to enter the fixed password whenever you access the Local Diagnostics and the Network Configuration sub menus.

3. Manual Disable Secure Menu When this option is selected, the Lock Menu is disabled.

4. DHCP Secure Mode The IP Phone follows the menu lock configuration received from the Full DHCP string

- if SECUREMENU is present, you are prompted to enter a password after you double-press the Services key
- if PARTSECURE is present, you are prompted to enter a password whenever you select Local Diagnostics and Network Configuration
- if neither SECUREMENU nor PARTSECURE is present, then the menu is not locked

For information about Password Protection of the Local Tools menu in the applicable IP Phone section in this document.

5. Lock Now

The Lock Now item immediately exits the Tools menu, closes any open Tools menu pages, and locks the Tools menu.

Procedure 90

Locking the Tools menu

Step	Action
1	Press the Services key twice.
2	Press 4 on the dialpad to access the Lock Menu item or use the Up/Down navigation keys to scroll and highlight the Lock Menu options.
3	Press the Select soft key.

—End—

Procedure 91
Unlocking the Tools menu

Step Action

- 1 Press the Services key twice.
 - 2 Enter the password 26567*738 (color*set) in the prompt window.
 - 3 The Tools menu is unlocked, and remains active for five minutes.
-

—End—

Appendix F

IP Phone diagnostic utilities

Contents

This section contains the following topics:

- "Introduction" (page 465)
- "Text-based diagnostic utilities" (page 465)
- "Graphic-based diagnostics utilities" (page 495)

Introduction

Two methods of accessing IP Phone diagnostic utilities are text-based and graphic-based. The IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Audio Conference Phone 2033, and IP Phone 1110 use a text-based method to access diagnostic utilities. For information about diagnostic utilities for the IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Audio Conference Phone 2033, and IP Phone 1110, see "[Network diagnostic utilities](#)" (page 466).

The IP Phone 2007, IP Phone 1120E, IP Phone 1140E, and the IP Phone 1150E use a graphic-based method to access Local Diagnostics through the Local Tools menu. For information about Local Diagnostics for the IP Phone 2007, see "[Local Diagnostics for the IP Phone 2007](#)" (page 496). For information about Local Diagnostics for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E see "[Local Diagnostics for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E](#)" (page 501).

Text-based diagnostic utilities

Network diagnostic utilities are accessible on IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Audio Conference Phone 2033, and IP Phone 1110 to isolate voice quality and network performance problems.

Network diagnostic utilities

Network diagnostic utilities are available on the IP Phone itself (set-based), or from the Command Line Interface (CLI) (server-based). Diagnostic utilities provide testing and verification of end-to-end connectivity, verification of statistics and settings, and retrieval of set information. For further information about CLI, see ["Using CLI Commands"](#) (page 493).

Network diagnostic utilities include Network Diagnostic Tools (Ping and traceRoute), Ethernet Statistics, IP Networking Statistics, DHCP Information Process, RUDP Statistics, and Network QoS Process.

See [Table 69 "Network Diagnostic Utilities availability"](#) (page 466) for a description of diagnostic utilities available for each IP Phone state.

Network diagnostic utilities are available on the IP Audio Conference Phone 2033 in Remote Mode only.

For detailed information about Quality of Service (QoS) and Proactive Voice Quality Management (PVQM), see *Converging the Data Network with VoIP Fundamentals (NN43001-260)*.

[Table 69 "Network Diagnostic Utilities availability"](#) (page 466) lists the Network Diagnostic Utilities available on the IP Phone in different states.

Table 69
Network Diagnostic Utilities availability

Function module	Before IP Address assignment	After IP Address assignment, unregistered - Local Mode	Registered (TPS) - Remote Mode	Call in progress (TPS)
Local diagnostic tools (Ping & TraceRoute)	N/A	Yes	Yes	Yes
Ethernet statistics	Yes	Yes	Yes	Yes
IP Networking statistics	N/A	Yes	Yes	Yes
DHCP information process	N/A	Yes, part of information	Yes	Yes
UNISim/RUDP statistics	N/A	N/A	Yes	Yes
RTP/RTCP statistics	N/A	N/A	Yes	Yes

Function module	Before IP Address assignment	After IP Address assignment, unregistered - Local Mode	Registered (TPS) - Remote Mode	Call in progress (TPS)
Network QoS process	N/A	N/A	Yes, last call	Yes, renew
Supplicant Status	N/A	N/A	Yes	Yes
Supplicant Authentication Status	N/A	N/A	Yes	Yes
Supplicant Device ID	N/A	N/A	Yes	Yes
Supplicant Authenticator ID	N/A	N/A	Yes	Yes

Ping and TraceRoute

The system administrator can use the local diagnostic tools, Ping or Traceroute command, from a specific endpoint with any arbitrary destination, typically another endpoint or Signaling Server. Ping and TraceRoute are available in Local or Remote mode.

Ethernet statistics

In Local or Remote Mode, the system administrator can view ethernet statistics (for example, number of collisions, VLAN ID, speed and duplex) for the IP Phone on a particular endpoint. The exact statistics depends on what is available from the IP Phone for the specific endpoint. The user may select either the Network Port (Nlport) or PC port (PCport).

IP Networking statistics

In Local or Remote Mode, the system administrator can view information about the packets sent, packets received, broadcast packets received, multicast packets received, incoming packets discarded, and outgoing packets discarded.

DHCP information process

In Remote Mode, the system administrator can view DHCP settings (for example, IP address, S1, S2, and S4 addresses) for each IP Phone. In Local Mode partial information is available.

UNIStim/RUDP statistics

In Remote Mode, the system administrator can view RUDP statistics (for example, number of messages sent, received, retries, resets, and uptime) for the IP Phones.

RTP/RTCP statistics

In Remote Mode, the system administrator can view RTP/RTCP QoS metrics (for example, packet loss and jitter) while a call is in progress.

Network QoS Process

In Remote Mode, the system administrator can view QoS statistics (for example, packets sent, packets received, packet loss, jitter average and jitter maximum, and round trip delay).

Supplicant Status

The system administrator uses this option to determine whether 802.1x is enabled or disabled 802.1x.

Authentication State

The system administrator uses this option to determine whether the IP Phone is currently authenticated with the 802.1x system. The following are valid state values

- LogOff
- Disconnected
- Connected
- Acquired
- Authorizing
- Held
- Authorized
- Dbl Authd

DeviceID

The system administrator uses this option to check the user name configured for the device that is sent to the switch for authentication. This should match the corresponding entry in the RADIUS Server.

Authenticator ID

The system administrator uses this option to check the MAC address of the Authenticator (switch).

Accessing Network Diagnostic utilities from the IP Phone

Local diagnostics are available from the IP Phone for either Local or Remote mode.

Diagnostics prompts are presented in English.

Local Mode

When the IP Phone is not registered with the signaling server, the **Network Diagnostic Tools** menu is available from the IP Phone in Local Mode (see [Table 69 "Network Diagnostic Utilities availability" \(page 466\)](#)). This menu is controlled by the firmware on the IP phone.

Use [Procedure 92 "Accessing the Network Diagnostic Tools menu in Local mode"](#) (page 469) to access the Network Diagnostic Tools in Local mode.

Procedure 92

Accessing the Network Diagnostic Tools menu in Local mode

Step	Action
------	--------

- | | |
|---|---|
| 1 | Double-press the Services key. The Local Main Menu, Network Diagnostic Tools, appears. |
| 2 | Press Cancel to quit, or use the Navigation keys to scroll through the menu and select one of the following <ul style="list-style-type: none"> • Ping • TraceRoute • Ethernet Statistics • IP Network Statistics • IP Set & DHCP Information |

—End—

Procedure 93

Executing Ping

Step	Action
------	--------

- | | |
|---|---|
| 1 | Select Ping from the Network Diagnostic Tools submenu. |
| 2 | Press the IP soft key and enter the IP address to Ping.
Tip: Use the dialpad to enter the IP address. The * key is used for dots and the # key produces a space. |
| 3 | Press the Ping soft key. The results of the Ping appear on the display. |
| 4 | Use the Navigation keys to browse the data. See Figure 56 "PING data display page" (page 481).
Tip: Press the Ping soft key again to stop the pinging. |
| 5 | Press one of the following soft keys <ul style="list-style-type: none"> • Reset — to clear the data • Exit — to return to the Network Diagnostic Tools menu. |

—End—

Procedure 94
Executing TraceRoute

Step Action

- 1 Select **TraceRoute** from the **Network Diagnostic Tools** submenu.
- 2 Press the **IP** soft key and enter the IP address to trace.
- 3 Press the **Tracert** soft key. The results of the TraceRoute appear on the display.
- 4 Use the **Navigation** keys to browse the data. See [Figure 57 "TraceRoute data display screen"](#) (page 481).
Tip: Press the **Tracert** soft key again to stop the route tracing.
- 5 Press one of the following soft keys
 - **Reset** — to clear the data
 - **Exit** — to return to the **Network Diagnostic Tools** menu

—End—

Procedure 95
Accessing Ethernet Statistics

Step Action

- 1 Select **Ethernet Statistics** from the **Network Diagnostic Tools** menu. The Ethernet statistics appear on the display.
- 2 Use the **Navigation** keys to browse the data. See [Figure 58 "Ethernet Statistics data display page"](#) (page 482).
- 3 Press one of the following soft keys
 - **Reset**— to clear the data and reset the statistic counter
 - **Exit** — to return to the **Network Diagnostic Tools** menu

—End—

Procedure 96
Accessing IP Network Statistics

Step	Action
1	Select IP Network Statistics from the Network Diagnostic Tools menu. The IP Network Statistics appear on the display.
2	Use the Navigation keys to browse the data. See Figure 59 "IP Networking Statistics data display screen" (page 483) .
3	Press one of the following soft keys <ul style="list-style-type: none"> • Reset — to clear the data and reset the statistic counter • Exit — to return to the Network Diagnostic Tools menu

—End—

Procedure 97
Accessing IP Set and DHCP Information

Step	Action
1	Select IP Set & DHCP Information from the Network Diagnostic Tools menu. The IP Set and DHCP information appears on the display.
2	Use the Navigation keys to browse the data. See Figure 60 "DHCP information data display page" (page 484) . In Local Mode, Exit is the only soft-key available in this submenu.

—End—

Remote Mode

When the IP Phone is registered to the signaling server, diagnostics are available through the Telephone Options menu in Remote Mode. This menu is controlled by the TPS.

Diagnostics are available on the IP Audio Conference Phone 2033 in Remote Mode only.

When the user selects **Diagnostics** from the **Telephone Options** menu, if an IP Phone Installer Password is enabled in the Signaling Server, the **Diagnostics** menu is locked and the message "Access denied" displays on the IP Phone display.

Use Procedure 98 "Accessing the Diagnostics submenu in Remote Mode" (page 472) to access the **Diagnostics** submenu in Remote Mode:

Procedure 98

Accessing the Diagnostics submenu in Remote Mode

Step	Action
------	--------

- | | |
|---|--|
| 1 | Press the Services key. |
| 2 | Select Telephone Options . |
| 3 | Select Diagnostics . |
| 4 | Do one of the following: <ul style="list-style-type: none"> • Press the Cancel soft key to quit the Diagnostics submenu and return to the Telephone Options menu. • Use the Navigation keys to scroll through the Diagnostics submenu. • Press Select to select one of the diagnostics. |

The following items are available on the **Diagnostics** submenu

- Diag Tools (Diagnostic Tools: Ping and TraceRoute)
- EtherStats (Ethernet Statistics)
- IP Stats (IP Statistics)
- RUDP Stats (RUDP Statistics)
- QoS Stats (Quality of Service Statistics)

—End—

Procedure 99

Accessing Diagnostic Tools in Remote mode

Step	Action
------	--------

- | | |
|---|--|
| 1 | Select Diagnostic Tools from the Diagnostics submenu. |
| 2 | Do one of the following <ul style="list-style-type: none"> • Press the Cancel soft key to return to the Diagnostics submenu. • Use the Navigation keys to scroll to the Diagnostic Tools selection. |
| 3 | Press the Select soft key to choose one of the following |
-

- Ping (see Figure 63 "Ping data display page" (page 487))
- TraceRoute (see Figure 64 "Tracert data display screen" (page 487))

—End—

Ping The following items are available on the **Ping** submenu in Remote mode

- IP Addr
- Nr of Pings
- Ping!
- Last ping

Procedure 100

Entering an IP address

Step	Action
1	Scroll through the Ping submenu to the IP Addr menu item. An IP address appears if previously entered. Example 47.249.48.20.
2	Press the Select soft key.
3	Use the Navigation keys to scroll to the destination IP address. <ul style="list-style-type: none"> • If the destination IP address is in the list, press the Select soft key to select the IP address. Press the Select soft key again to return to the Ping submenu. • If the destination IP address is not in the list, continue scrolling through the available IP address list until the IP address 0.0.0.0 appears. Press the Select soft key. <p>Tip: To edit the IP address, use the dialpad and the Delete soft key and the Cancel soft key. Use the * key for dots.</p>
4	Press the Select soft key to save the new IP address or press the Cancel soft key to return to the Ping submenu.

—End—

Procedure 101**Changing the number of Pings**

Step Action

- 1 From the **Ping** submenu, use the **Navigation** keys to scroll to the **Nr of Pings** submenu item.
- 2 Press the **Select** soft key.
Tip: Use the **Delete** and **Clear** soft keys to enter the number of pings.
- 3 Do one of the following
 - Press the **Select** soft key to accept the change and return to the **Ping** submenu.
 - Press the **Cancel** soft key to return to the **Ping** submenu.

