![ADTRAN PRACTICES logo]

C A U T I O N !
HANDLE SUBJECT TO ELECTROSTATIC DISCHARGE
OBSERVE PRECAUTIONS FOR HANDLING

HANDLING PRECAUTIONS REQUIRED

D4-OCU DP (ETR)
ALL-RATE OFFICE CHANNEL UNIT DATAPORT
WITH EXTENDED TRANSMIT RANGE
INSTALLATION/MAINTENANCE

CONTENTS

1. GENERAL

This practice has been reissued to correct enhanced Switch 56 references.

This practice is an installation and maintenance guide for the ADTRAN Office Channel Unit Dataport (D4-OCU DP) with Extended Transmit Range[1] (ETR). Figure 1 is an illustration of the unit. A detailed product description is found in ADTRAN D4-OCU DP Description Practice, Section 61107005L2-2.

The Office Channel Unit Dataport (OCU DP) allows access to the Dataphone® Digital Service (DDS) or Basic Digital Service using existing 4-wire metallic facilities and D4 channel banks equipped for dataport operation. In addition to this interchangeability, the ADTRAN D4-OCU DP contains the following enhancements:

• Extended loop range[2] (45 dB receiver range when operated at all rates)
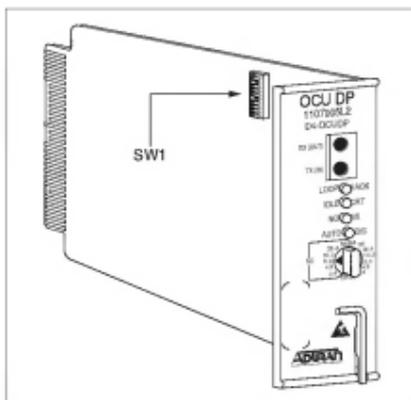
• Intermediate rate of 19.2 kbps; special format[3]

Figure 1. ADTRAN D4-OCU DP

• Switched 56 capability

• Latching and normal loopbacks

• Latching loopback capability in SW56 mode

• Loss of sealing current disconnect

• Poor loop signal quality disconnect

• Hardware signaling selection

• 45 dB range at all rates

• Faceplate Bantam jacks

• Four diagnostic faceplate indicators

• Extended transmit range

Furnished with common equipment and individual channel units, the D4 channel bank is a digital terminal providing multiple-channel access to T carrier lines. The dataport is a D4-type channel unit which allows direct digital access to a T carrier time slot, avoiding the normal analog-to-digital conversion required in a voice channel unit.

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[1] Covered under I.N.C. patent number 4,887,278
Dataphone is a registered trademark of AT&T
[2] Covered under ADTRAN patent number 4,759,035
[3] Covered under I.N.C. Patent No. 4,862,480

In the DDS system, an OCU DP located at an end office interfaces the customer to the T carrier system. A 4-wire loop is terminated at the customer premises by a data service unit (DSU) or a channel service unit (CSU). It can be used in the hub office, intermediate office, end office, or SLC® terminal to extend the DDS network to that office which has previously served voice channels equivalently.

The ADTRAN All-Rate Extended Range D4-OCU DP is interchangeable with AT&T units:

- Subrate OCU DP (J98726DB)
- 56 kbps OCU DP (J98726DE)
- All Rate OCU DP (J98726DJ)

The unit is also interchangeable with all previous and current ADTRAN units including the following:

- All-Rate OCU DP (1102005A)
- All-Rate with 38.4/64 kbps OCU DP (1102006A)
- All-Rate OCU DP (1104005L9)

2. INSTALLATION

After unpacking the unit, immediately inspect it for possible shipping damage. If damage is discovered, file a claim immediately with the carrier and contact ADTRAN Customer Service (see subsection 7).

The D4-OCU DP plugs directly into a WECO®, or equivalent, D4 channel bank. ADTRAN General Purpose Communication (GPC) shelves, or ADTRAN ACT-1241 channel bank. No installation wiring is required.

A sixteen-position rotary switch on the faceplate and an internal ten-position slide switch (SW1) must be set prior to installing the unit.

Sixteen-Position Rotary Faceplate Switch

The settings for the sixteen-position rotary switch select loop rates of 2.4, 4.8, 9.6,19.2, 38.4, 56, SW56, or 64 kbps, and Secondary Channel (SC). Set the switch functions as illustrated in Figure 2.

> NOTE When SW56 is selected, normal loopbacks are automatically disabled. Only latching loopback may be used at this rate. When SW56 is selected as the operating rate, SW1-1 must remain off.

