Dialogic PCI Linecard Installation and Replacement

This document explains how to install or replace one or more Dialogic® D/41EPCI™, D/120JCT-LS™, or D/240PCI-T1™ linecards in a OneBox® platform. It also explains how to install Dialogic System Software versions 2, 3.3, and SR5.01. The information in this document pertains to platforms running version 1.1 or later of OneBox.

We recommend that you read this entire document before disassembling the hardware.

IMPORTANT

Hardware conflicts and configuration issues can occur between hardware devices installed in a computer platform. Because Ericsson sells Dialogic PCI linecards as a kit for installation in computer platforms that we have not tested, we cannot guarantee the compatibility of these cards in your computer platform. Ericsson will offer troubleshooting advice and assistance to the best of its knowledge and ability. However, you are ultimately responsible for resolving all hardware conflicts and configuration issues.

Dialogic PCI linecards cannot be used in a computer platform that also contains Dialogic ISA linecards (includes D/41D, D/41ESC, and D/160SC-LS). If ISA linecards are currently installed in the platform, they must be removed prior to installing the PCI linecards. Dialogic PCI linecards *can* be used in conjunction with all Brooktrout™ fax cards.

This document does not discuss how to install or configure the Dialogic D/4PCI linecard. Although we sell this card for use in telephony server platforms, it lacks the telephony bus connections to be fully compatible with the other linecards that we support. For information on installing and configuring D/4PCI linecards, please see the spare parts document *Dialogic D/4PCI Linecard Installation and Replacement*.

Before You Begin

Review this section before performing any of the procedures in this document. This section provides important information about electrostatic discharge and the tools and equipment required to complete the installation.

Electrostatic Discharge (ESD) Warning

Computer components are extremely sensitive to electro-static discharge (ESD). You *must* wear an anti-static wrist strap and install the linecard at an ESD-safe workstation. Do not open the static-protective bag until necessary. Before removing the linecard from the static-protective bag, touch the bag to a grounded, unpainted metal surface for at least two seconds (this drains the static electricity from the bag and from your body). Turn off and unplug your computer before removing the case.

Gathering Tools and Equipment

Before you begin disassembling the OneBox platform, verify that you have the following required tools and equipment:

- OneBox Telephony Server program CD-ROM

- Dialogic System Software program SR5.01 CD-ROM (if applicable)

- One or more Dialogic PCI linecards (D/41EPCI, D/120JCT-LS, or D/240PCI-T1)

- CTbus cable to connect multiple PCI cards

- New feature key diskette (if the total number of ports available after the addition of new linecards exceeds the number of ports for which you are currently licensed)

- #2 Phillips screwdriver

- Linecord adapters, if necessary

- If you are installing a D/240PCI-T1 linecard, the following additional hardware:

  - Channel Service Unit (CSU), may be integrated into the telephone system (switch)
  - T-1 line–to–CSU cable
  - CSU–to–D/240PCI-T1 cable

  Refer to the "Cabling Dialogic D/240PCI-T1 Linecards to the Telephone System" section for additional information.

Technical Specifications of Dialogic PCI Linecards

Tables 1–3 list the technical specifications for the three Dialogic PCI linecards approved for use with OneBox:

- D/41EPCI 4-port linecard

- D/120JCT-LS 12-port linecard

- D/240PCI-T1 24-channel T-1 card

Figures 1 through 3 show the general layouts of these linecards.

Your local telephone company may require some of these specifications. For example, in the United States, some telephone companies require an FCC registration number if the linecard is connected directly to central office (CO) lines. Contact your local telephone company for its requirements.

Table 1: D/41EPCI technical specifications

Feature	*Specification*
Number of ports	1–4; the OneBox port assignment is determined by the card's linecard identification number
Dialing	DTMF
FCC registration number	EBZUSA-75385-VM-T
Analog network interface	On board loop-start interface circuits
Voice coding	PCM
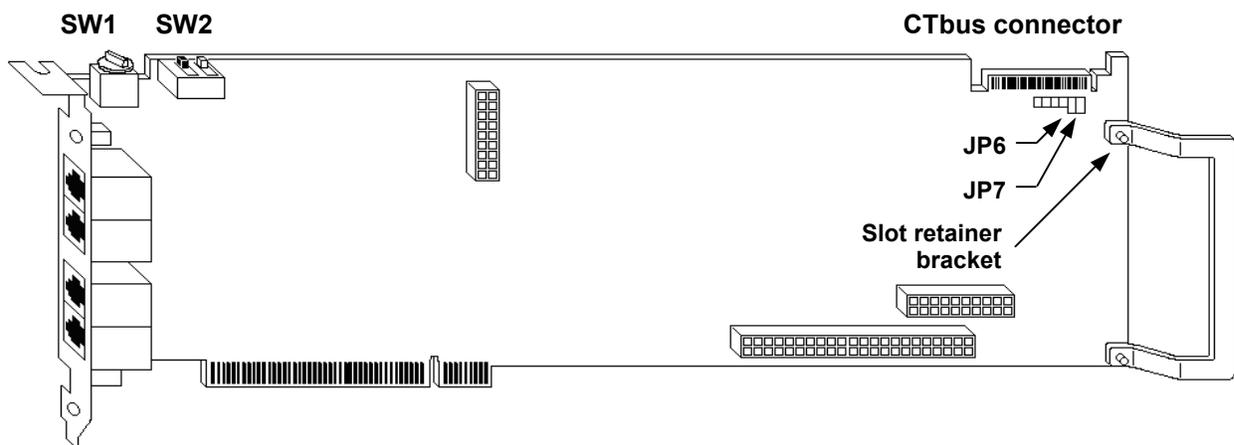
Figure 1. Layout of the D/41EPCI linecard

Table 2: D/120JCT-LS technical specifications

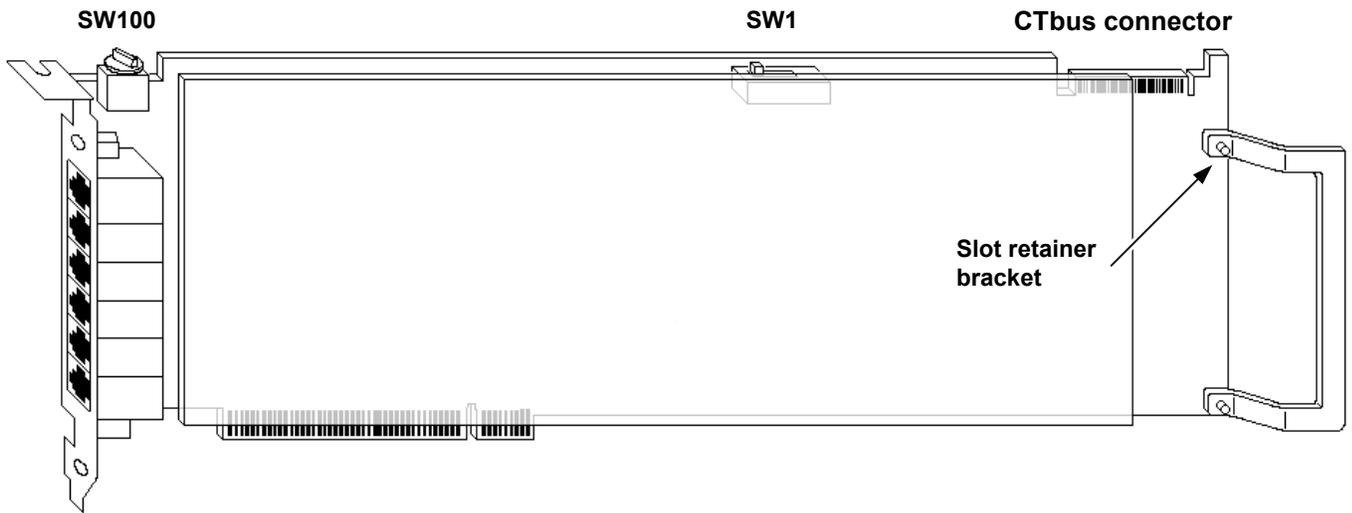| Feature	Specification
Number of ports	1–12; the OneBox port assignment is determined by the card's linecard identification number
Dialing	DTMF
FCC registration number	EBZUSA-34827-KX-N
Analog network interface	On board loop-start interface circuits
Voice coding	PCM

SW100   SW1   CTbus connector

Slot retainer
bracket

Figure 2. Layout of the D/120JCT-LS linecard

Table 3: D/240PCI-T1 technical specifications

| *Feature*	*Specification*
Channelization (channel order)	1–24; the correlation between channelization and OneBox ports is determined by the card's linecard identification number
Dialing	DTMF
FCC registration number	EBZUSA-20078-XD-N
Framing type	D4, also known as Superframe (SF)
Digital network interface	On board DSX-1 interface
Line coding (receiver)	AMI
Line coding (transmitter)	AMI
Other equipment	CSU—required DSU—depends on capabilities of CSU; usually not required CSU–to–D/240PCI-T1 cable—must have an RJ-48C connector to connect to the D/240PCI-T1
Ringer equivalence number	0.0A
Supervisory signal	2- or 4-wire E&M—wink-start E&M signaling is the default and recommended protocol; immediate-start E&M requires manual configuration FXS—immediate-start FXS signaling requires manual configuration
T-1 signaling	Robbed bit
T-1 span support	Full 24 timeslots (partial and fractional T-1 are not supported)
Timing (synchronization)	Loop timing (external clock)
Voice coding	PCM
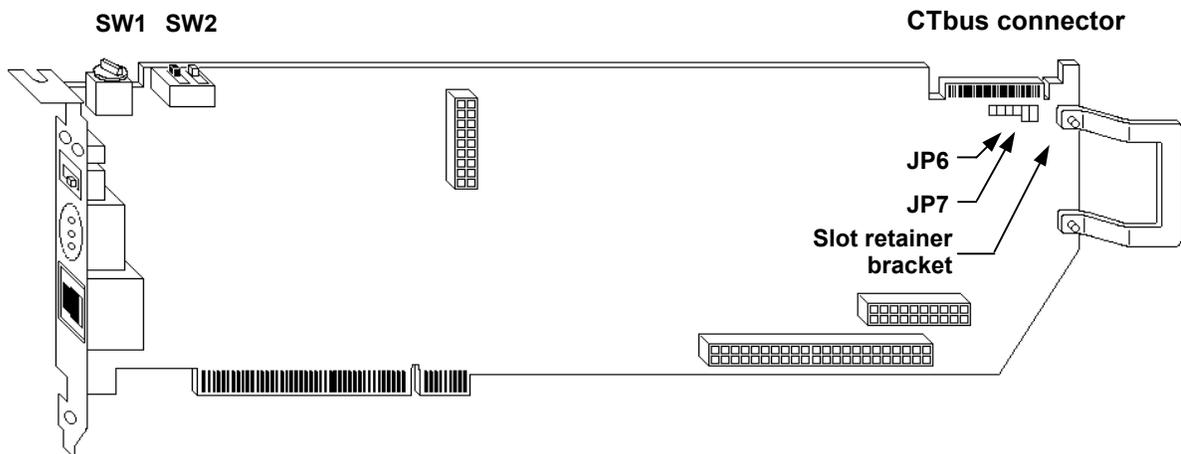
Figure 3. Layout of the D/240PCI-T1

Preparing Dialogic PCI Linecards for Installation

Depending on the linecard you are installing, you will need to configure some or all of the following components of the Dialogic PCI linecard before installing it in the OneBox platform.

- Assign a linecard identification number based on the ports it will provide.

- Configure the linecard to use an SCbus clock (except on the D/120JCT-LS model).

- In the case of the D/41EPCI and the D/120JCT-LS, configure its default line state.

- If the platform has only PCI expansion slots, remove the slot retainer brackets from the linecards.

Assigning the Linecard Identification Number

Each Dialogic linecard installed in the OneBox platform must be configured with a unique linecard identification number (referred to by Dialogic as the Board ID, Board Locator ID, or Board Locator Technology ID). This number, from 1 through F hex (1–15 decimal), is used by Dialogic System Software to determine which linecard is sending a signal. If two or more linecards installed in the platform are configured to use the same linecard identification number, the Dialogic System Software (device driver) will be unable to locate either linecard. *Unique linecard identification numbers must be assigned in ascending order to each linecard starting at 1.*

OneBox assigns line numbers in ascending order based on the linecard identification number. For example, if you install a D/240PCI-T1 linecard to which you have assigned linecard ID 1, the 24 channels it provides will be assigned by OneBox the line numbers 1–24. If you then install a D/41EPCI to which you have assigned linecard ID 2, the four ports it provides will be assigned the line numbers 25–28.

Precedence in Mixed Systems

D/240PCI-T1 linecards must be assigned the lowest linecard identification numbers of any linecards installed in the platform starting at ID 1. The D/240PCI-T1 will not function properly if another model of PCI linecard, such as a D/41EPCI, is assigned a lower linecard identification number. For example, if you are adding two D/240PCI-T1 linecards in a platform that currently has two D/41EPCI linecards, the D/240PCI-T1 linecards must be assigned ID 1 and ID 2, and the D/41EPCI linecards must be changed to ID 3 and ID 4.

IMPORTANT

Do *not* configure any Dialogic PCI linecard to linecard identification number 0. We do not support the automatic linecard identification number assignment scheme for PCI linecards (called Geographic Sequencing by Dialogic).

To set the linecard identification number:

- Dial the rotary switch to select a unique linecard identification number, as shown in the example in Figure 4.

  For the location of the rotary switch, refer to:

  - Figure 1 if you are installing a D/41EPCI (SW1)

  - Figure 2 if you are installing a D/120JCT-LS (SW100)

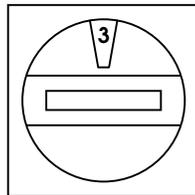 - Figure 3 if you are installing a D/240PCI-TI (SW1)

**Figure 4. A rotary switch
set to linecard ID 3**

Configuring the Linecard for SCbus Mode

To function in SCbus mode, the CTbus on the linecard *must* be configured to use an SCbus clock. You configure the CTbus with hardware using jumpers or with software by the Dialogic System Software, depending on the linecard you are installing.

- D/41EPCI and D/240PCI-T1 linecards use hardware to configure the CTbus.

- D/120JCT-LS linecards are configured autvmtically by the Dialogic System Software. Skip to "Configuring the Default Line State (Hook Switch State)."

To configure a D/41EPCI or a D/240PCI-T1 for SCbus mode:

- Install jumpers on pins 1–2 of JP6 and JP7 as shown in Figures 5 and 6.

  For the location of JP6 and JP7, refer to:

  - Figure 1 if you are installing a D/41EPCI

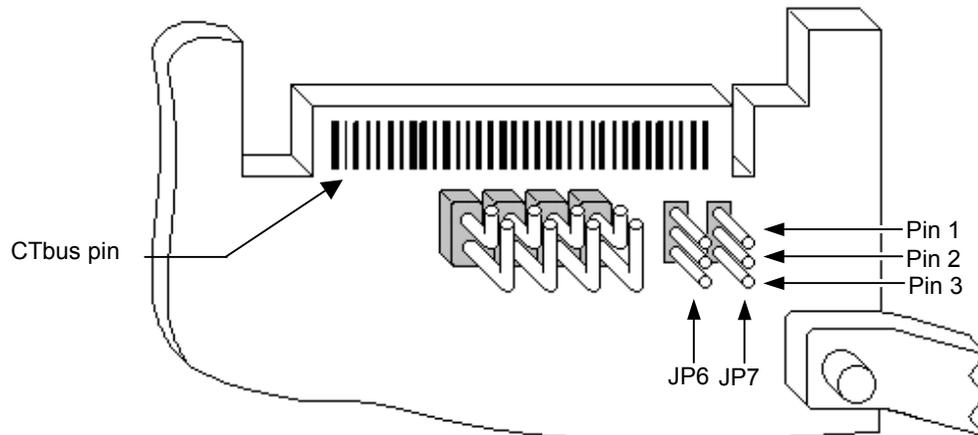 - Figure 3 if you are installing a D/240PCI-T1
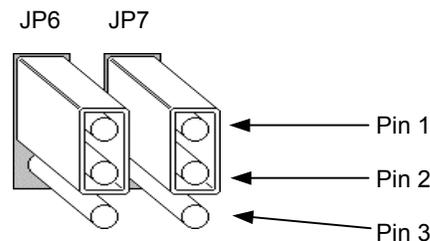

Figure 5. Jumper blocks JP6 and JP7

Figure 6. Jumpers in place on pins 1 and 2

Configuring the Default Line State (Hook Switch State)

D/41EPCI and D/120JCT-LS linecards have a configurable default line state (hook switch state). This setting determines how the linecards will respond to incoming telephone calls when the OneBox platform is turned on, but either OneBox or the Dialogic System Software is not running.

- If the switch is in the OFF position, the default line state is *onhook*; callers will get a ring-no-answer (RNA) response.

- If the switch is in the ON position, the default line state is *offhook*; callers will get a busy signal.

Note   If the computer platform is turned off, callers will get an RNA response.

To set the default line state:

- Set the default line state of the linecard to *offhook*.

If you are preparing a…	*Then…*
D/41EPCI	Flip the SW2 switch position 1 to the ON position.
D/120JCT-LS	Flip the SW1 switch position 1 to the ON position.
D/240PCI-T1	No configuration is necessary. The default line state for these cards is *offhook*.
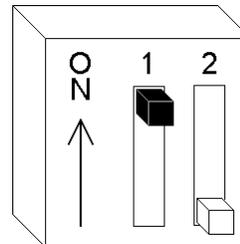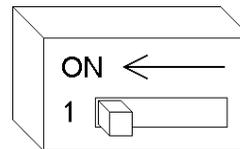
Removing the Slot Retainer Bracket

Depending on the design of the platform, you may need to remove the slot retainer bracket from the inside edge of the linecard. Refer to Figure 1, Figure 2, or Figure 3 for the location of the slot retainer bracket.

To remove the slot retainer bracket:

- Choose one:

If the platform is designed for…	*Then…*
PCI cards only	Remove the slot retainer bracket from the end of the card before installing it.
ISA and PCI cards	Leave the slot retainer bracket attached. The slot retainer bracket allows you to install the card in a platform that contains both ISA and PCI slots (where the PCI slots use the ISA form factor).

Installing Dialogic PCI Linecards in the Platform

Since Dialogic PCI linecards are designed for the PCI expansion bus, you must assign the interrupt request queue (IRQ) numbers and memory addresses used by the cards through the platform's BIOS instead of by configuring jumpers or switches. The method you use to do this varies from one platform (and therefore one BIOS) to another. For example, one BIOS may allow you to assign IRQ 5 to the PCI expansion slots you intend to use for the linecard, while another BIOS may assign IRQ 5 to a specific PCI expansion slot automatically based on the slot's physical location in the platform. On other platforms, all IRQs are assigned automatically by the BIOS. Refer to the platform documentation to determine how to configure the platform to assign IRQs to expansion slots used by PCI linecards.

If you are required to assign explicit IRQs to the PCI linecards in a platform, *all of those linecards must share IRQ 5*. After you have prepared the Dialogic PCI linecards for installation and have determined how to assign IRQs to the expansion slots they will use, you can install the linecard in the platform.

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IMPORTANT

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Dialogic PCI linecards cannot be used in a computer platform that also contains Dialogic ISA linecards (includes D/41D, D/41ESC, and D/160SC-LS). If ISA linecards are currently installed in the platform, they must be removed prior to installing the PCI linecards. Dialogic PCI linecards *can* be used in conjunction with all Brooktrout fax cards.

To install Dialogic PCI linecards:

1. Verify that the linecard identification number, the CTbus, and the default line state (if applicable) are configured for each linecard, and that its slot retainer bracket is removed, if necessary (refer to "Preparing Dialogic PCI Linecards for Installation" for instructions).

2. If necessary, configure the Dialogic system service to start manually.

If Dialogic System Software is…	*Then…*
Installed on the platform	Continue to step 3.
Not installed on the platform	Skip to step 7.

3. From the Start menu, point to Programs, point to Dialogic System Software, and select **Dialogic Configuration Manager – DCM**.

4. From the Service menu, point to Startup Mode, and select **Manual**.
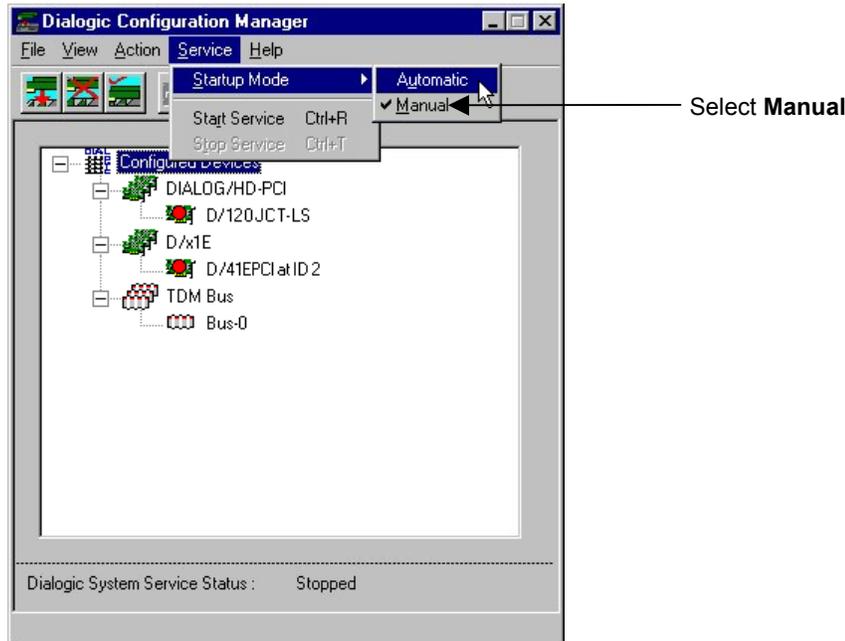
5. From the File menu, select **Exit**.

6. Shut down the operating system.

7. Turn off the computer, unplug its power cord, and remove its cover.

8. Select a PCI expansion slot.

If the linecard…	*Then…*
Replaces an existing linecard	Remove the existing linecard from the PCI expansion bus slot and use this expansion slot for the replacement linecard.
Adds ports to the OneBox platform	Select an empty PCI expansion bus slot that will be assigned IRQ 5 and remove its retaining screw and cover plate.

9. Insert the linecard into the PCI bus slot. Gently press the linecard down to seat the edge connector into the slot, applying pressure only to the top edge of the board. Rocking the card or applying excess pressure may damage the card or the bus connector.

10. Secure the card with the appropriate retaining screw or a locking clip.

> **Note** If you do not secure the card, you can unseat it from the slot when you attach the CTbus cable later in the installation process.

11. Repeat steps 8–10 for each linecard.

12. If you have more than one PCI card installed, cable the cards together.

IMPORTANT

Do *not* terminate the board at each end of the CTbus cable. CTbus termination jumpers are ignored when the cards are used in an SCbus configuration.

a. Plug the first (end) connector on the CTbus cable to the CTbus edge connector on the top edge of the first PCI card.

   The connectors are designed to fit together one way only. If the connector does not seat fully on the card, turn the cable around and try again. When attached correctly, the colored stripe on the cable faces the rear bracket. (The stripe must be adjacent to pin 1 on the card connector.)

b. Plug the last (opposite end) connector on the CTbus cable to the CTbus connector on the last PCI card installed in the platform.

c. Plug a connector on the CTbus cable to the CTbus connector on each remaining intermediary PCI card installed in the platform.

d. Tuck any extra connectors or loose ribbon cable down into the computer so that it does not snag when you replace the platform cover.

13. Replace the cover on the platform and plug in the power cord.

14. Proceed to "Cabling Dialogic Linecards to the Telephone System."

Cabling Dialogic Linecards to the Telephone System

Each of the linecards described in this document uses a different type of linecord to connect to the telephone system. This section discusses each of these different types of linecord.