—End—

Procedure 102**Pinging an IP address**

Step Action

- 1 From the **Ping** submenu, use the **Navigation** keys to scroll to the **Ping!** submenu item.
- 2 Press the **Select** soft key. Pinging starts.
Tip: Press the **Stop** soft key to stop pinging.
- 3 Press the **OK** soft key to return to the **Ping** submenu.

—End—

Procedure 103**Reviewing the results of the Ping**

Step Action

- 1 Use the **Navigation** keys to scroll to the **Last Ping** submenu item.
- 2 Press the **Select** soft key.
- 3 Use the **Navigation** keys to scroll through the results.
- 4 Press the **Cancel** soft key to return to the **Ping** submenu.

—End—

TraceRoute The following items are available on the **TraceRoute** submenu in Remote mode

- IP Addr
- Max Nr of Hops
- TraceRt!
- Last TraceRt

Procedure 104

Entering an IP address

Step	Action
1	Scroll through the TraceRoute submenu to the IP Addr menu item. An IP address appears if previously entered. Example 47.249.48.20.
2	Press the Select soft key.
3	Use the Navigation keys to scroll to the destination IP address. <ul style="list-style-type: none"> • If the destination IP address is in the list, press the Select soft key to select the IP address. Press the Select soft key again to return to the TraceRoute submenu. • If the destination IP address is not in the list, continue scrolling through the available IP address list until the IP address 0.0.0.0 appears. Press the Select soft key. <p>Tip: To edit the IP address, use the Delete soft key and the Cancel soft key. Use the * key for dots.</p>
4	Press the Select soft key to save the new IP address, or press the Cancel soft key to return to the TraceRoute submenu.

—End—

Procedure 105

Changing the number of Hops

Step	Action
1	From the TraceRoute submenu, use the Navigation keys to scroll to the Max Nr of Hops submenu item.

- 2 Press the **Select** soft key.
Tip: Use the dialpad and the **Delete** and **Clear** soft keys to enter the number of Hops.
- 3 Do one of the following
 - Press the **Select** soft key to accept the change and return to the **TraceRoute** submenu.
 - Press the **Cancel** soft key to return to the **TraceRoute** submenu.

—End—

Procedure 106
Tracing a route

Step Action

- 1 From the **TraceRoute** submenu, use the **Navigation** keys to scroll to the **TraceRoute!** submenu item.
- 2 Press the **Select** soft key. Route tracing starts.
Tip: Press the **Stop** soft key to stop the trace.
- 3 Press the **OK** soft key to return to the **TraceRoute** submenu.

—End—

Procedure 107
Reviewing the results of the trace

Step Action

- 1 From the **TraceRoute** submenu, use the **Navigation** keys to scroll to the **Last TraceRt** submenu item.
- 2 Press the **Select** soft key.
- 3 Use the **Navigation** keys to scroll through the results.
- 4 Press the **Cancel** soft key to return to the **TraceRoute** submenu.

—End—

Ethernet Statistics Use [Procedure 108 "Browsing Ethernet Statistics" \(page 477\)](#) to access the **EtherStats** submenu item in Remote mode.

Procedure 108
Browsing Ethernet Statistics

Step	Action
1	Select EtherStats from the Diagnostics submenu. The Ethernet statistics appear on the display.
2	Do one of the following <ul style="list-style-type: none"> • Press the OK soft key to return to the Diagnostics submenu. • Use the Navigation keys to browse the data. See Figure 65 "Ethernet statistics data display screen" (page 488). • Press the Cancel soft key to return to the Diagnostics submenu.

—End—

Procedure 109
Checking 802.1x Supplicant status

Step	Action
1	Select EtherStats from the Diagnostics submenu.
2	Scroll through the EtherStats menu and select Supplicant Status .
3	Press the Select soft key.
4	Do one of the following <ul style="list-style-type: none"> • Press the OK soft key to return to the EtherStats submenu. • Use the Navigation keys to browse the data.
5	Press the Cancel soft key to return to the EtherStats submenu.

—End—

Procedure 110
Checking 802.1x Supplicant Authentication state

Step	Action
1	Select EtherStats from the Diagnostics submenu.
2	Scroll through the EtherStats menu and select Authentication State .

- 3 Press the **Select** soft key.
- 4 Do one of the following
- 5 Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.
- 6 Press the **Cancel** soft key to return to the **EtherStats** submenu.

—End—

Procedure 111
Checking Device ID

Step Action

- 1 Select **EtherStats** from the **Diagnostics** submenu.
- 2 Scroll through the **EtherStats** menu and select **Device ID**.
- 3 Press the **Select** soft key.
- 4 Do one of the following
 - Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.
- 5 Press the **Cancel** soft key to return to the **EtherStats** submenu.

—End—

Procedure 112
Checking Authenticator ID

Step Action

- 1 Select **EtherStats** from the **Diagnostics** submenu.
- 2 Scroll through the **EtherStats** menu and select **Authenticator ID**.
- 3 Press the **Select** soft key.
- 4 Do one of the following
- 5 Press the **OK** soft key to return to the **EtherStats** submenu.
 - Use the **Navigation** keys to browse the data.

- 6 Press the **Cancel** soft key to return to the **EtherStats** submenu.

—End—

IP Statistics Use [Procedure 113 "Browsing IP Statistics" \(page 479\)](#) to access the **IP Stats** submenu item in Remote mode.

Procedure 113
Browsing IP Statistics

Step	Action
1	Select IP Stats from the Diagnostics submenu. The IP Statistics appear on the display.
2	Do one of the following <ul style="list-style-type: none"> • Press the OK soft key to return to the Diagnostics submenu. • Use the Navigation keys to scroll through the data display results. See Figure 66 "IP Networking statistics data display screen" (page 489). • Press the Cancel soft key to return to the Diagnostics submenu.

—End—

RUDP Statistics Use [Procedure 114 "Browsing RUDP Statistics" \(page 479\)](#) to access the **RUDP Stats** submenu item in Remote mode.

Procedure 114
Browsing RUDP Statistics

Step	Action
1	Select RUDP Stats from the Diagnostics submenu. The RUDP statistics appear on the display.
2	Do one of the following <ul style="list-style-type: none"> • Press the OK soft key to return to the Diagnostics submenu. • Use the Navigation keys to scroll through the data display results. See Figure 67 "RUDP statistics data display page" (page 489). • Press the Cancel soft key to return to the Diagnostics submenu.

—End—

QoS Statistics Use [Procedure 115 "Browsing Quality of Service Statistics" \(page 480\)](#) to access the **QoS Stats** submenu item in Remote mode.

Procedure 115

Browsing Quality of Service Statistics

Step	Action
------	--------

- | | |
|---|--|
| 1 | Select QoS Stats from the Diagnostics submenu. The Quality of Service statistics appear on the display. |
| 2 | Do one of the following <ul style="list-style-type: none"> • Press the OK soft key to return to the Diagnostics submenu. • Use the Navigation keys to scroll through the results. See Figure 68 "QoS statistics data display page" (page 490). • Press the Cancel soft key to return to the Diagnostics submenu. |

The IP Phone display returns to an idle state after 5 minutes if the user does not interact with menu items.

—End—

Network Diagnostic Utilities data display pages

Data from the diagnostic utilities is displayed on the IP Phone display. One line of data at a time is displayed on IP Phone 2001 and IP Phone 2002 and 3 lines of data are displayed at a time on IP Phone 2004. Each line of data is up to 24 characters in length. Use the **Navigation** keys to scroll through the lines of data.

Local Mode data display pages

The following figures illustrate the Network Diagnostic Utilities data display pages in Local Mode.

Ping [Figure 56 "PING data display page" \(page 481\)](#) illustrates the data displayed from the **Ping** diagnostic tool.

Figure 56
PING data display page

```

xxx: xxxxxx xxxxxx xxxxxx
IP: xxx.xxx.xxx.xxx

```

In Figure 56 "PING data display page" (page 481),

- PacketTx = packets sent
- PacketRx = packets received

TraceRoute Figure 57 "TraceRoute data display screen" (page 481) illustrates the data displayed from the **TraceRoute** diagnostic tool. Browse through the last 30 items by pressing the **Navigation** keys.

Figure 57
TraceRoute data display screen

```

xxx: xxxxxx xxxxxx xxxxxx
IP: xxx.xxx.xxx.xxx

```

In Figure 57 "TraceRoute data display screen" (page 481),

- xxx: = Time To Live (TTL):Round Trip Time1, Round Trip Time2, Round Trip Time3

- IP: = IP address

Ethernet Statistics Figure 58 "Ethernet Statistics data display page" (page 482) illustrates the data displayed from the **Ethernet Statistics** submenu item.

Figure 58
Ethernet Statistics data display page

```

1.Link: UP/Down
2.Duplex:Full/Half
3.Speed: xxx (MB)
4.Auto Sense/Negotiate
Auto-Nego Capability: Y/N
Auto-Nego Completed: Y/N
5.VLANPriority:xxx
6.VLANID:xxxx
7.PktColl:xxxxxxxxxx
8.CRCErrors:xxxxxxxxxx
9.FrameErrors:xxxxxxxxxx

```

In Figure 58 "Ethernet Statistics data display page" (page 482),

- Duplex = duplex mode
- Speed = network speed 10MB/100MB
- Auto Sense/Negotiate = Auto Negotiate Protocol Received or Not (Y – Yes, N – No)

In the **IP Phone Configuration** menu, Auto Negotiate mode is the default setting for initial startup. If the telephone connects to a network that supports Auto Negotiate, it selects the best speed and duplex mode available. For more information, the applicable IP Phone section in this document.

- VLANPriority = IP Phone VLAN priority
- VLANID = IP Phone VLAN ID
- PCollision = network packet collision peg counts
- CRCErrors = network CRC errors peg counts
- FrameErrors = network Framing errors peg counts

IP Networking Statistics Figure 59 "IP Networking Statistics data display screen" (page 483) illustrates the data displayed from the **IP Networking Statistics** submenu item.

Figure 59
IP Networking Statistics data display screen

```
1. Packet Tx: xxxxxxxxxxxx
2. PacketRx: xxxxxxxxxxxx
3. BcastPktRx: xxxxxxxxxxxx
4. McastPktRx: xxxxxxxxxxxx
5. InPktDisc: xxxxxxxxxxxx
6. OutPktDisc: xxxxxxxxxxxx
7. UnknownPkts: xxxxxxxxxxxx
8. ICMPType—Code: xxx—xxx
```

In Figure 59 "IP Networking Statistics data display screen" (page 483),

- PacketTx = IP Phone packets sent
- PacketRx = IP Phone packets received
- BcastPktRx = broadcast packets received
- McastPktRx = multicast packets received
- InPktDisc = incoming packets discarded
- OutPktDisc = outgoing packets discarded
- UnknownPkts = unknown protocol packets discarded
- ICMPType-Code = the last ICMP message: XXX-XXX

DHCP Statistics Figure 60 "DHCP information data display page" (page 484) illustrates the data displayed from the **DHCP Statistics** submenu item.

Figure 60
DHCP information data display page

```

1.Configuration:
NetworkDataValided:Yes/No
MACAddressStored:Yes/No
PerformDHCP:Full/Partial
VLANEnable:Yes/No
VLANConfig:Manual/Auto
VLANIDsDiscovered:Yes/No
PrimaryServer:S1/S2
2.FWVersion:xxxxxxx
3.HWIDxxxxxxxxxxxxxxxxxxxxx
4.SetIP:xxx.xxx.xxx.xxx
5.SbMask:xxx.xxx.xxx.xxx
6.GtWay:xxx.xxx.xxx.xxx
7.PROMS1:xxx.xxx.xxx.xxx
  Port:xxxx Act:xxx
  Retries:xxx
8.PROMS2:xxx.xxx.xxx.xxx
  Port:xxxx Act:xxx
  Retries:xxx
9.VLANPriority:xxx
10.VLANID:xxxx
11.DHCPRespondString:
xxxxxxxxxxxxxxxxxxxxxxxxxxx
xxxxx.....
12.Servers'Information:
  SN:xxx.xxx.xxx.xxx
  Port:xxxx Act:xxx
  Retries:xxx FailOver:xxx

```

In Figure 60 "DHCP information data display page" (page 484),

- NetworkDataValided = is EEPROM Network Data validated?
- MACAddressStored = is MAC Address stored in EEPROM?
- FWVersion = IP Phone firmware version
- HWID = IP Phone hardware ID
- SbMask = subnet mask

- GtWay = Gateway
- PROMS1 = EEPROM Server1 information
- PROMS2 = EEPROM Server2 information
- Sn = S: Server n is from 1 to 16

UNIStim/RUDP statistics Figure 61 "UNIStim/RUDP statistics data display screen (TPS)" (page 485) shows the data displayed from the **UNIStim/RUDP statistics** submenu item.

Figure 61
UNIStim/RUDP statistics data display screen (TPS)

```
1.MessageTx:xxxxxxxxxxxxx
2.MessageRX:xxxxxxxxxxxxx
3.Retries:xxxxxxxxxxxxx
4.UpTime:xxx/xx/xx/xx
```

In Figure 61 "UNIStim/RUDP statistics data display screen (TPS)" (page 485),

- MessageTx = messages sent
- MessageRx = messages received
- Retries = number of retries
- UpTime = up-time of current TPS registration (days/hours/minutes/seconds)

RTP/RTCP statistics Figure 62 "RTP/RTCP statistics data display page" (page 486) shows the data displayed from the **RTP/RTCP statistics** submenu item.

Figure 62
RTP/RTCP statistics data display page

```
1.EndIP:xxx.xxx.xxx.xxx
2.PortID:xxxx
3.PacketTX:xxxxxxxxxxx
4.PacketRx:xxxxxxxxxxx
5.DiscPktRx:xxxxxxxxxxx
6.PacketLossRx:xxx%
7.JittAveRx:xxxxxxxxxxx
8.JittMaxRx:xxxxxxxxxxx
9.RdTripDelay:xxxxx ms
```

In [Figure 62 "RTP/RTCP statistics data display page"](#) (page 486),

- EndIP = endpoint IP address
- PortID = port ID
- PacketTx = RTP packets sent
- PacketRx = RTP packets received
- DPacketRx = BTR Disorder packets received
- PacketLossRx = packet loss received xxx%
- JittAveRx = jitter average received xxxxxx
- JittMaxRx = jitter maximum received xxxxxx
- RdTripDelay = round trip delay

Each new call resets the counters.

Remote Mode data display pages

The following figures illustrate the **Network Diagnostic Utilities** data display pages in Remote Mode.

PING [Figure 63 "Ping data display page"](#) (page 487) shows the data displayed from the **Ping** Diagnostic Tool.

Figure 63
Ping data display page

```

Rx 64 bytes time xx ms
Rx 64 bytes time xx ms
Rx 64 bytes time xx ms
For xxx.xxx.xxx.xxx
PacketTx:xxx
Packet Loss = xx%
Min RTT: xxx ms
Avg RTT: xxx ms
Max RTT: xxx ms

```

In Figure 63 "Ping data display page" (page 487),

- Packet TX = packets sent
- Packet Rx = packets received
- RTT - Round Trip Time (for Min RTT, Avg RTT, and Max RTT)

TraceRoute Figure 64 "Tracert data display screen" (page 487) shows the data displayed from the **Tracert** Diagnostic tool.

Figure 64
Tracert data display screen

```

Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx
Hopxxx: RTT = xxx xxx xxx
IP: xxx.xxx.xxx.xxx

```

In Figure 64 "Tracert data display screen" (page 487),

- Hopxxx = the Hop number
- xxx = Round Trip Time1, Round Trip Time2, Round Trip Time3
- IP: = IP address

Ethernet Statistics Figure 65 "Ethernet statistics data display screen" (page 488) shows the data displayed from the **EtherStats** submenu item.

Figure 65
Ethernet statistics data display screen

```
1.Link: UP/Down
2.Duplex:Full/Half
3.Speed: xxx (MB)
4.Auto Sense/Negotiate
Auto-Nego Capability: Y/N
Auto-Nego Completed: Y/N
5.VLANPriority:xxx
6.VLANID:xxxx
7.PktColl:xxxxxxxxxxx
8.CRCErrors:xxxxxxxxxxx
9.FrameErrors:xxxxxxxxxxx
```

In Figure 65 "Ethernet statistics data display screen" (page 488),

- Duplex - duplex mode
- Speed - network speed 10MB/100MB
- Auto Sense/Negotiate = Auto Negotiate Protocol Received or Not (Y - Yes, N - No)
- VLANPriority = IP Phone VLAN priority
- VLANID = IP Phone VLAN ID
- PCollision = network packet collision peg counts
- CRCErrors = network CRC errors peg counts
- FrameErrors = network Framing errors peg counts

In the **IP Phone Configuration** menu, Auto Negotiate mode is the default setting for initial startup. If the telephone connects to a network that supports Auto Negotiate, it selects the best speed and duplex mode available. For more information, see the applicable IP Phone section in this document.

IP Networking Statistics Figure 66 "IP Networking statistics data display screen" (page 489) shows the data displayed from the **IP Stats** submenu item.

Figure 66
IP Networking statistics data display screen

```

1. Packet TX: xxxxxxxxxxxx
2. Packet Rx: xxxxxxxxxxxx
3. BcastPktRx: xxxxxxxxxxxx
4. McastPktRx: xxxxxxxxxxxx
5. InPktDisc: xxxxxxxxxxxx
6. OutPktDisc: xxxxxxxxxxxx
7. UnknownPkts: xxxxxxxxxxxx
8. ICMPTypeCode: xxx-xxx

```

In Figure 66 "IP Networking statistics data display screen" (page 489),

- PacketTx = IP Phone packets sent
- PacketRX = IP Phone packets received
- BcastPktRx = broadcast packets received
- McastPkeRx = multicast packets received
- InPktDisc = incoming packets discarded
- OutPktDisc = outgoing packets discarded
- UnknownPkts = unknown protocol packets discarded
- ICMPTypeCode = the last ICMP message: xxx-xxx

RUDP statistics data display screen (TPS) Figure 67 "RUDP statistics data display page" (page 489) shows the data displayed from the **RUDP Stats** submenu item.

Figure 67
RUDP statistics data display page

```

1.MessageTx:xxxxxxxxxxxxx
2.MessageRx:xxxxxxxxxxxxx
3.Retries:xxxxxxxxxxxxx
4.UpTime:xxx/xx/xx/xx

```

In Figure 67 "RUDP statistics data display page" (page 489),

- MessageTx = messages sent
- MessageRx = messages received
- Retries = number of retries
- UpTime = up-time of current TPS registration (days/hours/minutes/seconds)

Quality of Service statistics Figure 68 "QoS statistics data display page" (page 490) shows the data displayed from the **QoS Stats** menu item.

Figure 68
QoS statistics data display page

```

FarEndIP:xxx.xxx.xxx.xxx
PortEndPortID:xxxx
LocPktLossRx:xxxxxxxxxxxxx
LocJittAvgRx:xxx
LocLatAvg:xxx
LocPktTx:xxx
LocPktRx:xxx
LocOutOrdRx:xxx
LocListR:xxx
RmtPktLossRx:xxx
RmtJittAvgRx:xxx
RmtLatAvg>xxx
RmtListR:xxx

```

In Figure 68 "QoS statistics data display page" (page 490),

- EndIP = endpoint IP address
- PortID = port ID
- PacketTx = RTP packets sent
- Packet Rx = RTP packets received
- DPacketRx = BTR Disorder packets received
- PacketLossRx = packet loss received xxx%
- JittAveRx = jitter average received xxxxxx
- JittMaxRx = jitter maximum received xxxxxx
- RdTripDelay = round trip delay

Each new call resets the counters.

Network Address Translation Traversal

This section describes the Network Address Translation (NAT) Traversal feature as it effects IP Phones. NAT Traversal is required to permit IP Phones working behind a NAT box to connect and maintain signaling and media paths.

NAT Traversal is applicable to all UNISTim IP Phone clients and is one-ended. That is, it does not require the other end of a call to support any special protocol, and it is interoperable with any other media termination.

In this document NAT refers to both IP port address mapping and IP address mapping (also known as NAPT). A NAT is used with or without a Virtual Private Network (VPN).

The NAT Traversal feature supports only IP clients behind cone NAT types. Three types of cone NAT are: full cone, restricted cone, and port restricted cone. NAT traversal is not compatible with symmetric NATs. If the IP Phone is behind a Symmetric NAT, the LTPS unregisters the phone from the call server (while remaining registered on the LTPS), and displays the following message on the IP Phone display: *Error! Symmetric NAT.*

For detailed information about the NAT Traversal feature, see *IP Line Fundamentals (NN43100-500)*.

For information about accessing NAT information from an IP Phone, see "[Set IP Information](#)" (page 492).

ATTENTION

Nortel recommends partial DHCP configuration for IP Phones residing behind a NAT router unless the NAT router supports special configuration of the DHCP server. For more information, see *IP Line Fundamentals (NN43100-500)*.

General Information

The General Information menu displays information about the IP Phone. To access the General Information menu, press **Services > Telephone Options > Set Information > General Information**.

The General Information menu displays the following information about the IP Phone

- Hardware ID
- Terminal Type
- Release Number
- Manufacturer Code
- Color Code
- Set TN
- Registered TN
- EEPROM Data Validity
- Set IP Information

For further information about the Set IP Information menu option, see "[Set IP Information](#)" (page 492).

- Ethernet Information

For further information about the Ethernet Information menu option, see ["Ethernet Information" \(page 492\)](#)

- Server Information

For further information about the Server Information menu option, see ["Server Information" \(page 493\)](#)

Set IP Information

IP Phones which do not reside behind a NAT device display the following information

Set IP:
SIG:
x.x.x.x:yyyy
GW:
x.x.x.x
Mask:
xxx.xxx.xxx.xxx

IP Phones which reside behind a NAT device display the following information

Public Set IP
SIG:
x.x.x.x:yyyy
Public Set IP
RTP:
x.x.x.x:yyyy
Private Set IP
SIG:
x.x.x.x:yyyy
Private Set IP
RTP:
x.x.x.x:yyyy
GW:
x.x.x.x
Mask:
xxx.xxx.xxx.xxx
Type of NAT:
Cone

Ethernet Information

The following information is accessed through the Ethernet Information menu

- MAC Address Stored
- VLAN Enabled

- VLAN Configuration
- VLAN Discovered
- VLAN Priority
- VLAN ID

Server Information

The following information is accessed through the Server Information menu

- Node IP
- Node ID
- ITG IP Address
- Perform DHCP
- Primary Server
- S1, S2 IP Address
- S1, S2 Port
- S1, S2 Action
- S1, S2 Retry Count
- DHCP Server IP Address

Using CLI Commands

IDU commands

The system-based IDU command in LD 32 is used to test the end-to-end IP connectivity of the IP Phone from the call server console instead of using set-based diagnostics.

The IDU command provides the following information

- TN
- TN ID
- MAC address
- IP address
- LTPS IP address
- Manufacturer code
- Model
- NT code
- Color code
- Release code
- Serial number

- Firmware/Software version

For an IP Phone behind a NAT, the IP address is composed of the public address followed by the private address in parentheses (see [Table 70 "IDU command printout in LD 32 for IP Phone with a NAT" \(page 494\)](#)). For an IP Phone without a NAT, the IP address is the signaling IP address of the IP Phone as seen by the LTPS (see [Table 71 "IDU command printout in LD 32 for IP Phone without a NAT" \(page 495\)](#)).

For detailed information, see *Software Input Output Reference—Maintenance (NN43001-711)*.

[Table 70 "IDU command printout in LD 32 for IP Phone with a NAT" \(page 494\)](#) and [Table 71 "IDU command printout in LD 32 for IP Phone without a NAT" \(page 495\)](#) provide the output format of the IDU commands in LD 32.

[Table 70 "IDU command printout in LD 32 for IP Phone with a NAT" \(page 494\)](#) provides the output format of the IDU commands in LD 32 for an IP Phone with a NAT.

Table 70
IDU command printout in LD 32 for IP Phone with a NAT

Item	Description
ISET TN:	l s c u
TN ID CODE:	2001P2, 2002P1, 2002P2, 2004P1, 2004P2, 2050PC
ISET MAC ADR	xx.xx.xx.xx.xx.xx
ISET IP ADR	xx.x.x.xxx:xxxx(xxx.xxx.x.xx)
LTPS IP ADR	xx.xx.xxx.xx
MANUFACTURER CODE	[NAME]
MODEL	
NT CODE:	xxxxxxx
COLOR CODE:	xx
RLS CODE:	x
SER NUM:	xxxxxx
FW/SW VERSION	xxxxxxx

Table 71 "IDU command printout in LD 32 for IP Phone without a NAT" (page 495) provides the output format of the IDU commands in LD 32 for an IP Phone without a NAT.

Table 71
IDU command printout in LD 32 for IP Phone without a NAT

Item	Description
ISET TN:	l s c u
TN ID CODE:	2001P2, 2002P1, 2002P2, 2004P1, 2004P2, 2050PC
ISET MAC ADR	xx.xx.xx.xx.xx
ISET IP ADR	xx.x.x.xxx:xxxx
LTPS IP ADR	xx.xx.xxx.xx
MANUFACTURER CODE	[NAME]
MODEL	
NT CODE:	xxxxxxxx
COLOR CODE:	xx
RLS CODE:	x
SER NUM:	xxxxxx
FW/SW VERSION	xxxxxxxx

If the IDU command cannot retrieve the information shown in Table 70 "IDU command printout in LD 32 for IP Phone with a NAT" (page 494) or Table 71 "IDU command printout in LD 32 for IP Phone without a NAT" (page 495), it responds with one of the following

- prints the IP Phone IP address and the Voice Gateway Media Card address, and generates an NPR0503 message
- the IP Phone is not registered with the Call Server and generates an NPR0048 message
- the IP Phone is registered, but the Call Server is not responding, and generates an NPR0503 message

Graphic-based diagnostics utilities

Graphic diagnostic utilities are available on the IP Phone 2007, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E.

For information about diagnostic utilities for the IP Phone 2007, see "[Local Diagnostics for the IP Phone 2007](#)" (page 496). For information about diagnostic utilities for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E, see "[Local Diagnostics for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E](#)" (page 501).

Local Diagnostics for the IP Phone 2007

To access the Local Diagnostics menu on the IP Phone 2007, tap the **Tools** icon then tap the **Local Diagnostics** menu entry. The Local Diagnostics menu displays the following items

- Network Diagnostic Tools
- Ethernet Statistics
- IP Network Statistics
- IP Set&DHCP Information

You can press the **Return** soft key in any submenu item screen to return to the Local Diagnostics submenu. Therefore, you can gather information and run tests without exiting and reentering the Local Diagnostics menu.

Use [Procedure 116 "Using Network Diagnostic Tools"](#) (page 496) to access Network Diagnostic Tools.

Procedure 116 Using Network Diagnostic Tools

Step	Action
1	Tap the Tools icon.
2	Tap the Local Diagnostics menu entry.
3	Tap the Network Diagnostic Tools soft key. The screen displays Ping , Tracert , and EXIT soft keys, presents a pull-down list for IP addresses, and displays the Ping and Hop parameters.
4	Scroll down through the IP addresses and tap an address.
5	The number of repetitions of the Ping command are shown in the top bar of the screen. The default is 4. To change the number of repetitions, tap on the number and enter a new value using the USB keyboard.
6	The number of hops for the Tracert command are shown in the top bar of the screen. The default is 30.

To change the number of hops, tap on the number and enter a new value using the USB keyboard.

- 7 Tap the **Ping** soft key to have the telephone attempt to access the IP address up to the number of times shown on the top of the screen.

The IP Phone displays the following

```
Pinging x.x.x.x with 64 bytes
(where x.x.x.x is the IP address chosen in step 4)
```

The **Exit** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone attempts to contact (ping) the address the number of configured times, displaying the results of each attempt.

- 8 To stop the ping before completing, tap the **Stop** soft key.

The **Stop** key becomes the **Exit** soft key. The results of ping are displayed as follows

- Packets transmitted (Tx)
- Packets received (Rx)
- Packets lost (Lost)
- Minimum round trip time (Min)
- Maximum round trip time (Max)
- Average round trip time (Avg)

- 9 Tap the **Tracert** soft key to request the IP Phone to trace the route to the entered IP address, up to MaxHop nodes.

The IP Phone displays the following

```
Tracing route to: (x.x.x.x) over a maximum of
y hops
(where x.x.x.x is the IP address chosen in step 4 and y is the
number of hops displayed at the top of the screen)
```

The **Exit** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone traces the route to the address for the configured number of server hops, displaying the hop number (starting at 0), the time in milliseconds, and the IP address.

When the trace is complete, the screen displays the following
Trace complete.

- 10 To stop Tracert before it completes, tap the **Stop** soft key.

The **Stop** soft key becomes the **Exit** soft key when Tracert stops.

- 11 Tap the **Exit** soft key to return to the Local Diagnostics menu.

—End—

Procedure 117

Using Ethernet Statistics tool

Step	Action
1	Tap the Tools icon.
2	Tap the Local Diagnostics menu entry.
3	Tap the Ethernet Statistics soft key. The tool displays Reset , NIPort , and EXIT soft keys, and the statistics for the Network Interface Port (NIPort). The following statistics are displayed <ul style="list-style-type: none"> • Link Status • Duplex Mode • Network Speed • AutoSense/Negotiate Capability • AutoSense/Negotiate Completed • Port VLAN Priority • Port VLAN ID • Packet Collision • CRC Error count • Frame Error count
4	To reset the NIPort counters to 0, tap the Reset soft key.
5	Tap the NIPort soft key. The NIPort soft key changes to the PCPort soft key and the tool displays the statistics for the Personal Computer port (PCPort). The following statistics are displayed <ul style="list-style-type: none"> • Link Status • Duplex Mode • Network Speed

- AutoSense/Negotiate Capability
- AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count

6 To reset the PCPort statistics to 0, tap the **Reset** soft key.

—End—

Procedure 118

Using the IP Network Statistics tool

Step	Action
1	Tap the Tools icon.
2	Tap the Local Diagnostics soft key.
3	Tap the IP Network Statistics soft key. The tool displays the Reset, NIPort, and Exit soft keys, and the statistics for the Network Interface Port (NIPort). The following statistics are displayed <ul style="list-style-type: none"> • Packets sent • Packets received • Broadcast Packets received (Rx) • Multicast Packets received (Rx) • Incoming Packets discarded • Outgoing Packets discarded • Unknown protocols (Unknown protos) • Last Internet Control Message Protocol (ICMP) message type and code (ICMP Type/Code)
4	To reset the NIPort counters to 0, tap the Reset soft key.
5	Tap the NIPort soft key.

- Packets sent
- Packets received
- Broadcast Packets received (Rx)
- Multicast Packets received (Rx)
- Incoming Packets discarded
- Outgoing Packets discarded
- Unknown protocols (Unknown protos)
- Last Internet Control Message Protocol (ICMP) message type and code (ICMP Type/Code)

The **NIPort** soft key becomes the **PCPort** soft key, and the statistics for the Personal Computer Port (PCPort) are displayed.

The following statistics are displayed

- Packets sent
- Packets received
- Broadcast Packets received (Rx)
- Multicast Packets received (Rx)
- Incoming Packets discarded
- Outgoing Packets discarded
- Unknown protocols (Unknown protos)
- Last Internet Control Message Protocol (ICMP) message type and code (ICMP Type/Code)

- 6 To reset the PCPort counters to 0, tap the **Reset** soft key.
- 7 Tap the **Exit** soft key to return to the Local Diagnostics menu.

—End—

Procedure 119

Using the IPSet and DHCP Information tool

Step	Action
------	--------

- | | |
|---|---|
| 1 | Tap the Tools icon. |
| 2 | Tap the Local Diagnostics soft key. |
| 3 | Tap the IPSet&DHCP Information soft key. |

The tool displays the **Exit** soft key at the bottom of the display and the following information

- Configuration
 - Network data validated, MAC address stored, DHCP setting
 - Voice VLAN status, type of configuration and discovery status
 - Primary Server identification
- Firmware version and Hardware Identification number
- Telephone Set IP address
- Network subnet mask

- Gateway IP address
 - EPROM Server S1 and S2 IP addresses, ports, actions, and number of retries
 - Voice VLAN priority and VLAN ID
 - DHCP Respond String
 - Server Information for S01, S02, S03, and S04, including IP addresses, ports, actions, number of retries, and failover values
- 4 Use the scroll bar to display all the information.
 - 5 Tap the **Exit** soft key to return to the Local Diagnostics menu.

—End—

Local Diagnostics for the IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E

The Local Diagnostics submenu offers the following choices

- 1. IP Set&DHCP Information
- 2. Network Diagnostic Tools
- 3. Ethernet Statistics
- 4. IP Network Statistics
- 5. USB Devices

Figure 69
Local Diagnostics menu



1. IP Set and DHCP Information

Use [Procedure 120 "Using the IP Set and DHCP Information tool"](#) (page 502) to use the IP Set&DHCP Information tool.

Procedure 120

Using the IP Set and DHCP Information tool

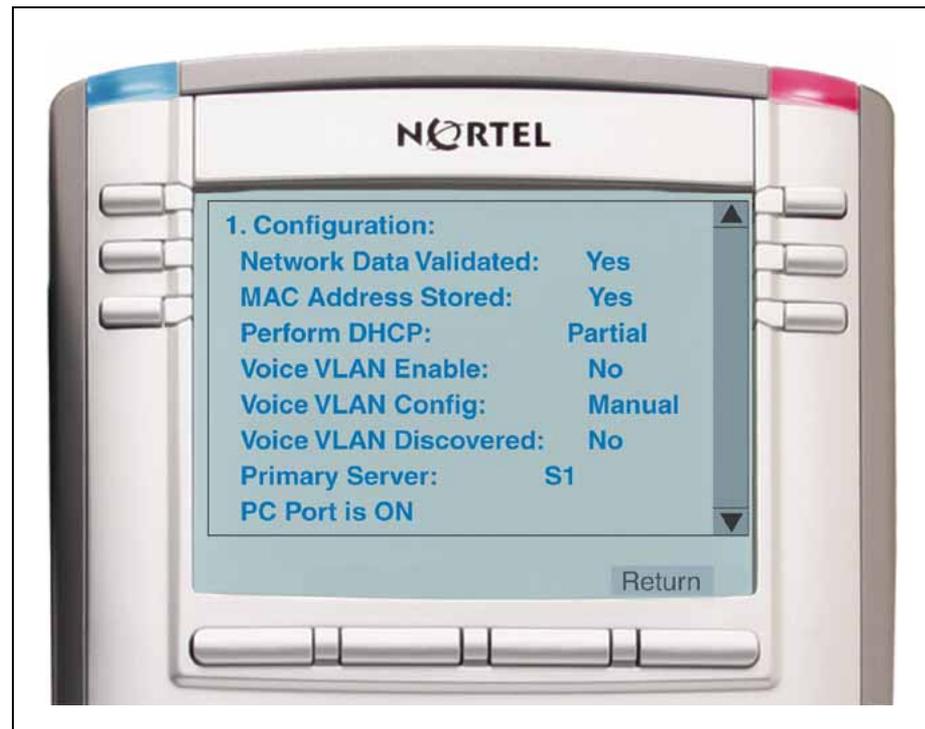
Step	Action
1	Press the Services key twice.
2	Press 2 1 on the dialpad to access the IP Set&DHCP Information menu or use the Up/Down navigation keys to scroll and highlight the IP Set & DHCP Information option.
3	Press the Select soft key. You can press the Return soft key to exit the menu and return to Local Diagnostics submenu. The tool displays the following information <ul style="list-style-type: none"> • Configuration <ul style="list-style-type: none"> — Network data validated, MAC address stored, DHCP setting — Voice VLAN status, type of configuration and discovery status

— Primary Server identification, PC Port enabled status

- Firmware version and Hardware Identification number
- Telephone Set IP address
- Network subnet mask
- Gateway IP address
- EPROM Server S1 and S2 IP addresses, ports, actions, and number of retries
- Voice VLAN priority and VLAN ID
- DHCP Response String
- Server information for S01, S02, S03, and S04, including IP addresses, ports, actions, number of retries, and failover values
- TFTP Server IP address

Figure 70 "IP Set and Information screen" (page 503) shows IP Set & DHCP Information screen.

Figure 70
IP Set and Information screen



4 Use the scroll bar to display all the information.

- 5 Press the **Return** soft key to return to the **Local Tools** menu or the **Stop** key to exit the menu and return to the IP Phone display.

—End—

2. Network Diagnostic Tools

The Network Diagnostic Tools menu contains the following menu items

- IP/MaxPing/MaxHop
- Ping
- Tracert
- Exit

Use [Procedure 121 "Using Network Diagnostic Tools" \(page 504\)](#) to access Network Diagnostic Tools.

Procedure 121

Using Network Diagnostic Tools

Step	Action
1	Press the Services key twice.
2	Press 2 2 on the dialpad to access the Network Diagnostic Tools menu or use the Up/Down navigation keys to scroll and highlight the IP Set & DHCP Information option.
3	Press the Select soft key. You can press the Return soft key exit the menu to return to the Local Diagnostics submenu. The screen displays IP/MaxPing/MaxHop , Ping , Tracert , and Return soft keys. Figure 71 "Network Diagnostic Tools screen" (page 505) shows the Network Diagnostic Tools screen.

Figure 71
Network Diagnostic Tools screen



- 4 Enter an IP address or use the Up/Down navigation keys to scroll down through the IP addresses.
- 5 The number of repetitions of the **Ping** command is shown in the top bar of the screen. The default is 4.
 To change the number of repetitions, use the arrow keys to select the number and enter a new value using the dialpad.
- 6 The number of hops for the **Tracert** command is shown in the top bar of the screen. The default is 30.
 To change the number of hops, use the arrow keys to select the number and enter a new value using the dialpad.
- 7 Press the **Ping** soft key to have the IP Phone attempt to access the IP address, up to the number of times shown on the top of the screen.

The IP Phone displays the following

```
Pinging x.x.x.x with 64 bytes
(where x.x.x.x is the entered IP address)
```

The **Return** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone attempts to contact (ping) the address the number of configured times, and displays the results of each attempt.

- 8 To stop the ping before completing, tap the **Stop** soft key.

The **Stop** soft key becomes the **Return** soft key. The results of ping are displayed as follows

- Packets transmitted (Tx)
- Packets received (Rx)
- Percentage of Packets Lost (Lost)
- Minimum round trip time (Min)
- Maximum round trip time (Max)
- Average round trip time (Avg)

- 9 Press the **Tracert** soft key to request the IP Phone to trace the route to the entered IP address, up to MaxHop nodes.

The IP Phone displays the following

```
Tracing route to: (x.x.x.x) over a maximum of y
hops
(where x.x.x.x is the entered IP address and y is the number of hops
displayed at the top of the screen)
```

The **Return** soft key changes to **Stop** and the other soft keys become blank.

The IP Phone traces the route to the address for the configured number of server hops, displaying the hop number (starting at 0), the time in milliseconds, and the IP address.

When the trace is complete, the screen displays the following

```
Trace complete.
```

- 10 To stop Tracert before it completes, tap the **Stop** soft key.

The **Stop** soft key becomes the **Return** soft key when Tracert stops.

- 11 Tap the **Return** soft key to return to **Local Tools** menu or the **Stop** key to exit the menu and return to the IP Phone display.

—End—

3. Ethernet Statistics

Use [Procedure 122 "Using Ethernet Statistics tool" \(page 507\)](#) to use the Ethernet Statistics menu.

Procedure 122
Using Ethernet Statistics tool

Step Action

- 1 Press the **Services** key twice.
- 2 Press 2 3 on the dialpad to access the **Ethernet Statistics** menu or use the Up/Down navigation keys to scroll and highlight the **Ethernet Statistics** option.
- 3 Press the **Select** soft key.