SLC is a registered trademark of AT&T
WECO is a registered trademark of AT&T

> NOTE Shown with 9.6 kbps Secondary Channel selected. Two positions do not have rates associated with them. The D4-OCU DP will not function when these switch positions are set.
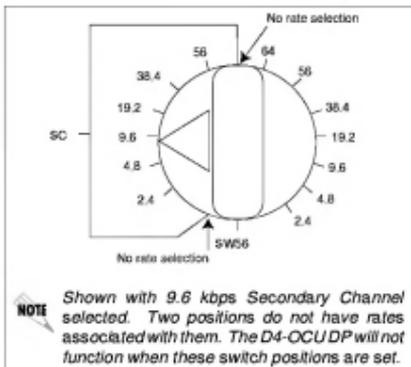
Figure 2. Rate Option Switch

Internal Switch Option Settings

The location of the ten-position slide switch is illustrated in Figure 3. The option settings are provided in Table B. SW1 is a ten-position slide switch which enables or disables error correction, bank type, zero code suppression, latching loopback, hardware A/B signaling, quality monitoring, and extended transmit range.

If more than one bank type is selected (on), the OCU DP will not function.

> CAUTION There are restrictions in the deployment of 38.4, 56, and 64 kbps with error correction in a D4 bank. When the dataport is configured for no error correction, a single timeslot is used and the unit may be located in any channel slot of the D4 bank. With 38.4, 56 and 64 kbps error correction selected, the dataport generates a parity byte for each data byte, thus occupying two timeslots. If the standard D4 38.4, 56 and 64 kbps error correction option is selected, the parity byte is inserted into the timeslot immediately following the data. The specific design of the D4 common equipment interacts with the error correcting schemes and imply the following deployment restrictions on a 38.4, 56 and 64 kbps dataport with error correction:
>
> a. All D4 Modes: Dataport may not be located in channel slot 24.
>
> b. D4 Modes 1, 2: Data and parity must be confined to groups of six channel slots (i.e., slots 1-6, 7-12, 13-18, or 19-24.)
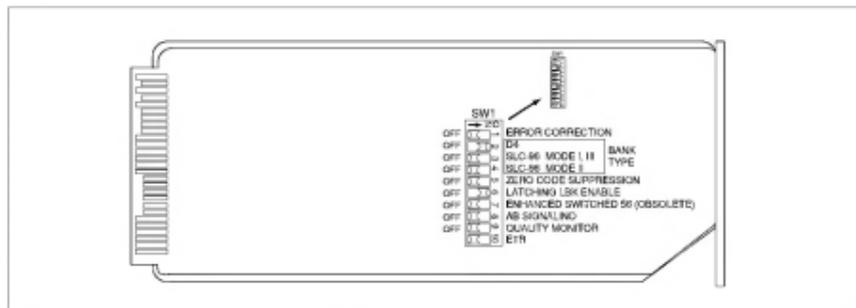
ADTRAN   Section 61107005L2-5, Issue 3

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               SW1
       OFF   ON  | 1 |  ERROR CORRECTION
       OFF   ON  | 2 |  D4
       OFF   ON  | 3 |  SLC-96 MODE I , II     BANK
       OFF   ON  | 4 |  SLC-96 MODE II         TYPE
       OFF   ON  | 5 |  SLC-96 MODE I
       OFF   ON  | 6 |  ZERO CODE SUPPRESSION
       OFF   ON  | 7 |  LATCHING LBK ENABLE
       OFF   ON  | 8 |  ENHANCED SWITCHED 56 (OBSOLETE)
       OFF   ON  | 9 |  A/B SIGNALING
       OFF   ON  |10 |  QUALITY MONITOR
       OFF   ON  |   |  ETR
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Figure 3. SW1

Table A. SW1 Option Settings

Switch	Function
SW1-1	On ... Activates error correction. Off ... Deactivates error correction.
SW1-2	On ... Selects D4 bank type. Off ... Unable to select D4 bank type.
SW1-3	On ... Selects SLC-96 bank, Mode I or III. Off ... Unable to select SLC-96 bank, Mode I or III.
SW1-4	On ... Selects SLC-96 bank, Mode II. Off ... Unable to select SLC-96 bank, mode II.
SW1-5	On ... Activates zero code suppression. Off ... Disables zero code suppression.
SW1-6	On ... Enables latching loopback. Off ... Disables latching loopback.
SW1-7	Leave switch in the off position to select SW56. Enhanced SW56 function has been obsoleted. Off ... Selects SW56 mode.
SW1-8	On ... Enables use of hardware A/B signaling bits in DS0. Off ... Disable hardware A/B signaling.
SW1-9	On ... Enables loop signal quality monitoring. Loop disconnects upon detection of poor signal quality. Off ... Disables loop signal quality monitoring.
SW1-10	On ... Enables extended transmit range. Transmit level is increased for 56 or 64 kbps loops with a loss in excess of 34 dB. Loss of switching current (open line) overrides ETR. Unit is shipped with this switch in the on position. Off ... Disables extended transmit range.