Cabling D/41EPCI Linecards to the Telephone System

With the D/41EPCI linecard(s) installed in the platform, you can now cable the platform to the telephone system. As described in "Assigning the Linecard Identification Number," OneBox assigns port numbers in ascending order based on the linecard identification number. For example, a D/41EPCI linecard to which you assigned the linecard ID 1 will be assigned line numbers 1–4; a D/41EPCI linecard to which you assigned the linecard ID 2 will be assigned line numbers 5–8 (as shown in Figure 7). Keep this line number assignment scheme in mind when connecting each D/41EPCI linecard to the telephone system.
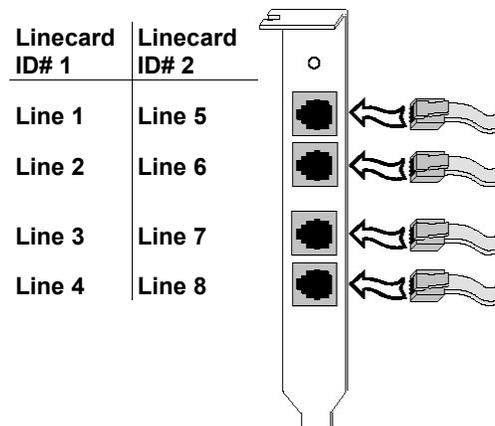
Linecard ID# 1	Linecard ID# 2
Line 1	Line 5
Line 2	Line 6
Line 3	Line 7
Line 4	Line 8

Figure 7. Line assignment scheme for D/41EPCI linecards

D/41EPCI linecards use RJ-11 connectors to interface with the telephone system. Depending on the type of linecord your local public telephone network uses, you may need linecord adapters to connect the computer platform. For example, we ship each Dialogic D/41EPCI linecard sold in North America with two RJ-11–to–RJ-14 linecord adapters (shown in Figure 8). These adapters allow you to connect the RJ-11 single-channel connectors at the back of the D/41EPCI to a two-channel RJ-14 linecord. If linecord adapters are required and not included with the linecards, please contact your technical service representative.

Figure 8. RJ-11–to–RJ-14 linecord adapter

To cable D/41EPCI linecards:

- Plug the linecords (jacks) from the telephone system to the RJ-11 connectors on the D/41EPCI (refer to the line assignment diagram shown in Figure 7).

 −or−

 If the linecords from the telephone system do not use RJ-11 connectors, plug the linecords into the appropriate linecord adapter, then plug the RJ-11 linecord(s) of the adapter into the RJ-11 connectors on the D/41EPCI.

Cabling D/120JCT-LS Linecards to the Telephone System

With the D/120JCT-LS linecard(s) installed in the platform, you can now cable the platform to the telephone system. As described in "Assigning the Linecard Identification Number," OneBox assigns port numbers in ascending order based on the linecard identification number. For example, a D/120JCT-LS linecard to which you assigned the linecard ID 1 will be assigned line numbers 1–12; a D/120JCT-LS linecard to which you assigned the linecard ID 2 will be assigned line numbers 13–24 (as shown in Figure 9). Keep this line number assignment scheme in mind when connecting each D/120JCT-LS linecard to the telephone system.

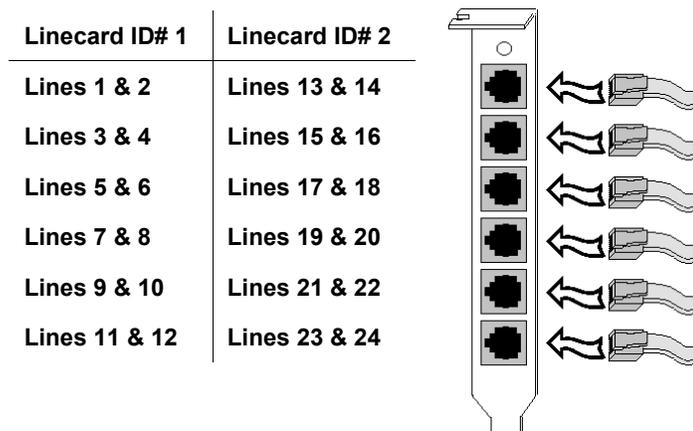| Linecard ID# 1	Linecard ID# 2
Lines 1 & 2	Lines 13 & 14
Lines 3 & 4	Lines 15 & 16
Lines 5 & 6	Lines 17 & 18
Lines 7 & 8	Lines 19 & 20
Lines 9 & 10	Lines 21 & 22
Lines 11 & 12	Lines 23 & 24

Figure 9. Line assignment scheme for D/120JCT-LS linecards

There are six modified RJ-14 connectors on the rear brackets of D/120JCT-LS linecards. Figure 10 shows how the pins in these modified connectors are arranged.
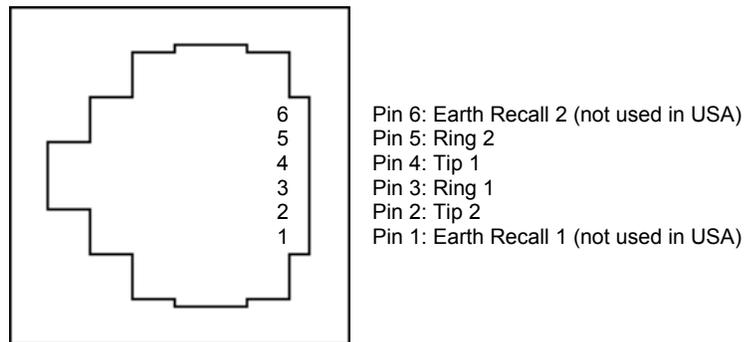

6	Pin 6: Earth Recall 2 (not used in USA)
5	Pin 5: Ring 2
4	Pin 4: Tip 1
3	Pin 3: Ring 1
2	Pin 2: Tip 2
1	Pin 1: Earth Recall 1 (not used in USA)

Figure 10. Pinouts for the RJ-14 connectors

Note   Pins 1 and 6 are not used and should not be connected to the telephone system. The connectors on the rear brackets of the D/120JCT-LS cards accept linecords equipped with standard two-line RJ-14 connectors.

Depending on the type of linecord your local public telephone network uses, you may need linecord adapters to connect the computer platform to the telephone system (switch). If linecord adapters are required and not included with the linecards, please contact your technical service representative.

To cable D/120JCT-LS cards:

- Plug the linecords (jacks) from the telephone system to the RJ-14 connectors on the D/120JCT-LS (refer to the line assignment diagram shown in Figure 9).

  −or−

  If the linecords from the telephone system do not use RJ-14 connectors, plug the linecords into the appropriate linecord adapter, then plug the RJ-14 linecord(s) of the adapter into the RJ-14 connectors on the D/120JCT-LS.

Cabling D/240PCI-T1 Linecards to the Telephone System

With the D/240PCI-T1 linecard(s) installed in the platform, you can now cable the platform to the telephone system. As described in "Assigning the Linecard Identification Number," OneBox assigns line numbers in ascending order based on the linecard identification number. For example, a D/240PCI-T1 linecard to which you assigned linecard ID 1 will be assigned line numbers 1–24; a D/240PCI-T1 linecard to which you assigned linecard ID 2 will be assigned line numbers 25–48 (as shown in Figure 11). Keep this line number assignment scheme in mind when connecting each D/240PCI –T1 linecard to the telephone system.
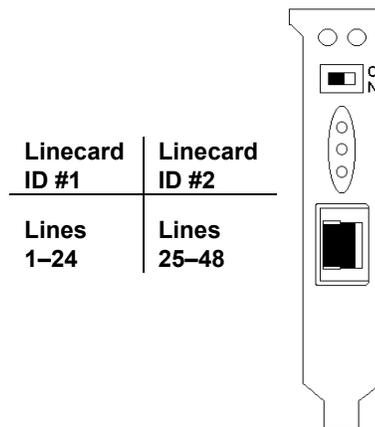

Figure 11. Line assignment scheme for D/240PCI-T1 linecards

This section describes the basic equipment for implementing T-1 and how to connect this equipment to a D/240PCI-T1 linecard. The equipment needed for a T-1 installation is shown in Figure 12 and explained in the following paragraphs.
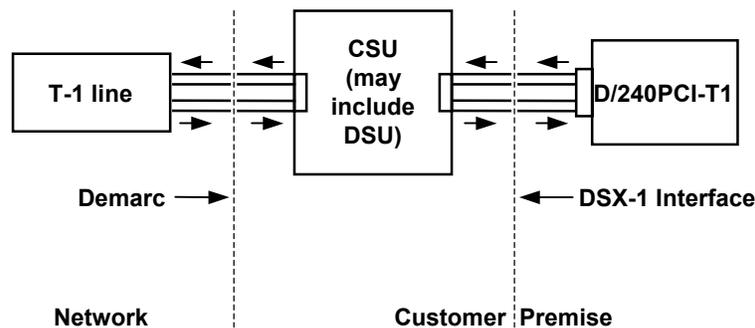

Figure 12. Basic T-1 equipment requirements

Channel Service Unit

The Channel Service Unit (CSU) is usually the first piece of equipment on the customer premises that connects to the T-1 line. A CSU is required any time metallic T-1 services are ordered from a local exchange (all the Regional Bell Operating Companies) or interexchange carrier (including long-distance carriers like MCI, Sprint, and AT&T). Metallic T-1 uses wire to carry the signal instead of optical fiber or microwave radio. The CSU connects a DS-1–level line to DSX-1–compatible customer equipment. The CSU may be a standalone unit or it may be integrated into a PBX.

The CSU provides functions that are critical to the network. It provides loopback capabilities for running diagnostic tests to locate where problems are occurring on the T-1 chain. Some CSUs have dial-in capability for performing remote diagnostics.

The CSU is the last point where the signal is regenerated as it leaves the network. It also provides line equalization, provides voltage protection for telephone company and customer premise equipment, monitors the T-1 line for violations, and generates "keep alive" signals and error condition messages. (A "keep alive" signal is a bit stream of all "ones" used to power repeaters in the circuit when there is no activity on the line.)

The CSU that you connect to the D/240PCI-T1 must support Superframe (D4) format.

Digital Service Unit

A Digital Service Unit (DSU) may be installed at some sites. The DSU traditionally serves to encode user data from unipolar to bipolar format, frame user data, and interpret some incoming bipolar patterns as network commands. The D/240PCI-T1 performs most DSU functions. However, it cannot interpret some bipolar violations from the network as commands to go into (or out of) loopback modes. Therefore, a DSU should be removed from most sites when using a D/240PCI-T1. Further, DSU functions are generally integrated into current CSUs.

D/240PCI-T1 Connection to Other Equipment

The D/240PCI-T1 can connect to certain other equipment without the need for an additional CSU. For example, the D/240PCI-T1 can connect to a T-1 interface on a 4*ESS* (Electronic Switching System) or 5*ESS* telephone system without a CSU, provided that the connecting cable to these devices is not over 655 feet (approximately 200 meters) in length. Confirm these specifications with your carrier.

Many PBXs have built-in CSUs or CSU-like functions. The D/240PCI-T1 can connect directly to these devices provided that the PBX has a DSX-1 interface (the D/240PCI-T1 will not respond to loopback commands when connected this way). See your switch or PBX documentation to confirm that your equipment has the necessary features.

Although the D/240PCI-T1 and some PBXs have built-in CSU functions, some carriers require a CSU to be present so that they can perform diagnostics on the T-1 line. Always consult with your carrier for its requirements.

T-1 Line–to–CSU Cable

T-1 connectors vary from carrier to carrier, but the cable provided by the T-1 carrier usually consists of two pairs of individually shielded twisted 22-gauge wires (one transmit pair and one receive pair) terminated in either a DB-15 or modular RJ-48C plug. When you order service, make sure that the type of plug the carrier provides is compatible with the type of plug your CSU accepts. Older CSUs may require that you connect the wires directly to a terminal strip or similar arrangement. Refer to your CSU documentation for more information.

Wet or Dry T-1

T-1 lines that carry a voltage to power regenerative repeaters are called *wet T-1*. This voltage traditionally has also been used to power the CSU at a site. Since 1987, the Federal Communications Commission no longer requires the carrier to provide line power, and the trend has been to discontinue its use. T-1 lines without power are called *dry T-1*. If your carrier provides dry T-1, then your CSU must have an AC power source. Check with your carrier to see what kind of line they supply so that you can obtain an appropriate CSU. Many of the latest CSUs can handle either kind of line.

CSU–to–D/240PCI-T1 Adapter Cable

The D/240PCI-T1 has an RJ-48C connector on the rear bracket. To connect this linecard to the CSU you can purchase a CSU-to-equipment adapter cable or build one yourself.

The recommended material for the cable is shielded twisted-pair (ABAM 600 or equivalent) in which each of the two pairs is shielded and the two pairs share a common shield. This type of shielding helps to avoid crosstalk problems on the line.

Choose an appropriate cable length for your installation. Eighty-five feet (approximately 26 meters) is the maximum recommended cable length between the CSU and the D/240PCI-T1 for standard T-1 signals (6 volts peak to peak). In general, you should keep the cable length as short as possible. Refer to your CSU documentation for guidelines concerning cable lengths greater than 85 feet (26 meters).

Connect the cable wires to the proper pinouts on the RJ-48C connector on the D/240PCI-T1 end of the cable. The pinout designation is shown in Figure 13. Consult your CSU documentation for the proper pinout designation and connector type for the CSU.

You should also follow your CSU documentation concerning grounding the cable. CSU-to-equipment cables are usually grounded at one end only. The CSU end of the cable is grounded and the D/240PCI-T1 end of the cable is not. If it is required by the CSU, you can ground the D/240PCI-T1 end of the cable by attaching the common shield to the metal casing of the plug you are connecting to the D/240PCI-T1. This will provide adequate grounding to the platform chassis when the cable is attached to a properly installed D/240PCI-T1 card.
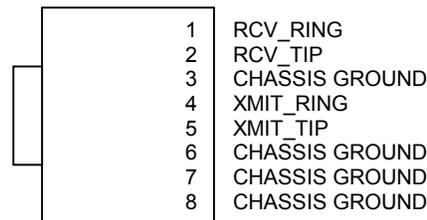
```
1 | RCV_RING
2 | RCV_TIP
3 | CHASSIS GROUND
4 | XMIT_RING
5 | XMIT_TIP
6 | CHASSIS GROUND
7 | CHASSIS GROUND
8 | CHASSIS GROUND
```

Figure 13. Pinouts for RJ-45/48C connector on the rear bracket of a D/240PCI-T1

To cable D/240PCI-T1 linecards:

1. Connect the T1 line–to–CSU cable to the CSU.

2. Connect the grounded end of the CSU–to–D/240PCI-T1 adapter cable to the connector on the CSU.

3. Connect the ungrounded end of the CSU–to–D/240PCI-T1 adapter cable to the RJ-48C connector at the back of the D/240PCI-T1.

4. If the CSU requires that you ground both ends of the CSU–to–D/240PCI-T1 adapter cable, attach the common shield on the adapter to the metal casing of the connector on the D/240PCI-T1. This will provide adequate grounding to the platform chassis.

Installing Dialogic System Software

Once the linecards have been installed into the platform, cabled to other linecards, and connected to the telephone system, the Dialogic System Software can be installed or upgraded on the OneBox platform. Refer to Table 4 to determine which version of Dialogic System software your system requires.

Table 4. OneBox and Dialogic Matrix

| *OneBox Version*	*Dialogic System Software*	*Dialogic System Software Location*
OneBox for Windows NT 1.0 and 1.10	DNA 2	On OneBox CD-ROM
OneBox 2.0	DNA 3.3	On OneBox CD-ROM
OneBox 2.01	SR5.01	On separate CD-ROM provided with OneBox server

Removing Existing System Software

Before installing upgrading to a new version of Dialogic software, you must remove any existing versions from the platform.

To uninstall Dialogic System Software:

1. Start the computer and log on to Windows NT Server with an account that has local Administrator privileges on the OneBox platform.

2. Shut down the telephony server and related services and clear the Automatic Start checkbox (refer to the guide *Administering OneBox,* which accompanied your telephony server platform).

3. From the Start menu, point to Programs, and select **Dialogic System Software**.

4. If the Dialogic System Service is running, click the red **Stop** icon on the toolbar or select **Stop Service** from the Service menu.
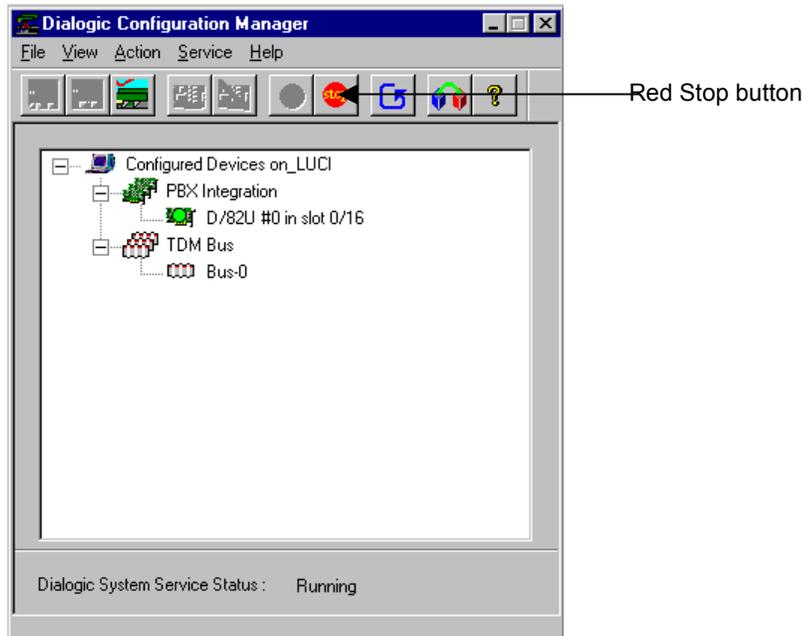
5. From the Start menu, point to Programs, point to Dialogic System Software, and select **Uninstall**.

6. At the Uninstall dialog box, click **Yes**.

IMPORTANT

If the uninstall program displays a warning about deleting the shared file *Ctl3d32.dll*, click *No* to prevent its deletion.

It is safe to delete all other shared files.

7. At the second Uninstall dialog box, click **OK**.

8. When prompted to reboot the computer, click **Yes**.

9. After rebooting, right-click the My Computer icon and select **Explore**.

10. From the C:\Program Files directory, delete the Dialogic folder and its contents.

Delete Dialogic
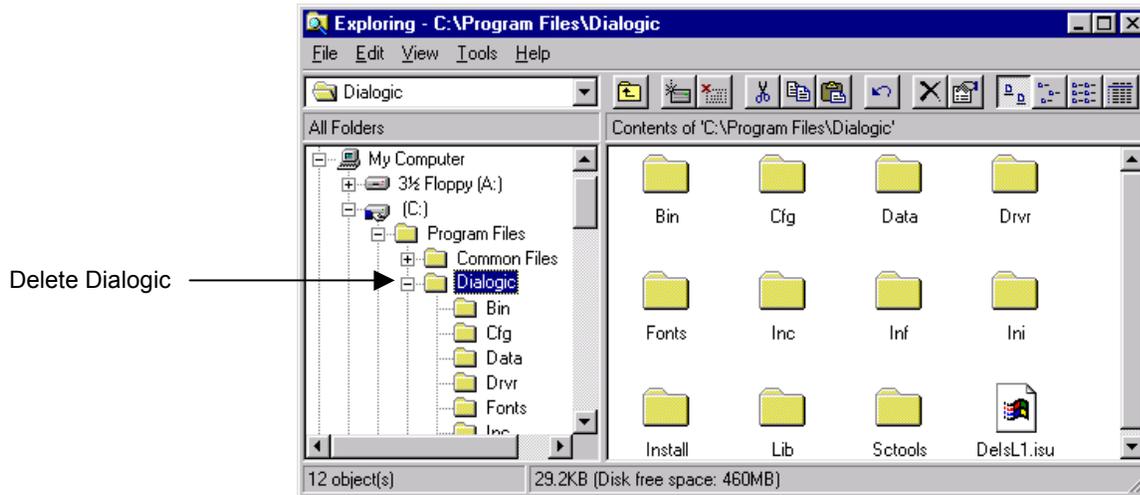
11. Restart the computer.

12. Continue to the following section, "Installing Dialogic System Software."

Installing Dialogic System Software

The installations of DNA version 2, DNA version 3.3, and SR5.01 are virtually identical. Except where noted due to variation between the versions, the installation of SR5.01 is given.

> **IMPORTANT**
>
> **When installing a D/120JCT-LS linecard in a OneBox 2.0 system, the linecard will not function correctly unless DNA version 3.3 is both installed correctly and updated with Dialogic's DNA 3.3 Service Pack 1. If you are installing one or more D/120JCT-LS linecards in a 2.0 system, be sure to read the section "Installing Service Pack 1 for DNA Version 3.3 (D/120JCT-LS Only)," later in this document.**
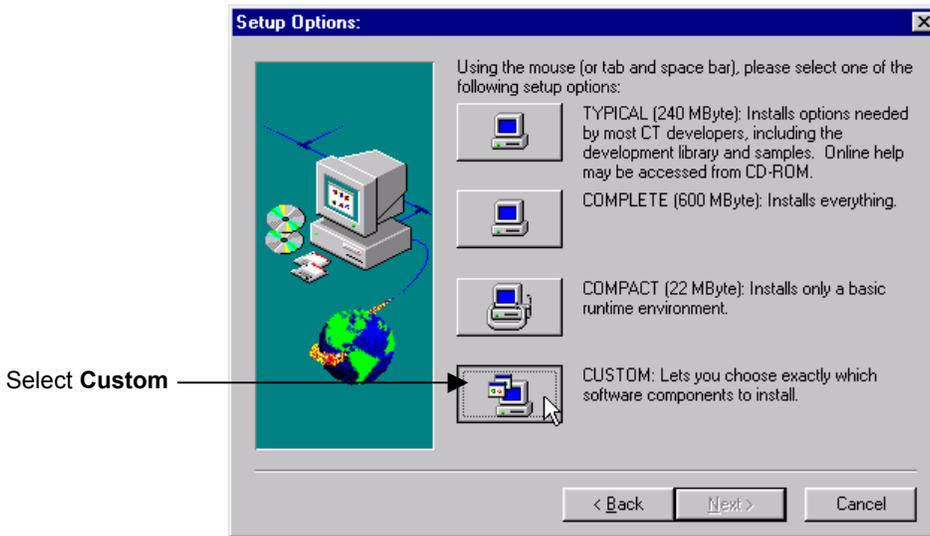>
> **Also, Windows NT 4.0 with Service Pack 6A must be installed on the telephony server prior to installing Dialogic System Software SR5.01.**

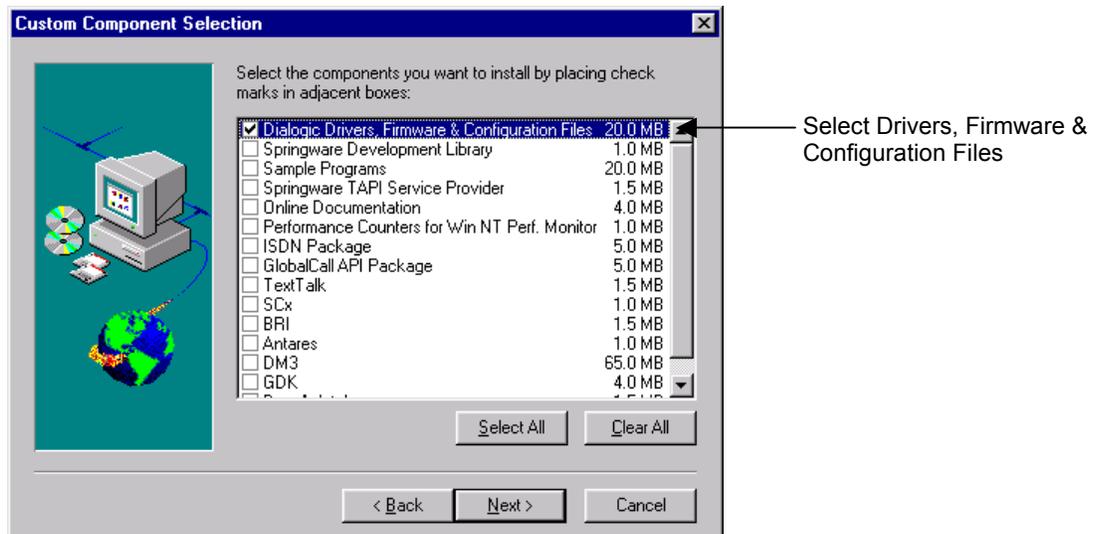**To install Dialogic System Software SR5.01:**

1. Log on to Windows NT Server with an account that has local Administrator privileges on the OneBox platform.

2. Insert the Dialogic program CD-ROM into the CD-ROM drive.

3. From the Start menu, select **Run** and click **Browse** to find Setup.exe on the Dialogic CD-ROM.

4. Double-click **Setup.exe**.

5. With the path to Setup.exe in the Run dialog box, click **OK** to start the setup Wizard.

6. At the Welcome dialog box, read the notices shown and click **Next**.

7. At the Registration dialog box, enter values in the **Name** and **Company** fields and click **Next**.

    Note You must enter values in these fields to continue.

8. In the Setup Options dialog box, click **Custom**.

Setup Options:

Using the mouse (or tab and space bar), please select one of the following setup options:

TYPICAL (240 MByte): Installs options needed by most CT developers, including the development library and samples. Online help may be accessed from CD-ROM.

COMPLETE (600 MByte): Installs everything.

COMPACT (22 MByte): Installs only a basic runtime environment.

Select **Custom** ──────→

CUSTOM: Lets you choose exactly which software components to install.

< Back   Next >   Cancel

9. In the Custom Components Selection dialog box, select *only* the **Dialogic Drivers, Firmware & Configuration Files** option, then click **Next**.

Custom Component Selection

Select the components you want to install by placing check marks in adjacent boxes:

☑ Dialogic Drivers, Firmware & Configuration Files 20.0 MB   ←──── Select Drivers, Firmware & Configuration Files
☐ Springware Development Library   1.0 MB
☐ Sample Programs   20.0 MB
☐ Springware TAPI Service Provider   1.5 MB
☐ Online Documentation   4.0 MB
☐ Performance Counters for Win NT Perf. Monitor   1.0 MB
☐ ISDN Package   5.0 MB
☐ GlobalCall API Package   5.0 MB
☐ TextTalk   1.5 MB
☐ SCx   1.0 MB
☐ BRI   1.5 MB
☐ Antares   1.0 MB
☐ DM3   65.0 MB
☐ GDK   4.0 MB

Select All   Clear All

< Back   Next >   Cancel

10. In the Destination Location dialog box, accept the default destination path by clicking **Next**.

11. In the Setup Options Summary dialog box, verify that the options described in steps 9 and 10 appear in the Current Settings list.

   If you need to change any of the options, return to the appropriate dialog box by clicking **Back**; otherwise click **Next**.
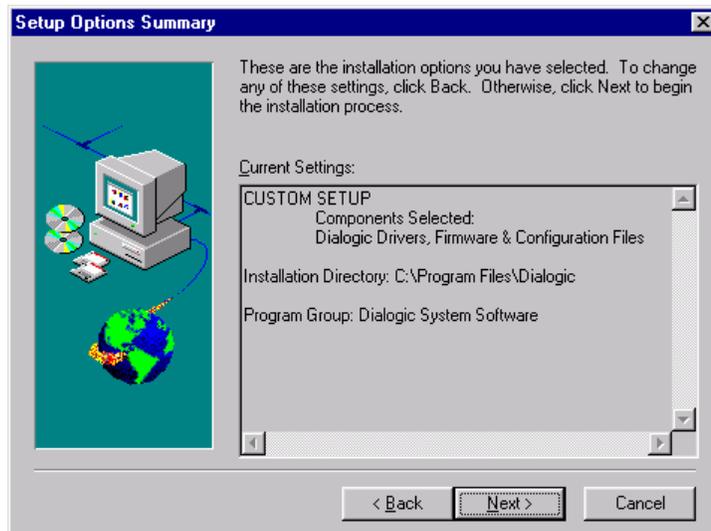
12. In the Please Make Your Selection Now dialog box, clear all checkboxes and click **Next**.

   Note   In the DNA version 2 installation, this dialog box is titled Setup Finish Options and does not have the *Would you like to install SpeechWorks?* option.
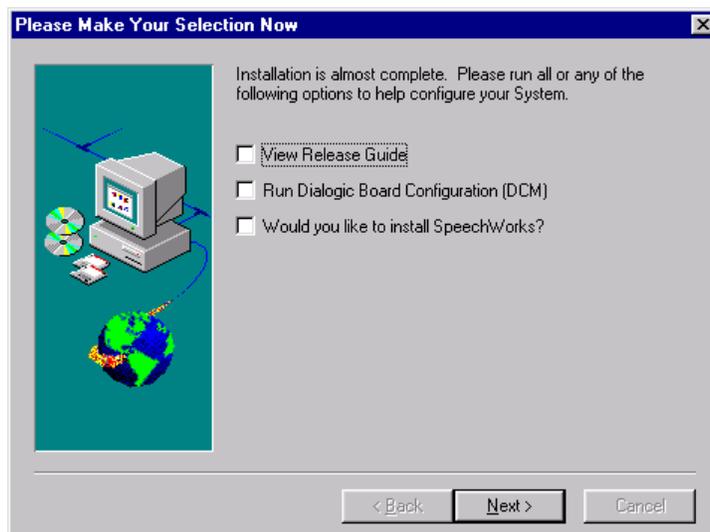
13. When the installation is complete, select **Yes, I want to restart my computer now**, then click **OK**.

14. Choose one:

If you have installed Dialogic System Software…	*Then…*
DNA 3.3 and are using a D/120JCT-LS linecard	Proceed to "Installing Service Pack 1 for DNA Version 3.3 (D/120JCT-LS Only)
In any other configuration	Skip to "Configuring Dialogic PCI Linecards in Dialogic Configuration Manager – DCM."

Installing Service Pack 1 for DNA Version 3.3 (D/120JCT-LS Only)

To ensure that the D/120JCT-LS linecard functions appropriately with the telephony server software, you must install Dialogic's Service Pack 1 for its DNA System Software version 3.3 immediately after you install DNA 3.3 itself. We include a CD-ROM containing Service Pack 1 for DNA version 3.3 with each D/120JCT-LS linecard we ship.

If you are not installing D/120JCT-LS linecards or not using DNS 3.3, please proceed to the next section, "Configuring Dialogic PCI Linecards in Dialogic Configuration Manager."

To install Service Pack 1 for DNA version 3.3:

1. Make sure that the telephony server is stopped and that none of its administrative utilities are running.

2. Insert the Service Pack 1 CD-ROM into the CD-ROM drive of the server platform containing the D/120JCT-LS linecard.

3. From the Start menu, select **Run**.

4. Click **Browse** on the Dialogic CD-ROM and locate the file Setup.exe.

5. Click **Setup.exe**, then click **Open**.

6. When you return to the Run dialog box, click **OK**.

7. At the Welcome dialog box, read the warnings shown and click **Next**. The setup program makes backup copies of certain previously installed files and copies updated versions of those files from the CD-ROM.

8. In the first Information dialog box, click **OK**.

9. In the second Information dialog box, note that you must now restart the platform; the setup program does not restart it automatically. To exit the setup program, click **OK**.

10. Shut down and restart the platform.

Configuring Dialogic PCI Linecards in Dialogic Configuration Manager

The Dialogic Configuration Manager (DCM) is a utility that allows you to configure a number of parameters used by the Dialogic System Software to control the Dialogic linecards installed in the platform. Each time you start the DCM, it automatically detects any such linecards and matches them with the corresponding configuration data. All of the linecards detected by the DCM and matched to configuration data appear in the list of Configured Devices on the main DCM window.

You can use the DCM to change the configuration data for any of the linecards in the Configured Devices list. The configuration of the Dialogic System Software can only be changed when the Dialogic system service is stopped. Conversely, the DCM will not apply the changes you make to the settings of the Dialogic System Software until you restart the Dialogic system service.

Note   The DCM has a comprehensive online help system. Consult the *Dialogic Installation and Configuration Knowledge Base* book in the help system for advice about troubleshooting the Dialogic System Software SR5.01.

To configure a Dialogic linecard:

1. Verify that the OneBox service is shut down and that the Automatic Startup box is unchecked in the System tab of the Configuration utility.

2. From the Start menu, point to Programs, point to Dialogic System Software, and select **Dialogic Configuration Manager – DCM**.
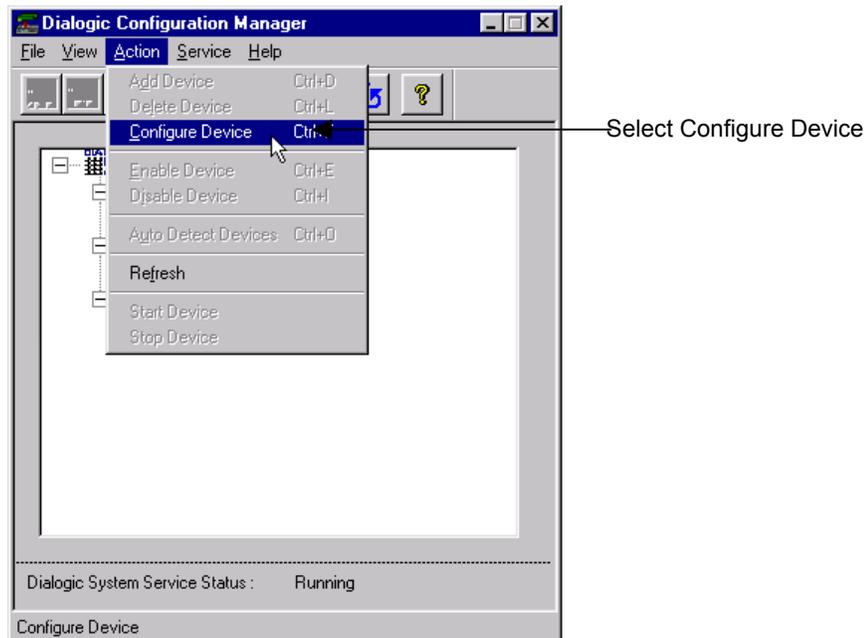
3. If the DCM is running, click the red **Stop** icon in the toolbar.

Red Stop button
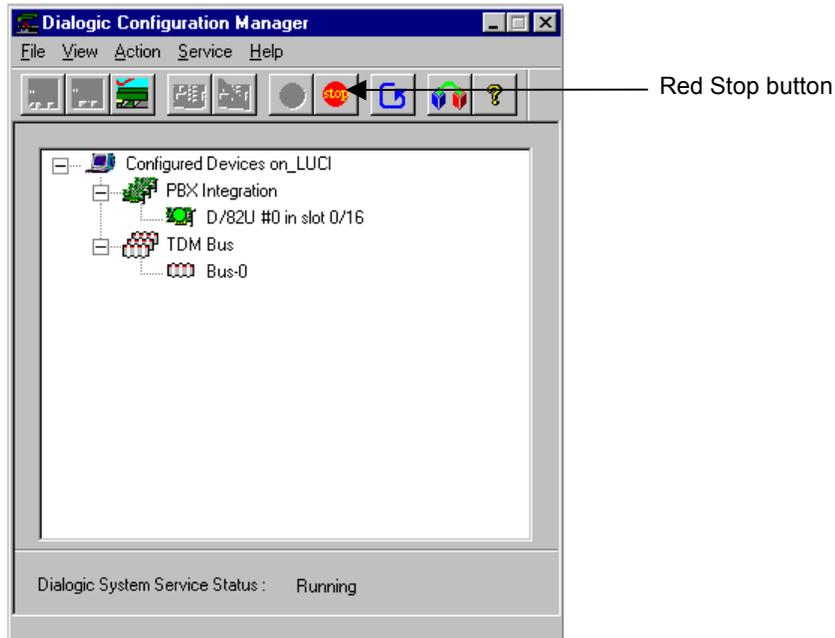
4. Highlight one of the cards that appears in the Configured Devices list.

Note If the card you added does not appear in the Configured Devices list, refer to the section "Adding a Linecard to the Configured Devices List."

5. From the Action menu, select **Configure Device**.

Select Configure Device

Note Click the **System** tab and verify that the three parameters are set appropriately for the card you are configuring. If so, skip to step 12; otherwise, continue with the following step.

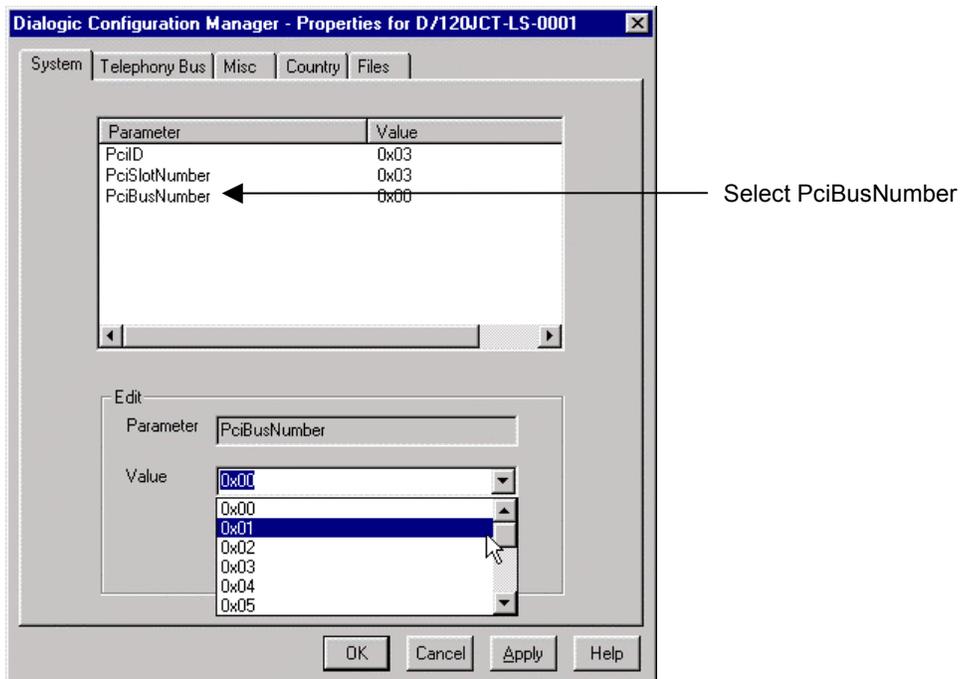6. From the Parameter list, select the **PciID** parameter.
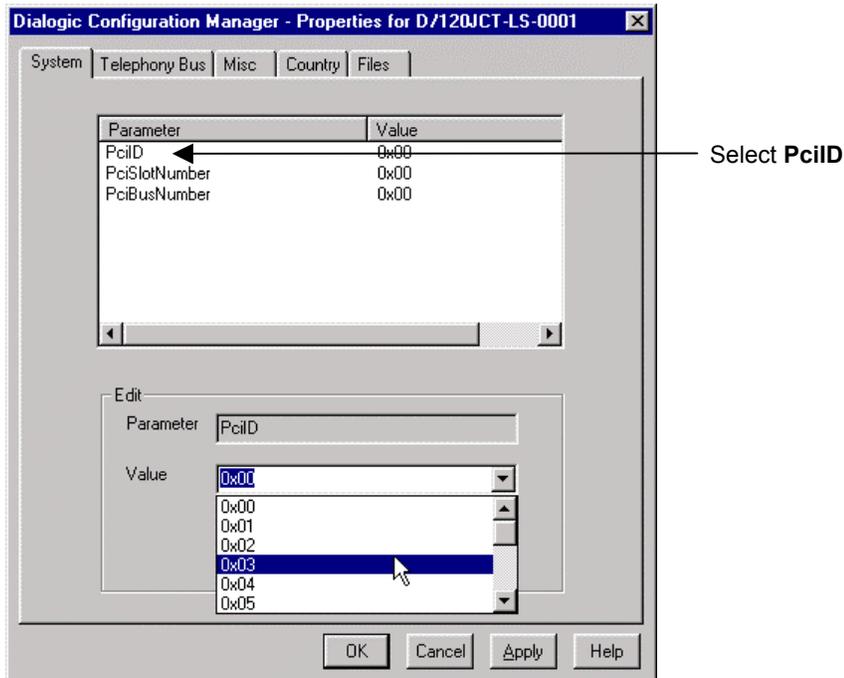
7. From the Value list, select the ID number you set on the card itself.

8. From the Parameter list, select **PciSlotNumber**.

Select PciSlotNumber
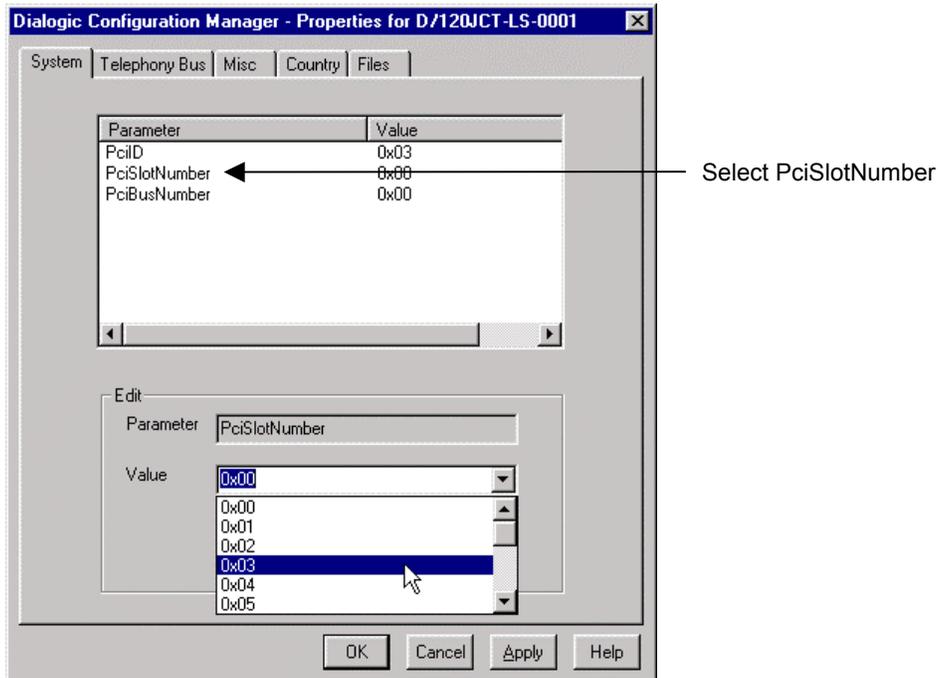
9. From the Value list, select the number of the PCI slot in which the card is installed.

10. From the Parameter list, select **PciBusNumber**.

Select PciBusNumber

11. From the Value list, select the number of the PCI bus on which the card is installed.

12. Click the Telephony Bus tab. Then, from the Parameter list, select **PCMEncoding**.

Note There are two PCM encoding schemes used around the world: μ-Law and A-Law. Telephone switches in North America and Japan typically use μ-Law. Telephone switches in South America and Europe typically use A-Law.

13. From the Value list, select the PCM encoding scheme used by your telephone switch.

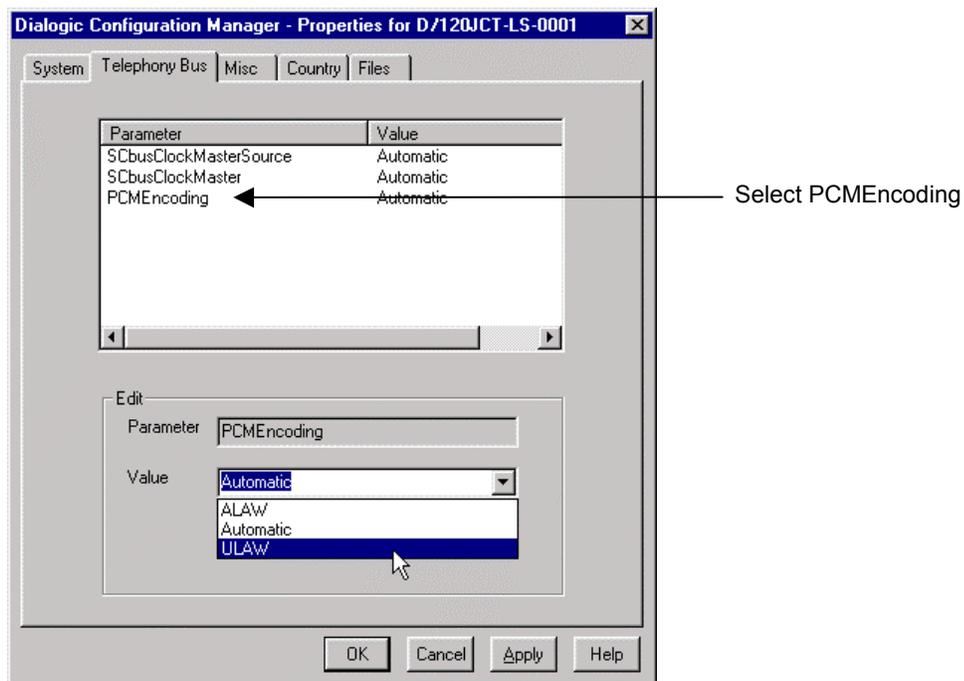| *If the PCM encoding used by the telephone switch is…*	*Then…*
μ-Law	Select **ULAW** in the value list.
A-Law	Select **ALAW** in the value list.

R3B © Aug 2001 Ericsson Enterprise AB

14. Click the Country tab; then from the Parameter list, select **Country**.

15. From the Value list, select your country.

Note The Country tab allows you to configure the Dialogic linecards installed in the platform for use in specific countries. Based on the value selected for the Country parameter, the DCM will suggest default values for the other parameters that optimize the configuration of the linecard for use in the selected country. We recommend using the default settings given by the DCM for your country.
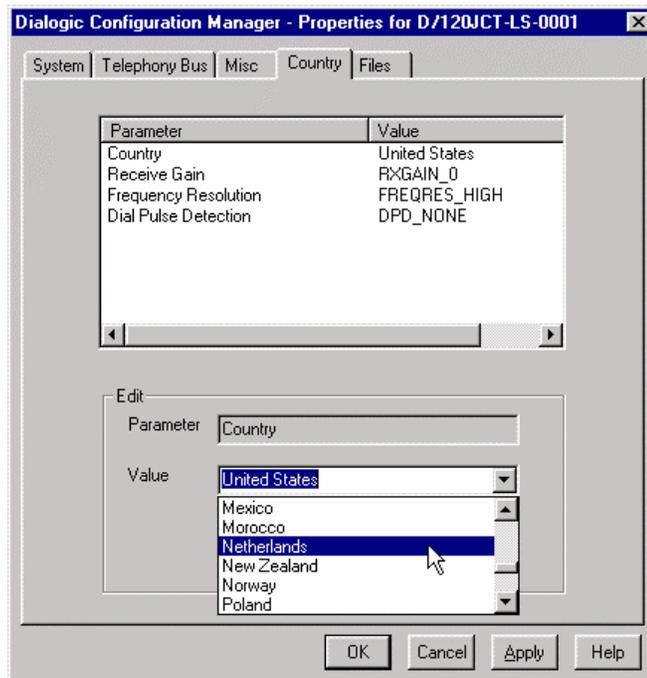
16. From the Parameter list, select **Frequency Resolution** (if available).
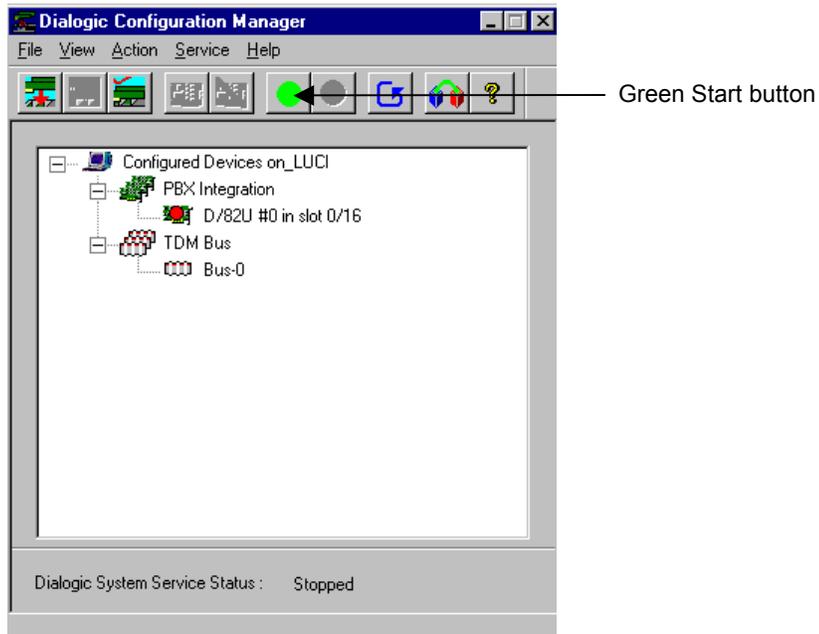
17. From the Value list, select **FREQRES_HIGH**.
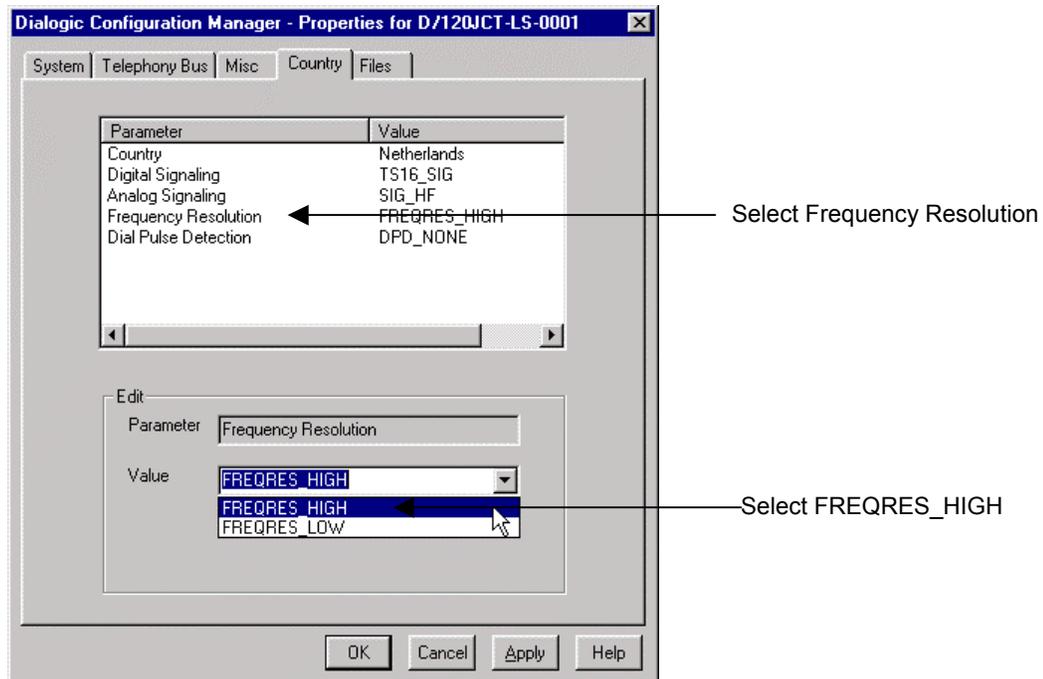
18. Click **Apply**, then **OK** to apply the changes you have made.

19. Repeat steps 4 through 18 for each Dialogic PCI linecard installed in the platform.

20. Click the green **Start** button on the toolbar.

Green Start button

21. From the Service menu, point to Startup Mode, then select **Automatic**.

22. Click **Close** at the confirmation dialog box.

23. Close the DCM.

24. Start OneBox and check the **Automatic Startup** check box on the System tab of the Configuration utility.

Adding a Linecard to the Configured Devices List

If the DCM fails to automatically detect a linecard that was added to the platform, you can add the linecard manually with the DCM.

To add a linecard:

1. From the Start menu, point to Programs, point to Dialogic System Software, and select **Dialogic Configuration Manager – DCM**.

2. If the Dialogic System Service is running, click the red **Stop** icon in the toolbar.

Red Stop button
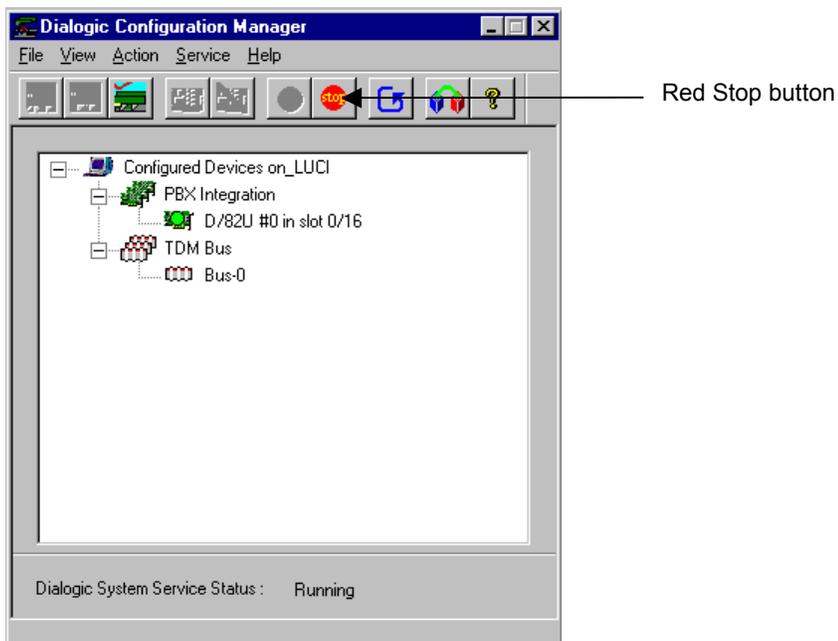
3. From the Action menu, select **Add Device**.
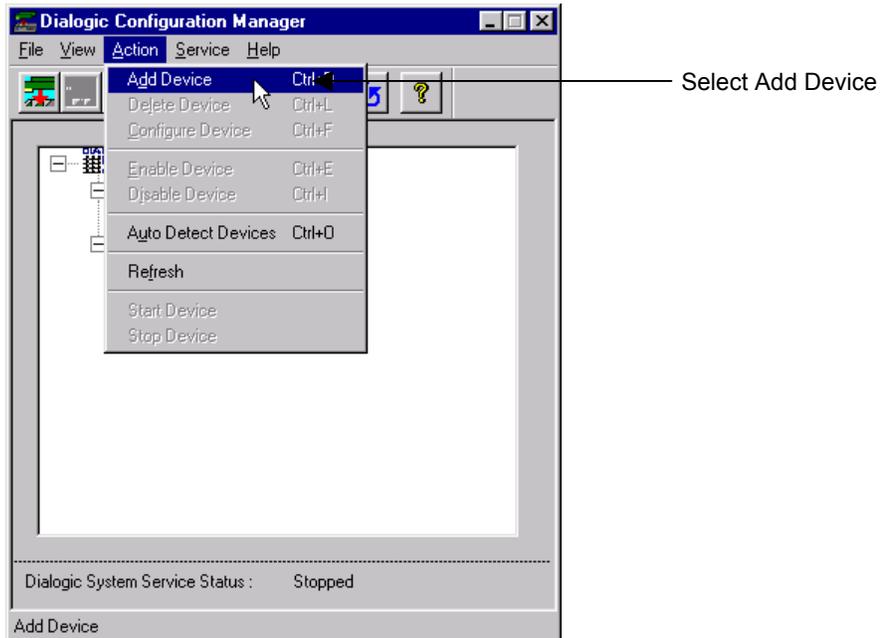
4. Follow the DCM Add Hardware Wizard's on-screen instructions to add the board and refer to the section "Configuring Dialogic PCI Linecards in Dialogic Configuration Manager."

Configuring Lines in OneBox Configuration

After you have installed the linecards in the OneBox platform and configured them with the DCM, there is one parameter for the linecards that you must configure using the OneBox Configuration utility. For each line provided by the linecards, you must define the type of connection the line uses.

To configure the line type:

1. Log on to Windows NT Server with an account that has local Administrator privileges on the OneBox platform.

2. From the Start menu, point to Settings and select **Control Panel**.

3. In Control Panel, double-click the **OneBox Config.** icon.

4. In the OneBox Configuration dialog box, select the **Integration** tab.

5. In the Type box for one of the lines represented, select the type of connection used by the card that provides that line.
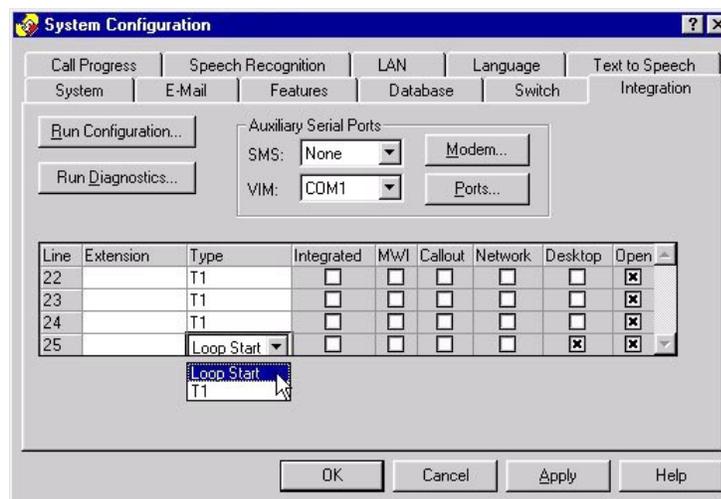
If the line is provided by a…	*Then…*
D/41EPCI	Select **Loop Start**.
D/120JCT-LS	Select **Loop Start**.
D/240PCI-T1	Select **T1**.

6. Repeat step 5 for each line on the OneBox system.

Setting the Signaling Protocol Used by D/240PCI-T1 Linecards

The default signaling protocol set by the Dialogic System Software for D/240PCI-T1 linecards is E&M wink-start signaling. This section explains how to create and configure a new system environment variable to accommodate T-1 carriers that require different signaling protocols. There are two separate T-1 protocol selections you must make for your system:

- E&M or FXS/FXO signaling

- Wink start or immediate start

In OneBox, E&M signaling defaults to wink start and FXS signaling defaults to immediate start. OneBox defaults to E&M signaling and must be changed to FXS signaling.

To change from E&M signaling to FXS signaling:

1. Log on to Windows NT Server with an account that has local Administrator privileges on the OneBox platform.

2. From the Start menu, point to Settings and select **Control Panel**.

3. In Control Panel, double-click the **System** icon.

4. At the System Properties dialog box, click the Environment tab.

5. From the System Variables list, select the first variable.

IMPORTANT

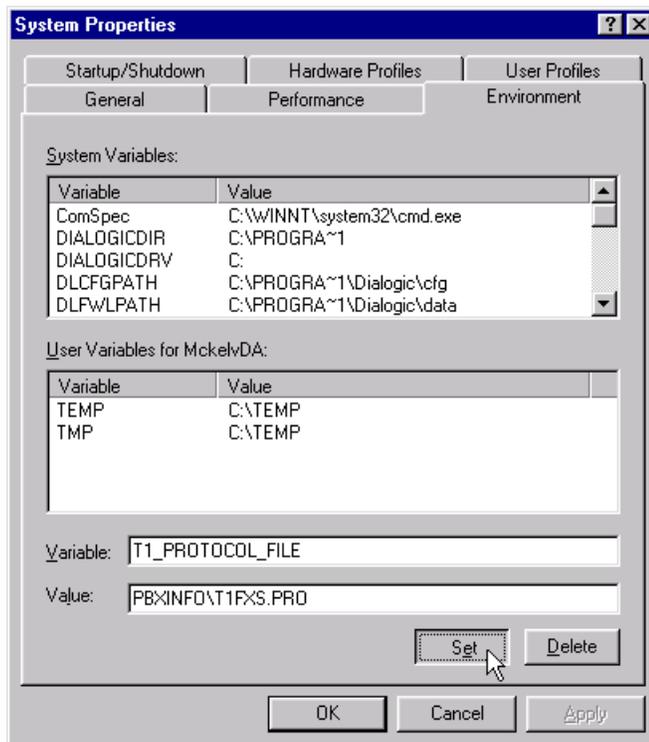**All variables described in this procedure are case sensitive.**

6. In the Variable box, type **T1_PROTOCOL_FILE**.

7. Configure the environment variable by entering the appropriate text in the **Value** box, as shown in the example below:

If protocol you want the
D/240PCI-T1 to use is…   *Then…*

E&M   In the Value box, type **PBXINFO\T1EANDM.PRO**

FXS/FXO   In the Value box, type **PBXINFO\T1FXS.PRO**

8. Click **Set**, then click **OK** to apply the changes you have made.

9. Restart the computer.

To change the signaling type:

1. Log on to Windows NT Server with an account that has local Administrator privileges on the OneBox platform.

2. Shut down OneBox.

3. Start Notepad or the text editor of your choice.

4. In the D:\Cx\Bin\Pbxinfo folder, open the file you want to edit, as shown in the example below.

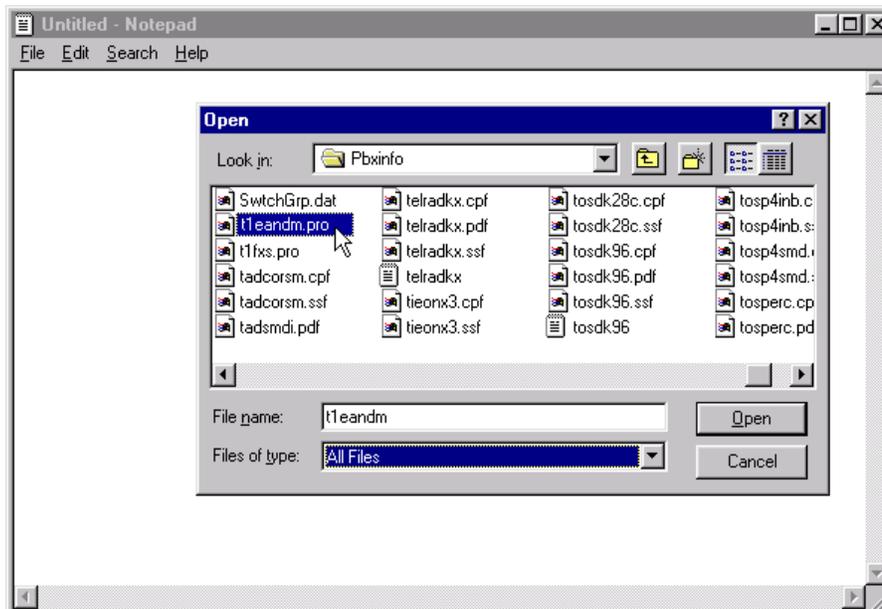| *If the signaling protocol used by the D/240PCI-T1 is…*	*Then…*
E&M	Open the file **t1eandm.pro**.
FXS	Open the file **t1fxs.pro**.

5. Edit the text in the **Start** = line, as show in the example below.

If the start mode used by the signaling protocol is…	*Then…*
Wink and you want to use immediate	Modify the Start = Wink line to **Start = Immediate**
Immediate and you want to use wink	Modify the Start = Immediate line to **Start = Wink**

IMPORTANT

Do not alter any other portion of this file unless directed to do so by Technical Support.

```
t1eandm.pro - Notepad                                    _ □ ✕
File  Edit  Search  Help
;     Transmit B on    - 2
;     Transmit C on    - 4
;     Transmit D on    - 8
;     Transmit all off - 0

;TRACE bits (in hex):
;     Trace off        - 0
;     Trace to file    - 1
;     Trace to screen  - 2


;****************************************************
;Start of actual protocol definition
;****************************************************

TRACE           = 0
START           = IMMEDIATE ; IMMEDIATE/WINK
RING            = 33         ; Receive A&B bits on
DISCONNECT      = 330        ; Receive A&B bits off
WINK            = 1000
OFFHOOK         = 3          ; Transmit A&B bits on
ONHOOK          = 0          ; Transmit A&B bits off
```

Edit this line ⟶

6. Save the text file, then restart OneBox.

Testing and Troubleshooting T-1 Equipment

If you encounter problems with T-1 equipment, we recommend segmenting the test procedure, which entails disconnecting all components and testing them individually. This section contains procedures for testing or troubleshooting the following components:

- The D/240PCI-T1

- The CSU

- The D/240PCI-T1–to–CSU and the CSU–to–T-1 connections

To test the D/240PCI-T1:

1. Remove the plug from the RJ-45/48C connector on the back of the D/240PCI-T1.

2. Plug a loopback plug into the RJ-48C connector of the D/240PCI-T1 (refer to "The Loopback Plug" for additional information).

3. Switch the loopback test switch SW500 to the Off or Loopback Mode position (refer to "The Remote Loopback Switch (SW500)" for details).

4. Choose one:

If the green LED at the back of the D/240PCI-T1 linecard is...	*Then…*
Lit	Continue to the procedure for testing the CSU.
Not lit	Verify that you have performed the procedures in this document correctly.

The Loopback Plug

You can purchase a loopback plug or build one. To build a loopback plug, cross-connect pins 1–4 and 2–5 on a linecord, as shown in Figure 14.
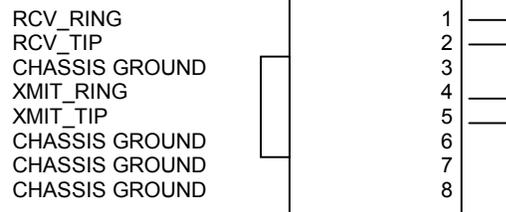
```
RCV_RING            1
RCV_TIP             2
CHASSIS GROUND      3
XMIT_RING           4
XMIT_TIP            5
CHASSIS GROUND      6
CHASSIS GROUND      7
CHASSIS GROUND      8
```

Figure 14. Loopback plug cross connections

The Remote Loopback Switch (SW500)

The Remote Loopback Switch is factory configured to the left (Off) position for normal mode (default), as shown in Figures 15. Once the firmware is downloaded, you can set the Remote Loopback Switch to the right (On) position for loopback mode, as shown in Figure 16. Loopback mode enables you to verify the T-1 connection. The switch overrides any board modes set by the Dialogic System Software. The Remote Loopback Test Indicator above the Remote Loopback Switch will light when the linecard is set to loopback mode.
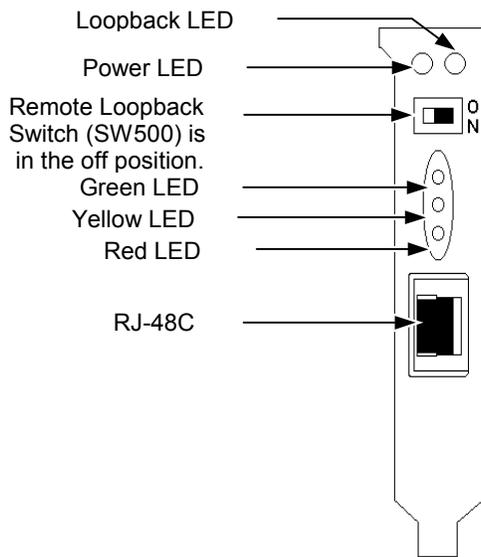
Loopback LED

Power LED

Remote Loopback
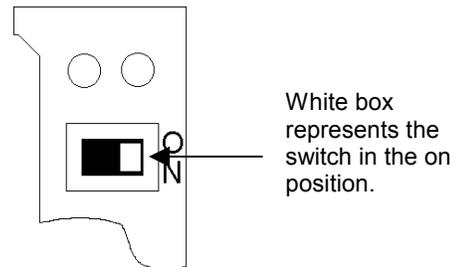Switch (SW500) is
in the off position.

Green LED

Yellow LED

Red LED

RJ-48C

White box
represents the
switch in the on
position.

**Figure 16. SW500 remote
loopback switch set to the
On position**

**Figure 15. Rear bracket of the
D/240PCI-T1**

To test the CSU:

1. Consult the documentation that accompanied the CSU or its manufacturer for instructions on testing the CSU.

2. Choose one:

If the CSU...	*Then…*
Passes the diagnostic tests specified by the manufacturer	Continue to the procedure for testing the D/240PCI-T1–CSU or the CSU–D/240PCI-T1 connection.
Does not pass the diagnostic tests specified by the manufacturer	You have determined the cause of the problem. Repair or replace the CSU (contact the manufacturer or vendor for instructions).

To test the D/240PCI -T1–CSU or the CSU–D/240PCI-T1 connection:

1. Switch the loopback test switch to the On or Normal Mode position (refer to "The Remote Loopback Switch (SW500)" for details).

2. Reconnect the D/240PCI-T1–to–CSU cable to the RJ-48C connector on the D/240PCI-T1 and the connector on the CSU.

3. Reconnect the CSU to the T-1 cable.

4. Watch the LEDs at the back of the D/240PCI-T1 linecard for error indications (refer to "LED Error Conditions" for specific information).

LED Error Conditions

The LEDs at the back of the D/240PCI-T1 will light when an error is encountered. The following section describes what error conditions will cause an LED to light and provides some troubleshooting advice.

Green LED

Signal present LED; indicates powered up and receiving signal from external T-1 source. However, this LED will light even if the tip and ring connections on the cable are miswired. If this LED is lit, but you are still getting errors from the network, verify that the tip and ring connections on your cable are wired correctly.

Yellow LED

Alarm to indicate loss of frame synchronization at the far end of the external network.

Green and Yellow LEDs

May indicate a short in the transmit wire pair (the pair connected to the transmit pins on the D/240PCI-T1). Remove the D/240PCI-T1–to–CSU cable and test it for shorts.

Red LED

Alarm to indicate loss of frame synchronization on the incoming line from the external network.

Red and Yellow LEDs

Red and yellow LEDs may light in the following conditions:

- The transmit and receive pairs between the CSU and the D/240PCI-T1 may be reversed. Check the D/240PCI-T1–to–CSU cable for incorrect connections. Consult your CSU documentation for proper pinouts and signal direction.

- You may have a short in the Receive wire pair (the pair connected to the receive pins on the D/240PCI-T1). Remove the D/240PCI-T1–to–CSU cable and test it for shorts.

T-1 Diagnostic Logging

Technical Support may ask you to configure the T1eandm.pro or T1fxs.pro file to log (trace) T-1 events to a file for troubleshooting purposes. This file is created in the D:\Cx\Bin directory as T1ctl.log. You can the copy this file and send it to Technical Support, if requested.

To start T-1 diagnostic logging:

1. Start Notepad or another text editor of your choice.

2. In the D:\Cx\Bin\Pbxinfo folder, open the appropriate file:

If the signaling used by the D/240PCI-T1 is…	*Then…*
E&M	Open the file **t1eandm.pro**.
FXS	Open the file **t1fxs.pro**.

3. Modify the Trace=0 line to Trace=**1**.

4. Save the file, then restart OneBox.