You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu.

The screen displays **Reset**, **Nlport/PCport**, and **Return** soft keys. The **Nlport/PCport** soft key is used to select the Network (NI) Port or the PC (PC) Port. The soft key label indicates the current display page. For example, when NIport appears on the soft key label, the information showing on the display is for the network interface port.

When NIport appears on the second soft key label, the following statistics are displayed

- Link Status
- Duplex Mode
- Network Speed (10 Mb, 100 Mb, or 1 G)
- AutoSense/Negotiate
 - AutoSense/Negotiate Capability
 - AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count
- Unicast Packets Sent
- Unicast Packets Received
- Broadcast Packets Received
- Multicast Packets Received
- 802.1x Status (EAP Status)

4 To reset the NIPort counters to 0, press the **Reset** soft key.

5 Press the **NIPort** soft key.

The **NIPort** soft key changes to the **PCPort** soft key and the tool displays the statistics for the Personal Computer port (PCPort). The following PCPort statistics are displayed

- Link Status
- Duplex Mode
- Network Speed
- AutoSense/Negotiate Capability
- AutoSense/Negotiate Completed
- Port VLAN Priority
- Port VLAN ID
- Packet Collision
- CRC Error count
- Frame Error count
- Unicast Packets Sent
- Unicast Packets Received
- Broadcast Packets Received
- Multicast Packets Received

Figure 72 "Ethernet Statistics display screen" (page 509) shows Ethernet Statistics display screen.

Figure 72
Ethernet Statistics display screen



- 6 To reset the PCPort statistics to 0, tap the **Reset** soft key.

—End—

4. IP Network Statistics

Use [Procedure 123 "Using the IP Network Statistics tool"](#) (page 509) to use the Network Statistics tool.

Procedure 123

Using the IP Network Statistics tool

Step	Action
1	Press the Services key twice.
2	Press 2 4 on the dialpad to access the IP Network Statistics menu or use the Up/Down navigation keys to scroll and highlight the IP Network Statistics option.
3	Press the Select soft key. You can press the Return soft key exit the menu to return to the Local Diagnostics submenu.

- 4 The screen displays **Reset**, **Refresh**, and **Return** soft keys. The Refresh soft key (second soft key on the display) refreshes the counts on the display. This display shows the Network statistics for the IP Phone port of the 3 port switch.

The following statistics are displayed

- Packets sent
- Packets received
- Incoming Packet errors
- Outgoing Packet errors
- Incoming Packets discarded
- Outgoing Packets discarded
- Unknown protocols (Unknown protos)
- Last Internet Control Message Protocol (ICMP) message type and code (The Last ICMP Type/Code)

Figure 73 "IP Networks Statistics screen" (page 510) shows IP Networks Statistics screen.

Figure 73
IP Networks Statistics screen



- 5 To reset the NIPort counters to 0, press the **Reset** soft key.

- 6 The display counter values are a snapshot and the displayed counter values do not change while the display is shown. To refresh them as you view the counter display, press the **Refresh** soft key.
- 7 You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu, or you can press the **Stop** key to close the menu and return to the IP Phone display.

—End—

5. USB Devices

The USB Devices tool provides information about an Universal Serial Bus (USB) devices that connect to your IP Phone. The IP Phone automatically detects USB devices when they are connected to the USB port in the back of the IP Phone. The IP Phone enumerates and lists any USB device, but only USB mice and USB keyboards are used. The display shows the descriptive text string received from the USB device.

Procedure 124

Using the USB Devices tool

Step	Action
------	--------

- 1 Press the **Services** key twice.
- 2 Press 2 5 on the dialpad to access the **USB Devices** menu or use the Up/Down navigation keys to scroll and highlight the USB Devices option.
- 3 Press the **Select** soft key.
You can press the **Return** soft key exit the menu to return to the **Local Diagnostics** submenu.

—End—

Appendix G

Bluetooth wireless technology

Contents

This section contains the following topics:

- "Introduction" (page 513)
- "Description" (page 513)

Introduction

Bluetooth wireless technology is supported on the IP Phone 1140E and the IP Phone 1150E. The IP Phone 1120E does not support Bluetooth wireless technology.

On the IP Phone 1150E, only the Agent port supports Bluetooth wireless technology.

Description

The IP Phone 1140E and the IP Phone 1150E contain both hardware and software support for Bluetooth wireless technology enabled headsets. When the IP Phone powers up, Bluetooth wireless technology is disabled and must be explicitly re-enabled.

Supported Bluetooth wireless technology headsets

The following Bluetooth wireless technology headsets are supported

- Plantronics P251N, P261N, CS55, Voyager 510S (IP Phone 1140E, and IP Phone 1150E)
- GNNetcom GN 2120 NCD, GN 9120 Flex (IP Phone 1150E *only*)
- GNNetcom Liberation (IP Phone 1150E *only*)

To select a Bluetooth wireless technology headset type for the IP Phone 1150E, select Headset Type from the Telephone Options menu.

Enabling Bluetooth wireless technology

The following methods are available to enable Bluetooth wireless technology on the IP Phone

- Manual configuration— is used to set the Bluetooth wireless technology mode on the IP Phone on a phone-by-phone basis. If manual configuration is used exclusively, a TFTP server is not required to configure Bluetooth wireless technology. For further information about manual configuration, see "[Manual configuration](#)" (page 514).

Use [Procedure 125 "Configure the Bluetooth wireless technology administration setting"](#) (page 515) to configure the Bluetooth wireless technology through the **Local Tools > Network Configuration** submenu.

- TFTP configuration—is used to initially set the Bluetooth wireless technology mode then the TFTP Server can be removed. The IP Phone now retains the value and uses the last value received if no new value is received.

Use [Procedure 126 "Enabling Bluetooth wireless technology on the IP Phone 1140E"](#) (page 516) to enable Bluetooth wireless technology on the IP Phone 1140E using the TFTP configuration file (1140e.cfg) retrieved during bootup.

If Bluetooth wireless technology is enabled on your phone, and password-protection for the Local Tools menu has been enabled, you can still double-press the **Headset** key to access the **3. Bluetooth Setup** menu.

Manual configuration

You can enable or disable Bluetooth wireless technology through the Network Configuration menu. The **Enable Bluetooth** option provides administration control over Bluetooth wireless technology. The following values are available

- Auto—(default) Bluetooth wireless technology setting received through TFTP configuration
- Yes—Bluetooth wireless technology is enabled on the IP Phone
- No—Bluetooth wireless technology is disabled on the IP Phone

When the IP Phone 1140E firmware is upgraded, or when the IP Phone is received from the manufacturer with the latest firmware, the default power up setting is Auto. When the setting is Auto, the setting received from the TFTP Device Config file controls whether Bluetooth wireless technology is enabled.

When the Bluetooth wireless technology setting is Yes or No, the value received from the TFTP Device Config file is saved but is not used. The Bluetooth wireless technology administration setting is forced enabled, or disabled respectively regardless of the value received in the TFTP Device Config file. If the setting is then changed back to Auto, the saved value takes effect if no further setting is received through the TFTP server.

Procedure 125

Configure the Bluetooth wireless technology administration setting

Step	Action
1	Double-press the Services key.
2	Press 3 on the dialpad to access the Network Configuration menu or use the Up/Down navigation keys to scroll and highlight the Network Configuration option.
3	Use the Right navigation key to navigate to the Enable Bluetooth box. The current setting is displayed.
4	Press Enter to start the edit mode.
5	Use the Down navigation key to open the list.
6	Use the Up/Down navigation keys to scroll and highlight the desired Bluetooth wireless technology mode.
7	Press Enter to select the mode and to close the list.
8	Press Enter to exit the edit mode.
9	Press the Apply&Reset soft key to save the change and to restart the phone.

—End—

The new mode takes affect when the IP Phone restarts. If the administrative control enabled Bluetooth wireless technology on the phone, the item **3. Bluetooth Setup** appears in **1. Preferences** submenu.

After setting administrative control, it is recommended that the Partial Menu Lock feature be activated to prevent users from changing the administration setting. For further information about the Partial Menu Lock feature, see [Appendix "Configuring the Local Tools menu" \(page 455\)](#).

TFTP configuration

Use [Procedure 126 "Enabling Bluetooth wireless technology on the IP Phone 1140E"](#) (page 516) to enable Bluetooth wireless technology on the IP Phone. The IP Phone 1140E is used as an example.

Procedure 126

Enabling Bluetooth wireless technology on the IP Phone 1140E

Step	Action
------	--------

ATTENTION

If the TFTP server is configured and running, skip to [step 5](#) to configure the IP Phone 1140E with the TFTP Server IP address.

- 1 Add the [DEVICE_CONFIG] section to the 1140e.cfg file.
- 2 Create the device configuration file. This file must have the same name as that specified for the FILENAME parameter in the [DEVICE_CONFIG] section of the 1140e.cfg file. See [Figure 74 "Sample of the 1140eDEV.cfg file"](#) (page 516).

Figure 74
Sample of the 1140eDEV.cfg file

```
ENABLE_BT 1
```

- 3 The device configuration file (1140eDEV.cfg) enables Bluetooth wireless technology if ENABLE_BT 1 is present. If ENABLE_BT 0 is present, Bluetooth wireless technology is disabled. [Figure 75 "Sample of the 1140E.cfg file"](#) (page 517) shows an example of the 1140e.cfg file with the FW and the ENABLE_BT line.

It is also possible to use the 1140e.cfg file with only the [DEVICE_CONFIG] section for the control of Bluetooth wireless technology. [Figure 76 "Sample of the DEVICE_CONFIG file with only the \[DEVICE_CONFIG\] section"](#) (page 517) shows an example of the 1140e.cfg file with only the [DEVICE_CONFIG] section.

If only the [DEVICE_CONFIG] version is used, you must add the [FW] section before the BootC FW recovery is used. Otherwise, the BootC FW download fails and the IP Phone reverts to the BootC TPS download screen.

Figure 75
Sample of the 1140E.cfg file

```
[FW]
DOWNLOAD_MODE AUTO
VERSION 0625Cxx
FILENAME 0625Cxx.bin
PROTOCOL TFTP
SERVER_IP 192.168.1.100
SECURITY_MODE 0

[DEVICE_CONFIG]
DOWNLOAD_MODE FORCED
VERSION 000001
FILENAME 1140eDEV.cfg
SERVER_IP 192.168.1.100
```

Figure 76
Sample of the DEVICE_CONFIG file with only the [DEVICE_CONFIG] section

```
[DEVICE_CONFIG]
DOWNLOAD_MODE FORCED
VERSION 000001
FILENAME 1140eDEV.cfg
SERVER_IP 192.168.1.100
```

- 4 Start the TFTP Server. The TFTP Server must be running on the network when the IP Phone 1140E powers up to retrieve the Bluetooth wireless technology administrative control. After you put the 1140e.cfg and the device config file in the TFTP Server directory, ensure the TFTP Server is running then reboot the IP Phone 1140E. For information about TFTP Server configuration, see [Appendix "TFTP Server" \(page 529\)](#).

Once the IP Phone 1140E retrieves the setting when the IP Phone 1140E restarts, it is saved in persistent memory. If the Enable BT setting is set to Auto, then the received value is acted on and Bluetooth wireless technology is either enabled or disabled on the IP Phone 1140E. If the Device Config file with the Enable BT setting is not received for any reason and the Enable Bluetooth mode is set to Auto, then the phone uses the last value received (retrieved from persistent memory).

If administrative control is not retrieved, the previously received value is used. If no value has ever been retrieved, then Bluetooth wireless technology is disabled by default.

If the IP Phone 1140E successfully retrieves the administrative control and enables Bluetooth wireless technology, 3. *Bluetooth Setup* appears in the Preferences menu.

- 5 Configure the IP Phone 1140E with a TFTP Server IP address so the IP Phone can access the TFTP Server.
- 6 Press the **Services** key twice.
- 7 Press 3 on the dialpad to access the **Network Configuration** menu or use the Up/Down navigation keys to scroll and highlight the **Network Configuration** option. Press **Enter**.
- 8 Enter the TFTP IP address in the **TFTP IP** field.
- 9 Press the **Apply&Reset** soft key.

—End—

Table 72 "1140e.cfg field name definitions" (page 518) lists the 1140e.cfg field names and definitions.

Table 72
1140e.cfg field name definitions

Field name	Field value	Definition
[FW]		Section header for firmware download information
DOWNLOAD_MODE	AUTO	Recommended setting. FW is downloaded when the IP Phone FW version is older than the value in the 1140e.cfg file VERSION field.
VERSION	0625Cxx	FW version
FILENAME	0625Cxx.bin	image file name, must match the file name of the FW file
PROTOCOL	TFTP	Download protocol must be TFTP
SERVER_IP	xxx.xxx.xxx.xxx	IP address of the TFTP server that downloads the FILENAME file.
SECURITY_MODE	0	For future use.

Possible reasons Bluetooth wireless technology remains disabled on the IP Phone after bootup

The following are possible reasons Bluetooth wireless technology remains disabled on the IP Phone 1140E after bootup

- The TFTP Server is down or is no longer present on the network.
- Network failure.
- The DEVICE_CONFIG section is missing from the 1140e.cfg file or is present but the specified device config file cannot be accessed, or it can

be accessed but the ENABLE_BT line is either missing, or is present but the value of 1 is missing.

Create the DEVICE CONFIG section and file

The file pointed to by the [DEVICE CONFIG] section contains the parameter, ENABLE_BT. The parameter value is set to 1, which enables Bluetooth wireless technology.

The [DEVICE_CONFIG] section can point to a single file that enables or disables the Bluetooth wireless technology on all phones, or it can point to a device configuration file for specific phones using a wildcard file name to enable the Bluetooth wireless technology for select phones. The configuration files for the specific phones use the IP Phone MAC address as the file name with the .cfg file extension.

Table 73 "[DEVICE_CONFIG] field name definitions" (page 519) lists the [DEVICE_CONFIG] section field names and definitions.

Table 73
[DEVICE_CONFIG] field name definitions

Field name	Field value	Definition
[DEVICE_CONFIG]		Section header for device configuration file information
DOWNLOAD_MODE	FORCED	Recommended setting. The version is ignored and the DEVICE_CONFIG file is always read.
	or	
VERSION	000001	The version of the device config file
FILENAME	1140eDEV.cfg	Device config filename. The file name can be anything. If a file name is specified, the file name is loaded to every IP Phone 1140e.
	or	
	*.cfg	A wildcard file name enables a different setting to be configured for every IP Phone. The IP Phone checks for a file with the MAC address as the file name (for example, 001365FEF1C6.cfg).
SERVER_IP	xxx.xxx.xxx.xxx	The IP address of the TFTP Server that downloads the FILENAME file.

Pairing your headset

Use Procedure 127 "Pairing the Bluetooth wireless technology headset with your IP Phone" (page 520) to pair the Bluetooth wireless technology headset with your IP Phone.

Procedure 127**Pairing the Bluetooth wireless technology headset with your IP Phone**

Step	Action
1	<p>Restart your IP Phone using one of the following methods</p> <ul style="list-style-type: none">• If you are using an AC power adapter, unplug it, wait 10 seconds, and reinsert it.• If you are using POE, unplug the LAN Ethernet cable, wait 10 seconds, and reinsert it.
2	<p>Double-press the Headset key to open the 3. Bluetooth Setup dialog box.</p> <p>The Enable Bluetooth check box is highlighted.</p> <p>If the 3. Bluetooth Setup menu fails to open when you double press the Headset key, Bluetooth wireless technology is not enabled on your phone.</p>
3	<p>Press the Enter key to activate Bluetooth wireless technology.</p> <p>A check mark is displayed to indicate that Bluetooth wireless technology is activated. The message <i>BT Enabled</i> appears at the bottom of the display.</p>
4	<p>Put your Bluetooth wireless technology headset in its pairing or search mode. The procedure for doing this can be different for each wireless headset. See the documentation that accompanies your headset.</p>
5	<p>Search for the headset.</p> <ol style="list-style-type: none">a. Press the Right navigation key twice to highlight the Search button, displayed next to the Search Devices item.b. Press the Enter key. The message <i>Searching...</i> is displayed.c. If the search is successful, a list of Bluetooth wireless technology headsets appears in the Found: box.d. Choose one of the following<ul style="list-style-type: none">• If the search is successful, proceed to step 6.• If the search is not successful, the message <i>Search completed. No device found</i> is displayed. Power off the wireless technology, and repeat step 4 and step 5.
6	<p>Wait for the search to finish or press the Stop soft key to end the search.</p>

- 7 Choose one of the following
- If your headset is displayed as the first item in the Found box, proceed to step 8.
 - If your headset is not displayed as the first item in the Found box, select your headset from the list, as follows
 - a. Press the **Right** navigation key one or more times to highlight the Found: box. Press the **Enter** key to start the edit mode.
 - b. Press the **Down** navigation key to open the list. Press the **Up/Down** navigation keys to scroll and highlight your headset.
 - c. Press the **Enter** key to select the headset and close the list. Press the **Enter** key to exit edit mode.
- 8 Press the **Right** navigation key one or more times to highlight the **Pair** button (next to the Pair Device item) and press the **Enter** key.
- a. A dialog box appears, with the prompt *Enter PIN#*.
 - b. Use the IP Phone dialpad to enter the Bluetooth wireless technology headset PIN and press the **Enter** key.
- Check your headset documentation to find its PIN (sometimes called a passkey). Typically this value is 0000.
- 9 Choose one of the following
- If the headset is successfully paired with your phone, proceed to step 10. To verify that the pairing was successful, ensure that the headset appears in the list next to the Paired: item. If pairing is successful, the message *Pair completed* also appears at the bottom of the screen.
 - If the headset is not successfully paired with your phone, an error message appears at the bottom of the screen. If an error message appears
 - Confirm that the wireless headset is still in search/pair mode. For example, on the GN Netcom GN 6210 headset the blue LED should still be lighted when the pairing operation starts.
 - If the headset timed out and exited search/pairing mode, put the headset in pairing mode, as discussed in step 4, and repeat step 8.
 - Check that you are using the correct PIN and repeat step 8.
- 10 Choose one of the following
- If your headset is displayed as the first item in the Paired box, proceed to step 11.

- If more than one device is paired, you may need to navigate to the one you want, as follows
 - Press the **Right** navigation key one or more times to highlight the item in the Paired box. Press the **Enter** key to start the edit mode.
 - Press the **Up/Down** navigation keys to open the list. Press the **Up/Down** navigation key to scroll in the list and highlight your headset.
 - Press the **Enter** key to select the headset and close the list. Press the **Enter** key to exit edit mode.

11 Choose one of the following

- If only one headset is paired, proceed to [step 12](#).
- If more than one wireless headset is paired, the first headset paired is automatically made the active device.

To make a different headset active, press the **Right** navigation key one or more times to highlight the Set button (next to the Set Active Device item). Press the **Enter** key.

The message *Set active: <device name>* appears. This means the headset named is now the active wireless headset and is used when you press the headset key.

12 Press the **Exit** soft key to exit to the main display. Changes are saved automatically.

Paired headset information is saved and restored when a reboot of the IP Phone occurs; therefore, the active wireless headset remains paired and active.

It is not recommended to pair more than one headset of the same model because identical names will appear in the Paired list.

—End—

Dual Pairing Headsets

Take special care when you use a dual pairing type of Bluetooth wireless technology headset. This headset can be paired to its base as well as to the IP Phone 1140E and IP Phone 1150E.

If the headset is paired to both, the IP Phone is the second device. When you press the headset telephone key and you hear a single tone, the headset is active for a call from the desktop IP Phone base.

To use the headset with the IP Phone, press and hold the headset telephone key for 1 second. You hear a double beep. The headset is active with the IP Phone.

If the base is powered off, the headset is only paired to the IP Phone. Press the headset telephone key to connect to the IP Phone.

Unless a need exists to dual-pair a headset, the operation of the headset with the IP Phone is simpler if the headset is only used with its charging-only base. The desktop IP Phone base should be powered off if it is not in use.

Interaction with wired headsets

If you connect a Bluetooth wireless technology headset and a wired handset to the same IP Phone, the two interact as follows

- If no wireless headset is paired, the wired headset works as normal. Likewise, if a wireless headset is paired with an IP Phone but is not in range, the wired headset works as normal.
- If the Use BT Headset check box is selected, the Bluetooth wireless technology headset is used as the phone headset.

The Bluetooth wireless technology headset can work only within range of the IP Phone; as a wireless headset approaches the edge of its radio range, the audio quality degrades and radio interference noise increases. When the wireless headset is in connecting range, the Headset key controls the headset, even if a wired headset is attached. If a Bluetooth wireless technology headset moves out of connecting range, a special beep sounds in the headset to indicate that the connection is lost.

When you do not want to use Bluetooth wireless technology

If a Bluetooth wireless technology headset is connected, and you want to use the wired headset, you can switch between the wireless headset and the wired headset. It is not necessary to unpair or disable Bluetooth wireless technology. You can switch between a wired headset and back again when the phone is idle or during an active call.

Use [Procedure 128 "Switching between a wired headset and wireless headset" \(page 523\)](#) to switch between a wired headset and a wireless headset.

Procedure 128

Switching between a wired headset and wireless headset

Step	Action
1	Double-press the Headset key to open the 3. Bluetooth Setup dialog box.

- 2 Press the **Left/Right** navigation key to select the **Use BT headset** item.
A check mark indicates that the wireless headset is used. This option is on (✓) by default.
- 3 To switch between a wired headset and a wireless headset, do one of the following
 - Press the **Enter** key to clear the check box and to use the wired headset.
 - Press the **Enter** key to select the check box and to use the wireless headset.
- 4 Press the **Exit** soft key to exit to the main display.

—End—

Use [Procedure 129 "Unpairing a wireless headset" \(page 524\)](#) to unpair the Bluetooth wireless technology headset.

Procedure 129

Unpairing a wireless headset

Step	Action
1	Double-press the Headset key to open the 3. Bluetooth Setup dialog box.
2	Press the Right navigation key to select the Paired: item.
3	Choose one of the following <ul style="list-style-type: none"> • If your headset is displayed in the Paired box, proceed to step 5. • If more than one device is paired, and your headset is not already displayed in the Paired box, do the following <ul style="list-style-type: none"> — Press the Right navigation key one or more times to highlight the Paired: box. Press the Enter key to open edit mode. — Press the Up/Down navigation keys to open the list. Press the Up/Down navigations key to scroll in the list and highlight your headset. — Press the Enter key to select the headset and close the box. Press the Enter key to exit edit mode.
4	Press the Right navigation key one or more times to highlight the UnPair button (next to the UnPair Device item).

- 5** Press the **Enter** key.

Your Bluetooth wireless technology headset is unpaired and removed from the Paired: item list.
- 6** Press the **Exit** soft key to exit to the main display.

Your Bluetooth wireless technology headset is no longer paired with your phone, and the wired headset is used. To use the Bluetooth wireless technology headset again, you must perform the pairing and activation procedure.

—End—

Appendix H

Language enhancement

Contents

This section contains the following topics:

- "Description" (page 527)
- "Expansion Module for IP Phone 1100 Series font support" (page 528)

Description

To support new languages with complex fonts, CS 1000 Release 5.0 introduces the following language enhancements for the IP Phone 2007, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E

- UNISim font messages interpreted as UTF-8— enables the Call Server to easily display complex fonts, such as Arabic, Simplified Chinese, Traditional Chinese, Greek, Hebrew, Japanese, and Korean on an IP Phone.
- Support for TFTP Server—an extension of the existing configuration file is used to download fonts as needed into the IP Phone.
- Synchronization of the display language between the Call Server and the IP Phone—local prompts on the IP Phone and text from the Call Server are displayed in the same language.

UTF-8 character encoding

UTF-8 is used as character encoding between the Call Server and the IP Phone. This must be enabled on the Call Server in order for the fonts to be downloaded. After the Call Server has downloaded the appropriate fonts, the IP Phone can display all languages for which it has appropriate character sets. Although the IP Phone supports the languages for which it has appropriate character sets, only one language can be displayed at a time.

TFTP Server support

A configuration file is used to download font files, as needed, to the IP Phone using a TFTP Server. After the font files are downloaded to the IP Phone, the configuration file creates a mapping, so the IP Phone knows how and when to use the font.

Synchronizing the language

If the Call Server initiates a language change, the IP Phone changes its local prompts to match the specified language on the Call Server. If the IP Phone user initiates a language change using the Local Tools menu, the Call Server changes its local prompts to match the specified language on the IP Phone. If the Call Server selects a language which the IP Phone does not support, the local prompts default to English.

For information about downloading and configuring fonts see [Appendix "TFTP Server" \(page 529\)](#).

Expansion Module for IP Phone 1100 Series font support

The Expansion Module for IP Phone 1100 Series (Expansion Module) text is rendered by the IP Phone; therefore, the selected language and font mappings on the Expansion Module mirror the selected language and font mappings on the IP Phone.

Appendix I

TFTP Server

Contents

This section contains the following topics:

- "Introduction" (page 529)
- "TFTP Server planning" (page 529)
- "Updating IP Phones firmware" (page 531)
- "Downloading and configuring fonts" (page 540)

Introduction

A Trivial File Transfer Protocol (TFTP) Server may be required in an IP Telephony system to distribute firmware to IP Phones. The TFTP Server can reside on a subnet other than the Call Server and can be located on either side of the firewall.

TFTP Server planning



CAUTION

TFTP firmware download does not work when the IP Audio Conference Phone 2033 is behind a NAT Server.

The TFTP Server holds the firmware for updating the IP Phones. Assuming the IP address for the TFTP Server has been configured on the IP Phone, each time the IP Phone is powered on, rebooted, or is manually reset, the IP Phone checks the version of firmware against the version of firmware on the TFTP Server. If the versions are different, the IP Phone downloads the new firmware from the TFTP Server.

The following information must be considered when planning for a TFTP Server:

- The process for the IP Phone to check the version of firmware against the firmware on the TFTP Server takes a few seconds for a quiet network.
- The IP Phone attempts to connect to the TFTP Server. If the TFTP Server is offline, unreachable, or no connection is made, the IP Phone uses its existing version.
- The firmware downloading process takes about 30 seconds.
- The TFTP Server must be capable of supporting multiple TFTP sessions.
- When the IP Phone makes a TFTP request, it uses filenames without a full path name. Therefore, firmware updates for the IP Phones must be installed on the root directory of the TFTP Server.

When the firmware is uploaded to the TFTP Server, the files must be unzipped. Allow time for the TFTP Server to refresh. Monitor the TFTP Server for any errors. The TFTP Server can be located anywhere on the network if the IP Phones have the subnet mask and default IP gateway configured correctly. However, the IP Phone expects a response within two seconds to any TFTP Server request. Therefore, the TFTP Server should not be located, for example, at the other end of a slow WAN link.

If too many IP Phones attempt to download new software simultaneously, it can cause the downloads to slow down or return error messages. To reduce the number of retries and error messages, manage the download process by staggering the times the IP Phones download the firmware.

Nortel has tested the following TFTP Servers. They are listed in order of preference:

- Nortel TFTP Server (ONMS application)
- 3COM TFTP Server
- Pumpkin TFTP Server

Pre-download checklist

Ensure the following requirements are met before downloading firmware:

- A LAN must be properly configured and operational.
- The Nortel Telephony system must be connected to the network and completely operational.
- A TFTP Server must be available on the network in order to load the appropriate firmware in the IP Phones.

Updating IP Phones firmware

The latest IP Phone firmware files are found on the Nortel Web site. When the firmware is uploaded to the TFTP Server, the files must be unzipped. The zip file contains a configuration file (.cfg) and a README text file (.txt) with instructions to set up the TFTP Server and to modify the configuration file correctly so that the IP Phone downloads the firmware.

For future firmware upgrades, update the firmware file which is stored on the TFTP Server. Each time the IP Phone is powered on, it checks with the TFTP Server to ensure it has the proper firmware version, and it downloads the new software, if necessary.

Use [Procedure 130 "Updating the IP Phones firmware" \(page 531\)](#) to update the IP Phone firmware for IP Phone 2001, IP Phone 2002, IP Phone 2004, and IP Audio Conference Phone 2033.

For information about updating the firmware for the IP Phone 2007, see ["Updating the IP Phone 2007 firmware" \(page 532\)](#). For information about updating the firmware for the IP Phone 1110, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E, see [Procedure 132 "Updating the firmware" \(page 536\)](#).

ATTENTION

Nortel recommends that the user ends an active call before performing firmware upgrade. Otherwise results may be unpredictable.

Procedure 130

Updating the IP Phones firmware

Step	Action
1	Download the latest IP Phones firmware from the Nortel Web site.
2	Load the latest version of the IP Phones firmware, place it on the TFTP Server, and unzip the files. Ensure the TFTP Server is started. The files required are: <ul style="list-style-type: none"> • configuration file (i2033.cfg, for example) • firmware binary file (2310S10.bin, for example)
3	If you statically assign IP addresses, ensure that the IP address, TFTP Server IP Address, Subnet Mask, and Default Gateway information are accurate. If you are using a DHCP Server, ensure the DHCP options are configured.
4	Enter the TFTP Server IP address in the configuration menu, and reboot the IP Phone.

—End—

Updating the IP Phone 2007 firmware

The IP Phone 2007 can perform TFTP firmware upgrade from within the **Tools** menu. This method requires the TFTP Server to store the following files in the root directory:

- i2007.cfg – downloading script file
- 0625Cxx.bin – firmware image file

i2007.img is the name of the firmware file by default, but the location and the name of the firmware image file being downloaded is specified in the i2007.cfg file and can be any name. The name of the firmware image file can be specified in relative path name notation (for example, /subfolder/name.ext or name.ext).

Table 74 "Fields in the TFTP configuration file" (page 532) describes the fields in the configuration file on the TFTP Server. The download mode can be set to AUTO or FORCED. It is recommended that you set DOWNLOAD_MODE to AUTO.

Table 74
Fields in the TFTP configuration file

Field Name	Field Value	Descriptions
DOWNLOAD_MODE	AUTO	Recommended setting. The application looks at the version and downloads the FW if it is a newer version than what is on the phone.
	FORCED	The version of firmware is ignored. The firmware is always downloaded.
VERSION	0625Cxx	The version string compared to what is on the phone.
FILENAME	0625Cxx.bin	Image file name. Must match the file name of the actual IP Phone FW file.
PROTOCOL	TFTP	Download protocol. Must be TFTP.
SERVER_IP	xxx.xxx.xxx.xxx	IP Address of the TFTP server in decimal.
SECURITY_MODE	0	For future use.

Use Procedure 131 "Downloading the firmware for the IP Phone 2007" (page 533) to upgrade the firmware for the IP Phone 2007.

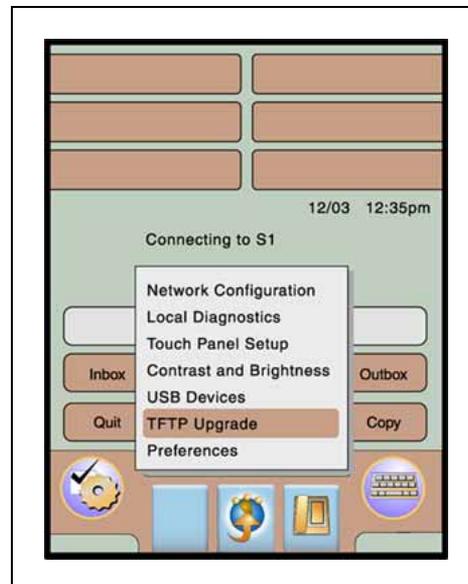
Procedure 131**Downloading the firmware for the IP Phone 2007****Step Action****ATTENTION**

Nortel recommends that the user ends an active call before performing firmware upgrade otherwise results may be unpredictable.

- 1 Download the latest IP Phones firmware from the Nortel Web site.
- 2 Load the latest version of the IP Phones firmware and place it on the TFTP Server. Ensure the TFTP Server is started.
- 3 Select the TFTP Upgrade option in the Service > **option** > **Tools** menu.

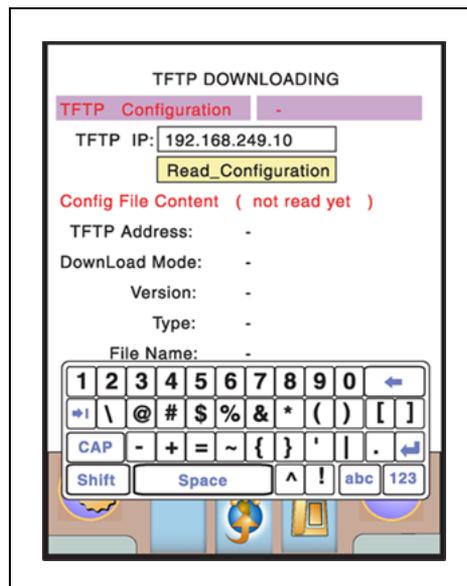
See [Figure 77 "TFTP Upgrade menu option"](#) (page 533).

Figure 77
TFTP Upgrade menu option



- 4 Enter the IP address for the TFTP Server in the **TFTP IP:** edit box. The dialpad is used to enter the IP address by substituting star (*) as dot (.). See [Figure 78 "TFTP Server IP address screen"](#) (page 534).

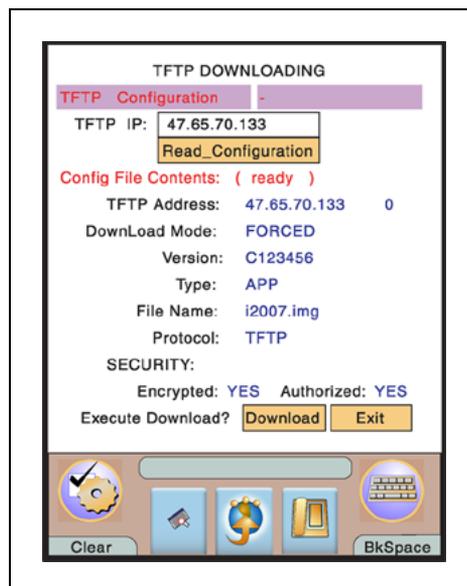
Figure 78
TFTP Server IP address screen



- 5 Tap on the **Read_Configuration** button.

The IP Phone reads the configuration file information from the TFTP Server and displays the image information in the dialog box. Check your network connection if the phone cannot read the configuration file. See [Figure 79 "Configuration file information"](#) (page 534).

Figure 79
Configuration file information



- 6 Press the **Download** button to start the TFTP Server.

The phone goes blank briefly. Then the message *Starting TFTP download* appears on the screen. Then the firmware is downloaded. The message *Writing firmware to Flash ROM* appears on the screen while the firmware is written to Flash memory. The IP Phone 2007 resets and the application starts.

—End—

Updating the firmware for IP Phone 1110, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E

Automatic TFTP download at bootup

If a TFTP IP address has been configured and a firmware upgrade is available on the server when the phone restarts, the phone executes the automatic TFTP download. This method requires the TFTP Server to store the .cfg and 0625Cxx.bin files for the IP Phone in the root directory.

For example, the IP Phone 1110, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E require the following files:

- 1110.cfg
0625Cxx.bin
- 1120e.cfg
0625Cxx.bin
- 1140e.cfg
0625Cxx.bin
- 1150e.cfg
0625Cxx.bin

0625Cxx.bin is the name of the firmware file by default, but the location and the name of the firmware image file being downloaded is specified in .cfg and can be any name. The name of the firmware image file can be specified in relative path name notation (for example, /subfolder/name.ext or name.ext).

[Table 75 "Fields in the TFTP configuration file" \(page 535\)](#) describes the fields in the configuration file on the TFTP Server. The download mode can be set to AUTO or FORCED. It is recommended that you set DOWNLOAD_MODE to AUTO.

Table 75
Fields in the TFTP configuration file

Field Name	Field Value	Descriptions
[FW]		Section header for firmware download info

Field Name	Field Value	Descriptions
DOWNLOAD_MODE	AUTO	Recommended setting. The application looks at the version and downloads the FW if it is a newer version than what is on the phone.
	FORCED	The version of firmware is ignored. The firmware is always downloaded.
VERSION	0625Cxx	The version string compared to what is on the phone.
FILENAME	0625Cxx.bin	Image file name. Must match the file name of the actual IP Phone FW file.
PROTOCOL	TFTP	Download protocol. Must be TFTP.
SERVER_IP	xxx.xxx.xxx.xxx	IP Address of the TFTP server in decimal.
SECURITY_MODE	0	For future use.

Use [Procedure 132 "Updating the firmware" \(page 536\)](#) to upgrade the firmware for the IP Phone 1110, IP Phone 1120E, IP 1140E, and IP Phone 1150E using automatic TFTP download during bootup.

Procedure 132 Updating the firmware

Step	Action
------	--------

1	Use one of the three methods to configure the TFTP Server address:
---	--

- Access the Network Configuration menu. Enter the address at the TFTP IP prompt. Press the **ApplyandReset** soft key to save the change.
- Enter the address in the BootC menu. See "[Manual TFTP Download from BootC Procedure](#)" (page 537).

BootC idz_8958 is not available for Expansion Modules for IP Phones 1100 Series.

- Enter the IP address in the TFTP IP address field retrieved by the DHCP Server.

2	Restart the phone.
---	--------------------

After the IP Phone starts and begins to run the latest version of firmware, the 1110.cfg, 1120e.cfg, 1140e.cfg, and 1150e.cfg files are downloaded from the TFTP Server. After the .cfg file is retrieved, the DOWNLOAD_MODE and VERSION fields are checked. If necessary, the firmware file is transferred to the phone using TFTP. The display shows the message *[FW] reading...* If successful, the display shows *[FW] writing...* and the blue LED starts to flash. After

the FW image is written to the phone, the message *[FW] finished* displays, the blue LED stops flashing, and the phone resets. The phone registers to the TPS with the new FW version.

—End—

Manual TFTP Download from BootC Procedure

This method of upgrading the firmware is normally used only when you need to force the phone to restore an older firmware version. To use this method, the firmware must be placed on the TFTP Server, and you must manually configure the phone to point to that TFTP Server. The BootC firmware carries out the upgrade. To initiate the firmware download task, BootC must be triggered to run.

You can create the configuration file with a default file name, such as 1140E.img so you do not have to change the file name each time a new IP Phone 1140E firmware load is released. However, if you take this approach, be sure to rename the released firmware file (for example, 0625Cxx.bin) to the default file name when the new firmware file is copied into the TFTP Server root directory and to update the VERSION string in the configuration file.

After the configuration file and the image file are in the TFTP Server root directory, use [Procedure 133 "Upgrading the firmware using BootC"](#) (page 537) to upgrade the firmware using BootC.

Procedure 133

Upgrading the firmware using BootC

Step	Action	
1	Hold down the [Up] and [2] keys, and while doing so, repower the phone. When the phone restarts, it loads and runs BootC instead of the application. When the Msg Waiting LEDs go off, you can release the [Up] and [2] keys.	
2	The following text menu on a white background appears:	
<table border="1" style="margin: auto;"> <tr> <td style="text-align: center;"> 11x0 IP Phone Manual Configuration Nortel </td> </tr> </table>		11x0 IP Phone Manual Configuration Nortel
11x0 IP Phone Manual Configuration Nortel		
If you do not see this message, you are in the wrong menu. Repeat step 1. If BootC is damaged from a power reset, hold down the [Up] and [3] keys to use the backup BootC.		
3	When Nortel appears on the screen, press the soft keys 1,2,3,4 in sequence (left to right). BootC goes to manual configuration. If	

you miss this step, and the phone begins to register to the TPS, repeat step 1.

- 4 Follow the prompts to configure DHCP and other IP parameters or, if DHCP and other parameters are already configured, just continue pressing the 1 soft key or OK. The soft keys functions are listed below:
 - soft key 1 (below the LCD) is OK
 - soft key 2 is BackSpace
 - soft key 3 is Clear
 - soft key 4 is Cancel
- 5 When prompted: *TFTP Dwnld? (0-No, 1-Yes):0*,
 - Press soft key 2 (BKSpace) to clear the 0 (No).
 - Press 1 on the dialpad, then press soft key 1 (OK).
- 6 When prompted: *TFTP IP xxx.xxx.xxx.xxx*,
 - If the IP address is correct for the TFTP server, press soft key 1 (OK). After the TFTP address is entered the first time, it is presented the next time you enter the menu.
 - If the IP address is incorrect, press soft key 2 (Clear) to erase the address shown and enter a new address. Press the asterisk (*) key to enter a period (.) in the IP address. You can also use backspace key to erase part of the address or correct errors by pressing soft key 1 (BKSpace). When the address is correct, press soft key 1 (OK).
- 7 The phone reads the configuration file from the TFTP server, extracts the Server_IP and Filename fields, and attempts to download the file. The display shows the message *[FW] reading...*
- 8 The display shows *[FW] writing...* and the blue LED starts to flash.
- 9 After the FW image is written to the phone, the message *[FW] finished* is displayed, the blue LED stops flashing, and the phone resets.

The phone registers to the TPS with the new FW version.

If the TFTP Server, specified by the TFTP IP address entered during configuration, is unreachable or down, the IP Phone attempts to register to the TPS to perform a firmware download. If the IP Phone does not register to the TPS, the IP Phone does not work. Check the TFTP IP address and the state of the TFTP Server, then reboot the IP Phone.

- 10 If the IP Phone remains in this condition because no TPS FW download occurs, check the TFTP IP address and the state of the TFTP Server, then restart the IP Phone.

—End—

Expansion Module for IP Phone 1100 Series

The Expansion Module for IP Phone 1100 Series (Expansion Module) uses the same TFTP Server configuration file method as the IP Phone 1120E, IP Phone 1140E, and the IP Phone 1150E.

Table 76 "Fields in the TFTP configuration file for the Expansion Module" (page 539) describes the fields in the configuration file on the TFTP Server. The section [GEM FW] indicates the firmware is for the Expansion Module. Set the download mode to AUTO or FORCED. It is recommended that you set DOWNLOAD_MODE to AUTO.

Table 76
Fields in the TFTP configuration file for the Expansion Module

Field Name	Field Value	Descriptions
[GEM FW]		Section header for the Expansion Module firmware download information.
DOWNLOAD_MODE	AUTO	Recommended setting. The application looks at the version and downloads the FW if it is a newer version than the one on the phone.
	FORCED	The version of firmware is ignored. The firmware is always downloaded.
VERSION		The version string compared to the one on the phone.
FILENAME		Image file name. This name must match the file name of the actual IP Phone FW file.
PROTOCOL	TFTP	Download protocol. This must be TFTP.
SERVER_IP	xxx.xxx.xxx.xxx	IP Address of the TFTP server in decimal.
SECURITY_MODE	0	For future use.

After the IP Phone downloads the firmware from the TFTP Server, the firmware is upgraded for any attached Expansion Modules, one at a time. The Expansion Module verifies that the firmware was downloaded and saved successfully before the IP Phone initiates the firmware download to the next attached Expansion Module. If any errors occur, which prevent

the firmware from downloading or saving properly, the Expansion Module reverts to the factory installed firmware. This version of firmware is always available in case the downloaded firmware is unusable.

Downloading and configuring fonts

The font files are downloaded as needed using the same TFTP Server configuration file method as IP Phone 2007, IP Phone 1120E, IP Phone 1140E, and IP Phone 1150E.

The IP Phone downloads the required files specified in the configuration file, as necessary. [Table 77 "Fields in the TFTP configuration file for downloadable fonts" \(page 540\)](#) describes the fields in the configuration file on the TFTP Server for downloadable fonts. The section [FONTxx] indicates the font file. Set the download mode to AUTO or FORCED. Nortel recommends that you set DOWNLOAD_MODE to AUTO.

Table 77
Fields in the TFTP configuration file for downloadable fonts

Field Name	Field Value	Description
[FONTxx]		Section header for the font file, which contains font information, including the optional download parameters, versions, and how to use the font after it is downloaded. Only [FONT01] to [FONT10] are supported.
DOWNLOAD_MODE	AUTO	Recommended setting. The application looks at the version and downloads the font if it is a newer version than the one on the phone.
	FORCED	The version of the font is ignored. The configuration file is always downloaded.
PROTOCOL	TFTP	Download protocol. Must be TFTP.
SERVER_IP	xxx.xxx.xxx.xxx	IP Address of the TFTP server in decimal.
SECURITY_MODE	0	For future use.
FILENAME		Image file name. Must match the file name of the actual IP Phone FW file.
ALIAS		Enables the font to have a different name in the IP Phone file system than the one on the Call Server.
VERSION		The version string compared to what is on the phone.

Field Name	Field Value	Description
FONTLANG		<p>Configuration command that defines the language codes for which a font is used.</p> <p>FONTLANG = languagelist Where: languagelist is a comma separated list of ISO 639-2/RFC 3066 codes. See the Display Manager Assign IT Language UNISim message for details on language codes.</p>
MAP		<p>Configuration command that defines how the font is mapped in the Unicode character set.</p> <p>MAP xx xx xx xx xx xx xx xx xx xx Where: xx...xx = 10 hex bytes defining the Unicode ranges for a font in the same format as the IT Character Set Report.</p>

Figure 80
Sample of the font configuration file

```

[FONT01]
DOWNLOAD_MODE AUTO
PROTOCOL TFTP
SERVER_IP 47.65.100.100
SERVER_PORT 7500
SECURITY MODE 0
FILENAME san_950.ccc
ALIAS chinese.ccc
VERSION 00010001
FONTMAPPING ulUnicodeRange=00 00 00 00 00 40- EF 28 32 00 00
00 00 00 00 00; LanguageCode=zu-Hant

[LANGUAGE]
DOWNLOAD_MODE AUTO
PROTOCOL TFTP
SERVER_IP 47.65.100.100
SERVER_PORT 7500
SECURITY MODE 0
VERSION 00010001
FILENAME zu_Hant.lgn
FILENAME jap.lng
    
```

For information about downloading the font file from the Nortel Web site, see *IP Line Fundamentals (NN43100-500)*.

Procedure 134
Downloading a font file

Step Action

1 The version number is compared to the version number of the file (for example, chinese.ccc) in the file system, if it exists. See [Figure 80 "Sample of the font configuration file"](#) (page 541).

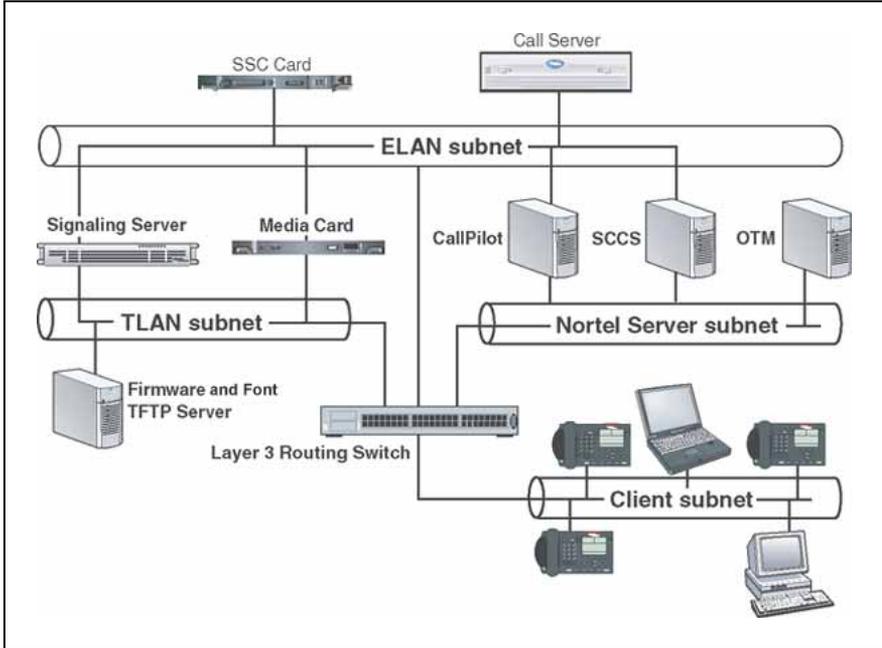
2 If the file does not exist in the file system, or if the version is older than the VERSION specified (for example, 1.1), then the IP Phone downloads the font from the TFTP Server.

As the [FONTxx] sections are processed, the FONTLANG configuration command is also processed. This command defines the language codes for which a font is used. The MAP configuration command defines how the font is mapped in the Unicode character set. This command maps the font (for example, chinese.ccc) to the UNICODE pages (for example, 0x3000-0xE000 and 0xF100) and associates the font to the Traditional Chinese language code (for example, zu-Hant). The [LANGUAGE] section specifies the prompt files for the IP Phone. The prompt file is only downloaded to the file system if the version is higher than the existing prompt version, or if DOWNLOAD_MODE is set to FORCED. The IP Phone firmware includes the base set of prompt files so downloads are not necessary for languages natively supported by the firmware.

3 After the required fonts are downloaded from the TFTP Server, the IP Phone resets and registers to the TPS.

—End—

Figure 81
TFTP Server on a network



Appendix J

IP Phone context-sensitive soft keys

Table 78 "IP Phone context-sensitive soft keys" (page 545) describes the IP Phone feature assignment for each of the dedicated keys. Use LD 11 to program keys 16 to 26 on the IP Phones.

If you attempt to configure anything other than the permitted response, the Call Server generates an error code.

Table 78
IP Phone context-sensitive soft keys

Key number	Response	Description
Key 16	MWK	Message Waiting key
Key 17	NUL	Removes function or feature from key
	TRN	Call Transfer key
Key 18	NUL	Removes function or feature from key
	A03	Three-party conference key
	A06	Six-party conference key
Key 19	NUL	Removes function or feature from key
	CFW	Call Forward key
Key 20	NUL	Removes function or feature from key
	RGA	Ring Again key
	NUL	Removes function or feature from key

Key number	Response	Description
Key 21	PRK	Call Park key
Key 22	NUL	Removes function or feature from key
	RNP	Ringing Number Pickup key
Key 23	NUL	Removes function or feature from key
	SCU	Speed Call User
	SSU	System Speed Call User
	SCC	Speed Call Controller
Key 24	SSC	System Speed Call Controller
	NUL	Removes function or feature from key
	PRS	Privacy Release key
Key 25	NUL	Removes function or feature from key
	CHG	Charge Account key
Key 26	NUL	Removes function or feature from key
	CPN	Calling Party Number key
	NUL	Removes function or feature from key

Appendix K

Call features

Table 79 "IP Phone supported call features" (page 547) shows a list of supported call features for the IP Phones.

Table 79
IP Phone supported call features

Feature	Description
AAG	ACD Answer Agent
ACNT	ACD Account
ADL	Autodial
AGT	ACD Agent
AMG	ACD Answer Emergency
A03	Three party conference
A06	Six party conference
ARC	Attendant recall
ASP	ACD Call Supervisor
AWT	ACD Call Waiting Time
AWC	ACD Calls Waiting
BFS	Busy Forward Status
CA	No hold conference - autodial
CCOS	Controlled Class of Service
CFW	Call Forward
CHG	Charge Account
CLID	Caller ID and called ID
CPN	Calling Party Number
CS	No hold conference - speed call
CSD	Conferee Selectable Display

Feature	Description
CWT	Call Waiting
DAG	ACD Display Agents
DSP	Display
DIG	Display Intercom Group
DPU	Directed Call Pickup
DRC	DID Route Control
DWC	ACD Display Call Waiting Calls
EOV	Enhanced Override
EMG	ACD Emergency
ENI	ACD Enable Inflow
FLH	BCS Flash
FOV	Flash Override
GHD	Group Hunt Deactivate
GRC	Group Call
GPU	Group Pickup
HOT	Hotline
ICF	Internal Call Forward
IMM	BCS Immediate
LNR	Last Number Redial
MCK	Message Cancellation Key
MIK	Message Indication Key
MRK	Message Registration Key
MSB	Make Set Busy
MWK	Message Waiting Key
NHC	No Hold Conference
NKL	Notification Key Lamp
NRD	Not Ready
NSVC	ACD Night Service
OBV	ACD Observe Agent
OSN	Onsite Notification
OVB	Overflow position Busy
OVR	Override
PRK	Call Park
PRS	Privacy Release

Feature	Description
PRY	Priority
RAG	ACD Agent Call
RCK	Ringing Change Key
RD.	Redial Stored Number
RGA	Ring Again
RLS	Release
RANK	Room Status Key
REMARK	Remote Message Waiting Key
RNP	Ringing Number Pickup
RPAG	Radio Page
SCC	Speed Call Controller
SCU	Speed Call User
SIG	Signal
SSC	Speed System Call Controller
SSU	System Speed call User
THF	Centrex Switch Hook Flash
TRC	Malicious Call Trace
TRN	Call Transfer
USR	User Selectable Call Redirection
UST	User Status
VCC	Voice Call
WUK	Wake Up Key
XMWK	Multiple DN Message Waiting

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Nortel Communication Server 1000

IP Phones Fundamentals

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Publication: NN43001-368
Document status: Standard
Document version: 01.01
Document date: 30 May 2007

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