3.   CONNECTIONS

The OCU DP occupies one card position in the D4 channel bank. The connector pin assignments are detailed in Figure 4.

4.   TESTING

In the case of equipment malfunction, use the automated testing capability of the Serving Test Center (STC) or the faceplate test connectors with portable KS-20908/20909 or a functionally equivalent test set.

The faceplate contains Bantam jacks for manual testing (see ADTRAN D4-OCU DP Description practice, Section 61107005L2-2, Testing, for manual testing information).

Loopback Tests

OCU, channel, and optional DSU loopbacks, both normal and latching, may be activated by issuing the prescribed commands in accordance with TA-TSY-000077. The LOOPBACK LED is illuminated when OCU loopback or channel loopback is activated.
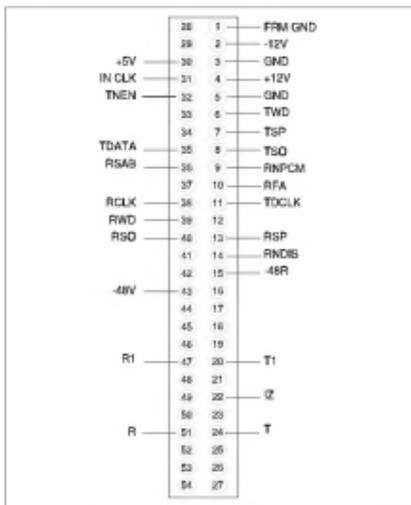
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              28 —— FRM GND
              29 —— -12V
     +5V  30 — 3 —— GND
   IN CLK  31 — 4 —— GND
     TNEN  32 — 5 —— GND
              33 — 6 —— TWD
   TDATA  34 — 7 —— TSP
    RSAB  35 — 8 —— TSO
              36 — 9 —— RNPCM
    RCLK  37 — 1 —— TDCLK
     RWD  38 — 12 ——
     RSO  39 — 13 —— RSP
              40 —
              41 — 14 —— RNDIS
              42 — 15 —— -48R
    -48V  16 — 17
              43 — 18 — 19
      R1  47 — 20 —— T1
              46 — 21 —
       R  48 — 22 —— T
              49 — 23
       R  51 — 24 —— T
              50 —
              53 — 25
              54 — 27
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Figure 4. Connector Pin Assignments

Faceplate Indicators

The OCU DP has four faceplate LED indicators as follows:.

LOOPBACK .... On for OCU or channel loopback.

IDLE CKT .... On for inactive data channel. Detects the reception of the idle sequence from the loop side (DSU/CSU to OCU).

NO SX .... On for no sealing current. Indicates detection of no sealing current on the loop.

AUTO DIS .... On for auto disconnect. Indicates a loop disconnect due to poor signal quality.

5.   AUTO LOOP DISCONNECT

On multi-point networks, failure of a single node can cause the entire network to be inoperable. To prevent this, the D4-OCU DP incorporates an auto loop disconnect feature. Loop disconnect occurs when sealing current is absent or the quality monitor threshold is exceeded.

If the quality monitoring option is enabled and poor received signal quality is detected, the loop will be disconnected and abnormal station control code (1001 1110) will be sent toward the network.

This will cause the branch to be blocked at the next junction (MJU or QMJU). The D4-OCU DP detects poor received signal quality on the loop by monitoring for illegal bipolar violations.

6.   MAINTENANCE

The D4-OCU DP requires no routine maintenance to operate properly. In case of equipment malfunction, use the faceplate test connector and indicators to determine the trouble source. The faceplate of the D4-OCU DP contains Bantam test jacks for the KS-20908/20909 or a functionally equivalent test set. All units contain LEDs as described in subsection 4.

ADTRAN does not recommend that repairs be performed in the field. Repair services may be obtained by returning the defective unit to the ADTRAN Repair Department (see subsection 7).

7.   WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within ten years from the date of shipment, if the product does not meet its published specifications or if it fails while in service. For detailed warranty, repair, and return information, refer to the ADTRAN Equipment Warranty and Return Policy and Procedure.

Return Material Authorization (RMA) is required prior to returning equipment to ADTRAN. ADTRAN does not recommend that repairs be performed in the field.

For service, RMA requests, or further information, contact one of the following numbers: