# ADTRAN

# Nx/DBU

## Plug-On Board Option Module

**User Manual**

**Part Number
1200174L1**

| **NOTE** | *Notes provide additional useful information.* |
|---|---|

| **CAUTION** | *Cautions signify information that could prevent service interruption* |
|---|---|

| **WARNING** | *Warnings provide information that could prevent damage to the equipment or endangerment to human life.* |
|---|---|

**Federal Communications Commission Radio Frequency Interference Statement**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio frequencies. Operation of this equipment in a residential area is likely to cause  harmful interference in which case the user will be required to correct the interference at his own expense.

***Shielded cables must be used with this unit to ensure compliance with Class A FCC limits.***

**CAUTION**

*Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

# Warranty and Customer Service

ADTRAN will replace or repair this product within five (5) years from the date of shipment if it does not meet its published specifications or fails while in service. For detailed warranty, repair and return information See the ADTRAN Equipment Warranty and Repair and Return Policy Procedure.

Return Material Authorization (RMA) is required prior to returning equipment to ADTRAN.

For Service, RMA requests, or more information, contact ADTRAN Technical Support listed on the inside back page of this  manual.

## LIMITED PRODUCT WARRANTY

ADTRAN warrants that for five (5) years from the date of shipment to Customer, all products manufactured by ADTRAN will be free from defects in materials and workmanship. ADTRAN also warrants that products will conform to the applicable specifications and drawings for such products, as contained in the Product Manual or in ADTRAN's internal specifications and drawings for such products (which may or may not be reflected in the Product Manual). This warranty only applies if Customer gives ADTRAN written notice of defects during the warranty period. Upon such notice, ADTRAN will, at its option, either repair or replace the defective item. If ADTRAN is unable, in a reasonable time, to repair or replace any equipment to a condition as warranted, Customer is entitled to a full refund of the purchase price upon return of the equipment to ADTRAN. This warranty applies only to the original purchaser and is not transferable without ADTRAN's express written permission. This warranty becomes null and void if Customer modifies or alters the equipment in any way, other than as specifically authorized by ADTRAN.

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Nx/DBU Plug-On Board User Manual

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Chapter 1     # Introduction

## NX/DBU V.35 PLUG-ON BOARD OVERVIEW

The Nx/DBU V.35 plug-on board is available for use with any option module with the following TSU units:

- TSU 100
- TSU 120
- TSU 600
- TSU 610

The Nx/DBU V.35 plug-on board installs on any option module in the option slot of the TSU units and provides an additional synchronous V.35 interface port with dial backup capability. When used in these products, this interface port allows an additional DTE to have access to the T1 service with dial backup capability in the event of a T1 failure.

The Nx/DBU plug-on board has a special Y cable that it uses to break apart the Nx and DBU ports from the single V.35 connector. The longer (2 ft.) side of the Y, with the male connector, provides connection to the DBU. The shorter (1 ft.) side, with the female connector, provides access to the Nx port.

In the remainder of this manual, the board will be called the Nx/DBU plug-on board.

# FUNCTIONAL DESCRIPTION

The Nx/DBU plug-on board operates on an option module of the TSU units and is under the control of the TSU. The Nx/DBU plug-on board is configured from the front panel or by an external PC program. The internal menus for their configuration are part of the Nx/DBU plug-on board and are automatically installed when the Nx/DBU is installed in a TSU unit.

## Features

### Nx Features

The general features of the Nx are listed below:

- Data rates from 56 kbps to 2.048 mbps in 56K or 64K increments
- Includes an elastic store for adsorption of rate variations
- Executes and responds to V.54 looping codes
- Outputs a 50% duty cycle output clock at all rates
- Provides an inband control channel (8 kbps for network management communication)
- Generates and checks 511 test pattern toward network
- 511 pattern generator is capable of injecting errors

### DBU Features

The following are general features of the DBU:

- Capable of verifying integrity of dial up network with a test pattern without disrupting T1 data
- Detect no data transitions on the data received from the network, with verify over inband channel
- User definable delay between call retries if backup connection is not successfully established

- User definable verification of dial up network (daily, weekly, or on command) without T1 data disruption
- Backup can be initiated by:
    - Alarm conditions on network (AIS, RAI, or Red Alarm)
    - Absence of data transitions for a user-defined delay
    - Uses 8 kbps channel to check end-to-end connectivity before activating backup
    - Disable backup based on hour of day and weekend
    - Uses pattern to validate backup dial network

**Features Common to the Nx and the DBU**

The following features are common to the Nx and the DBU:

- Configurable by using a PC program (T-Watch)
- Menu operation for easy configuration
- Performs self-test of option card hardware
- Install multiple Nx/DBU modules in a TSU 600
- Hot swappable

**Interfaces**

The following interfaces are used with the Nx/DBU:

- Two CCITT V.35 electrical (differential)
- One V.35 Winchester connector

# SPECIFICATIONS OF THE NX/DBU

## Specifications:  Nx56/64 (DCE Interface)

| | |
|---|---|
| **DCE Interface** | CCITT V.35 synchronous |
| **Rates** | 56 kbps to 2.048 mbps in 56K or 64K increments |
| **Clock Options** | Internal or internal-invert |
| **Tests** | Local loopback (bilateral) Remote loopback (V.54) |
| **Test Pattern** | 511 with errored seconds display and error inject capability |
| **Data Inversion** | Menu selectable |
| **1s Density Protection** | Force 1s to network after one second of consecutive zeros from DTE User selectable (On/ Off) |
| **CTS, DCD, DSR** | Normal or Force On |
| **Connector** | Winchester (V.35), female |

## Specifications: Nx/DBU (DTE Interface)

| | |
|---|---|
| **DTE Interface** | CCITT V.35 synchronous |
| **Backup Delay** | 1 sec, 3 sec, 10 sec, 30 sec, 1 min, 5 min, 10 min |
| **DBU Dialing** | DTR dialing |
| **Restore Delay** | 1 sec, 3 sec, 10 sec, 30 sec, 1 min, 5 min, 10 min, Never |
| **Rates** | 56 kbps through 2.048 mbps in 56K or 64K increments |
| **Clocking** | Routes external DCE clocks to external DTE when active |
| **Connector** | Winchester (V.35) female |
| **Test** | Loopback to DCE<br>Test dialup network<br>Force dial backup |

## Specifications:  Nx56/64 and DBU

| | |
|---|---|
| **Mechanical** | Mechanically compatible with option slot of all TSUs |
| **Environmental** | Operating temperature from 0°C to 45°C |
| **Tests** | Extensive self-test |

## PHYSICAL DESCRIPTION

The Nx/DBU plug-on board plugs onto any option module used by the TSU family of products (see Figure 1-1).

The PORT X.2/3 indication is linked to the port numbering philosophy of the TSU product family. The X represents the slot number into which the plug-on board is plugged. The 2/3 indicates which port the plug-on board occupies. The port number will be 2 or 3, depending on the option module used.

The TSU 100 has one option slot; therefore the port designation is 1.2/3.

The TSU 120 has one option slot; therefore the port designation is 1.2/3.

The TSU 600 and the TSU 610 each have six option slots; therefore the port numbers would be port 1.2/3 to port 6.2/3. The numbers appear in the front panel LCD menu display.
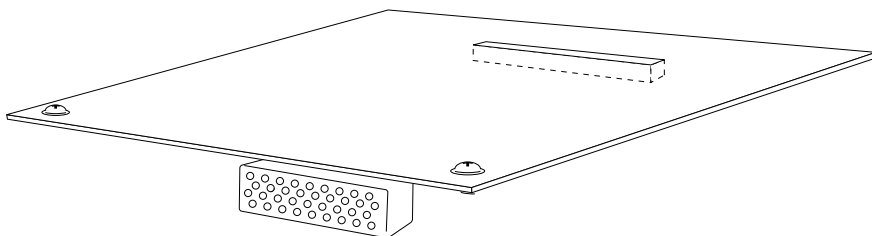


**Figure 1-1. Nx/DBU Plug-on Board**

Chapter 2     # Installation

## UNPACK & INSPECT

Carefully inspect the plug-on board for any shipping damage. If damage is suspected, file a claim immediately with the carrier and then contact ADTRAN customer service. If possible, keep the original shipping container for use in shipping the plug-on board back for repair or for verification of damage during shipment.

## ADTRAN Shipments Include

- The Nx/DBU Plug-on Board
- The *Nx/DBU Plug-on Board User Manual* (to be inserted into main TSU user manual)
- The Y cable used to break apart the V.35 and DBU connections

## Customer Provides

- DTE cable
- DCE cable

# ATTACHING THE PLUG-ON BOARD

## Placement of the Plug-on Board

Figure 2-1 shows the proper placement of the plug-on board to the option module. Perform the following steps to install the plug-on board:

1. Hold the plug-on board above the option module.
2. Using a downward and right to left motion, slip the V.35 connector plug into the opening in the option module back panel.
3. Moving the plug-on board downward, secure the connection of the header pins at the front of the boards.
4. Install the two 4-40 screws at both edges of the option module.
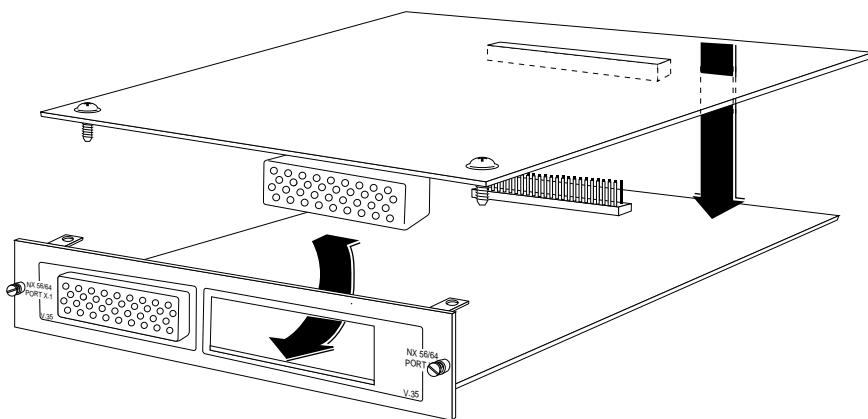


**Figure 2-1.  Attaching the Plug-on Board**

**WARNING** *The connection of the header pins between the option module and the plug-on board must be visually verified.  Improper connections can severely damage the equipment.*

## WIRING

The Nx/DBU plug-on board  has one V.35 Winchester-style connection.  The Nx  and DBU connection is defined in Table 2-1, below, and Table 2-2 on page 2-4.

**Table 2-1. Nx/DBU Pin Connection**

| Pin | CCITT | Description |
|-----|-------|-------------|
| A | 101 | Protective ground (PG) |
| B | 102 | Signal ground (SG) |
| C | 105 | Request to send (RTS) from DTE |
| D | 106 | Clear to send (CTS) to DTE |
| E | 107 | Data set ready (DSR) to DTE |
| F | 109 | Received line signal detector (DCD) to DTE |
| R | 104 | Received data (RD-A) |
| T | 104 | Received data (RD-B) |
| V | 115 | RX clock (RC-A) to DTE |
| X | 115 | RX clock (RC-B) to DTE |
| P | 103 | Transmitted data(TD-A) from DTE |
| S | 103 | Transmitted data(TD-B) from DTE |
| Y | 114 | TX clock (TC-B) to DTE |
| AA | 114 | TX clock (TC-B) to DTE |
| U | 113 | External TX Clock (TC-A) from DTE |
| W | 113 | External TX clock (ETC-B) from DTE |
| NN | - | Test mode (TM) to DTE |

**Table 2-2. DBU V.35 Winchester Pin Connection**

| Pin | CCITT | Description |
|:---:|:---:|:---|
| A | 101 | Protective ground (PG) |
| B | 102 | Signal ground (SG) |
| J | 105 | Request to send (RTS) from DCE |
| M | 106 | Clear to send (CTS) from DCE |
| N | 107 | Data set ready (DSR) from DCE |
| BB | 109 | Received line signal detector (DCD) from DCE |
| MM | - | Data terminal ready (DTR) to DCE |
| Z | - | Ring indicator (RI) from DCE |
| DD | 104 | Received data (FD-B) from DCE |
| FF | 104 | Received data (RD-B) from DCE |
| HH | 115 | RX clock (R-B) from DCE |
| JJ | 115 | RX clock (RC-B) from DCE |
| CC | 103 | Transmitted data (TD-A) to DCE |
| EE | 103 | Transmitted data (TD-B) |
| KK | 114 | TX Clock (TC-A) from DCE |
| LL | 114 | TX clock (TC-B) from DCE |

The Nx/DBU Plug-on board cable assembly is shown in Figure 2-2. The schematic for this cable assembly is shown in Figure 2-3 on page 2-6.
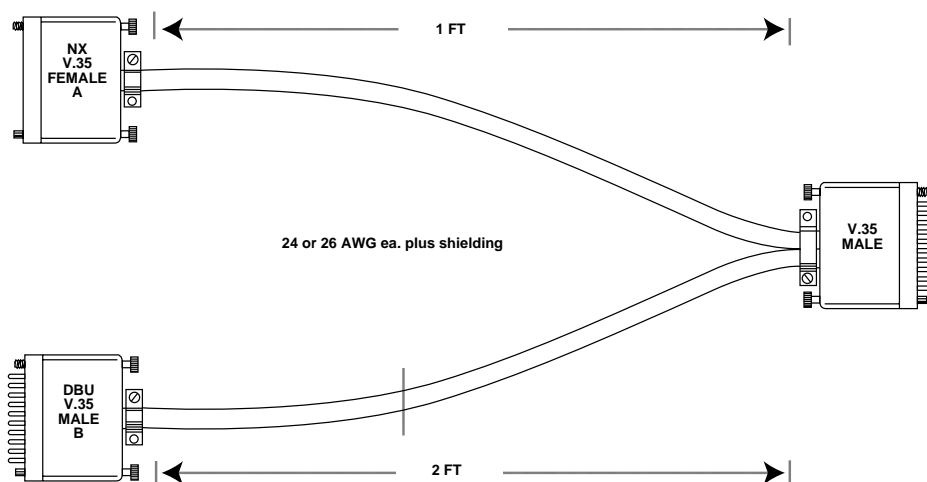


**Figure 2-2.  Nx/DBU Plug-On Board Cable Assembly**
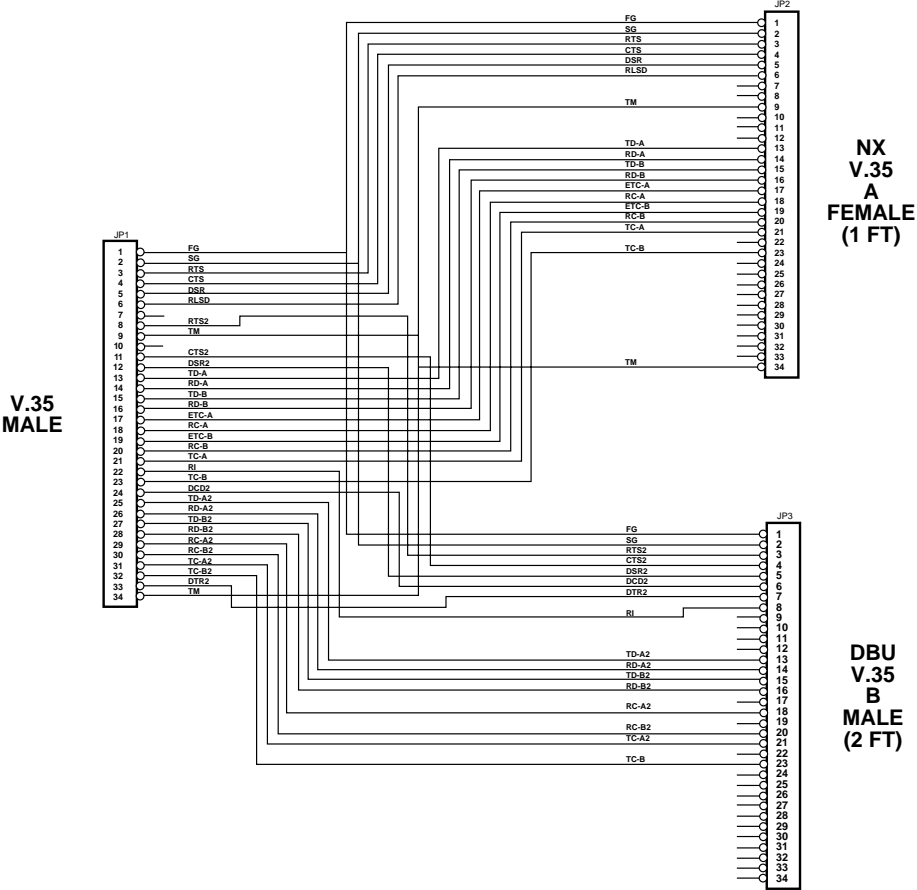
**Figure 2-3. Nx/DBU Plug-On Board Cable Schematic**

## POWER-UP TESTING AND INITIALIZATION

The plug-on board executes a self-test during the power-up sequence, as described in the TSU manual. No initialization input is required. Upon power-up, any previously configured setting for the plug-on board is automatically restored.

When self-testing is completed and configuration is successfully restored, the LED labeled **OK** in the MODULE group on the front panel turns **ON**. If any alarms are detected during operation, the red LED labeled **ALARM** in the MODULE group on the front panel turns **ON**.

For more information about the front panel, see the *Operation* chapter of the appropriate TSU user manual.

Chapter 3 # Installation

## OVERVIEW

The Nx/DBU plug-on board is controlled as part of the TSU using the same methods as described in the appropriate TSU User Manual.

## Front Panel Indicators/Buttons

Refer to the description of the TSU front panel indicators and buttons in the appropriate TSU User Manual.

## Menu Structure

The Nx/DBU plug-on board menus appear as a subset of, and operate the same as, menus for the TSUs. The menus are accessed by selecting 1.1 Nx/DBU under the PORT menu items.

The main menu for the TSU 100 is used for illustrative purposes. The main menus for the other TSU units operate in a similar way. Figure 3-1 on page 3-2 shows the TSU 100 main menu with the PORT 1.1 Nx/DBU menu items printed in bold italicized letters.

Complete menu trees for each TSU product is found in their respective user manuals.

| | | | |
|---|---|---|---|
| | | | 1) NI PERF REPORTS |
| | 1) STATUS | | 2) NI ERRORS |
| | | | 3) ACTIVE ALARMS |
| | | 1) NETWORK (NI) | 4) VIEW HISTORY |
| | 2) CONFIG | 2) UNIT | *5)PORT STATUS* |
| TSU 100 | | 3) MAP XCHNG | |
| MAIN MENU | | 4) MAP IN USE A(B) | |
| | | 5) DS0 MAP A | 1) TIME/DATE |
| | | 6) DS0 MAP B | 2) FACTORY RESTORE |
| | | *7) PORT CONFIG* | 3 SET PASSCODE |
| | | | 4) UNIT ID |
| | 3) UTIL | | 5) PORT UTILITY |
| | | | 6) SOFTWARE REV |
| | | 1) NETWORK TESTS | 7) ENET ADDRESS |
| | | *2) RUN SELF-TEST* | 8) SERIAL NUMBER |
| | 4) TEST | *3) PORT TEST* | |
| | | 4) CANCEL TEST | |

**Figure 3-1. TSU 100 Main Menu Tree**

## Nx/DBU Menus Are All Submenus

The Nx/DBU plug-on board menus are accessed from and operated the same as menus for the TSU 100. Menu items in the main menu in Figure 3-1 printed in bold italics are submenu choices for the Nx/DBU plug-on board. See Figure 3-2 for the menu tree for each of these submenu options. Each of the these submenu items is discussed in the following paragraphs. All are accessed by the same method.

### Operation

With the cursor on one of the four main menu choices, press **Enter** or the **number** key. The results are the first two submenu items with the cursor on the first item. Use the **Scroll Down** key to place the cursor on the desired item then press **Enter**. This displays the first two submenu choices.
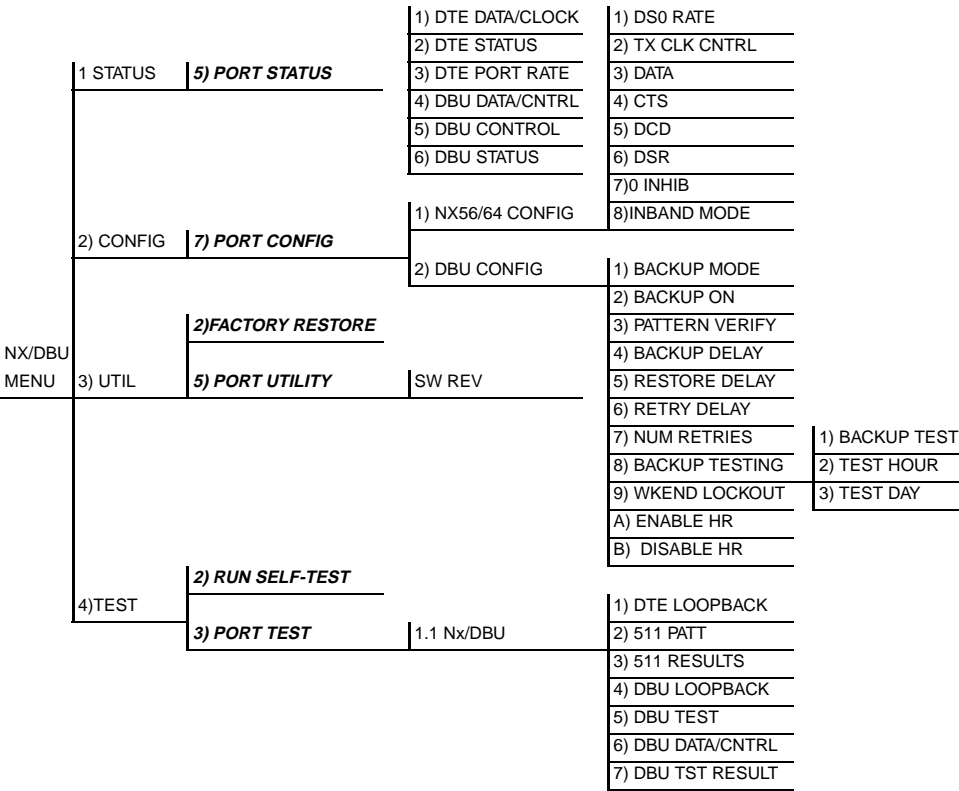
| | | 1) DTE DATA/CLOCK | 1) DS0 RATE |
| | | 2) DTE STATUS | 2) TX CLK CNTRL |
| 1 STATUS | 5) PORT STATUS | 3) DTE PORT RATE | 3) DATA |
| | | 4) DBU DATA/CNTRL | 4) CTS |
| | | 5) DBU CONTROL | 5) DCD |
| | | 6) DBU STATUS | 6) DSR |
| | | | 7)0 INHIB |
| | | 1) NX56/64 CONFIG | 8)INBAND MODE |
| 2) CONFIG | 7) PORT CONFIG | | |
| | | 2) DBU CONFIG | 1) BACKUP MODE |
| | 2)FACTORY RESTORE | | 2) BACKUP ON |
| | | | 3) PATTERN VERIFY |
| NX/DBU | | | 4) BACKUP DELAY |
| MENU | 3) UTIL | 5) PORT UTILITY | SW REV | 5) RESTORE DELAY |
| | | | 6) RETRY DELAY |
| | | | 7) NUM RETRIES | 1) BACKUP TEST |
| | | | 8) BACKUP TESTING | 2) TEST HOUR |
| | | | 9) WKEND LOCKOUT | 3) TEST DAY |
| | | | A) ENABLE HR |
| | | | B)  DISABLE HR |
| | 2) RUN SELF-TEST | | |
| 4)TEST | | | |
| | 3) PORT TEST | 1.1 Nx/DBU | 1) DTE LOOPBACK |
| | | | 2) 511 PATT |
| | | | 3) 511 RESULTS |
| | | | 4) DBU LOOPBACK |
| | | | 5) DBU TEST |
| | | | 6) DBU DATA/CNTRL |
| | | | 7) DBU TST RESULT |

**Figure 3-2.  Nx/DBU Plug-On Board Menu Tree**

The Nx/DBU plug-on board menu tree selections are discussed on the following pages.

## PORT STATUS, SUBMENU OF STATUS

The Status menu branch provides the ability to view the status of the TSU 100 operation. It displays the status of the monitored signal line on the Nx/DBU plug-on board and the data rate for which the plug-on board is configured.

## Operation

To display Figure 3-3 on the TSU 100, place the cursor on **STATUS** and do the following:

1. Press **Enter** or the number **1** key. This displays the first two Status submenu items with the cursor on **NI PERF RPTS**.

2. Use the **Scroll Down** key to place the cursor on **PORT STATUS** and press **Enter**. This displays the first available port.

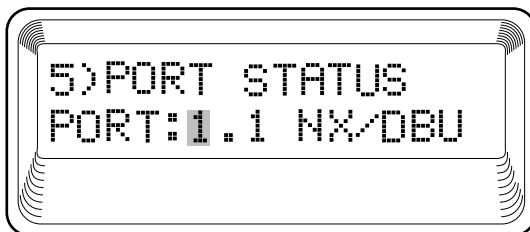3. Use the scroll keys to identify **1.1 Nx/DBU** and press **Enter**.

```
5>PORT STATUS
PORT:1.1 NX/DBU
```

**Figure 3-3. Port Status Submenu**

The base Nx interface shows the status screens listed in this manual. For other plug-on boards, refer to the appropriate TSU User Manual.

# Nx/DBU Status Menu Options

Select **1.1 Nx/DBU**. The following five menu options are available:

### DTE DATA/CLOCK

Shows the status (active or not active) of the following lines:

| | |
|---|---|
| **TXD** | Transmit data to the DTE |
| **RXD** | Receive data from the DTE |
| **ETC** | External transmit clock from DTE |
| **LCK** | Lock status of the phase locked loop |

### DTE STATUS

Shows the status (active or not active) of the following lines:

| | |
|---|---|
| **RTS** | Request to send from DTE |
| **CTS** | Clear to send to DTE |
| **DCD** | Data carrier detect to DTE |
| **DSR** | Data set ready to DTE |

### DTE PORT RATE

Displays the data rate to which the Nx port is set.

### DBU DATA/CNTRL

Shows the status (active or not active) of the following lines:

| | |
|---|---|
| **TXD** | Transmit data to the DCE |
| **RXD** | Receive data from the DCE |
| **DCD** | Data carrier detect from DCE |
| **RI** | Ring indicate from DCE |

## DBU CONTROL

Shows the status (active or not active) of the following lines:

**RTS**  Request to send to DCE

**CTS**  Clear to send from DCE

**DTR**  Data terminal ready to DCE

**DSR**  Data set ready from DCE

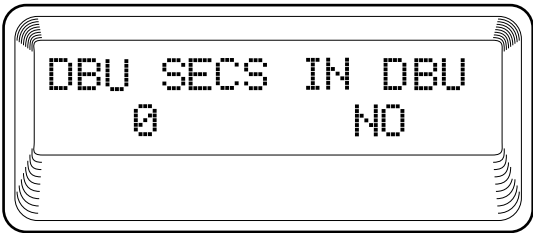## DBU STATUS

Shows current backup state (see Figure 3-4).

```
DBU  SECS   IN DBU
     0          NO
```

**Figure 3-4.  DBU Status Submenu**

**DBU SECS**  Total seconds the plug-on board has been in backup.

**IN DBU - YES**  Module is in backup mode.

**- NO**  Module is not in backup mode

Exit the displays as described in the appropriate *TSU User Manual.*

## PORT CONFIG, SUBMENU OF CONFIG

The **PORT CONFIG** submenu is used for configuration of the Nx/DBU plug-on board.

### Operation

To display Figure 3-5 on the TSU 100, place the cursor on **CONFIG** and do the following:

1. Press **Enter** or the number **2** key. This displays the first two Configuration submenu items with the cursor on **NETWORK (NI)**.

2. Use the **Scroll Down** key to place the cursor on **PORT CONFIG** and press **Enter**.

3. Use the scroll keys to identify the **1.1 Nx/DBU** plug-on board. Only the bottom line of the display changes.

```
7)PORT CONFIG
PORT:1.1 NX/DBU
```
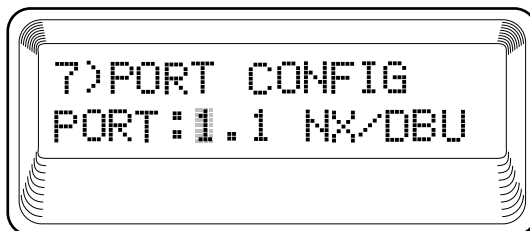
**Figure 3-5. Port Configuration Submenu**

To select **PORT CONFIGURATION**, press **Enter**. This displays the following menu options:

• Nx56/64 CONFIG
• DBU CONFIG

Place the cursor over the desired option and press **Enter** to configure. Menu options for the Nx56/64 and the DBU are shown on the following pages.

# Nx56/64 CONFIG Menu Options

Select the **Nx56/64** menu option to access the following eight menu options:

### DS0 RATE

This sets the base rate of the interface. The actual data rate depends on the number of DS0s assigned to the DTE Data Rate Chart in the appropriate *TSU User Manual.*
Choices - 56K or 64K

### TX CLK CNTRL

Controls the clock used by the TSU 100 to accept the transmit (TX) data from the DTE. Normally this is set to **INTERNAL**. If the interface cable is long, causing a phase shift in the data, the clock can be selected as **INT/INV** (**INTERNAL/INVERTED**). This switches the phase of the clock which should compensate for a long cable.
Choices - Normal or Invert

### DATA

Used to control the inverting of the DTE data. This inversion can be useful when operating with a high level data link (HDLC) protocol. Often used as a means to ensure 1s density.
Choices - Normal or Invert

Table 3-1 shows the conditions which cause the port control signal to be deactivated.

**Table 3-1. Normal Mode Operation**

| Signal | RTS | V.54 Loopback | 511 Test On | Self-Test Active | Network Test Active | NO DS0 Mapped | Network Alarm* |
|--------|-----|---------------|-------------|------------------|---------------------|---------------|----------------|
| CTS | Follows | Off | Off | Off | Off | Off | Off |
| DCD | - | - | - | Off | - | Off | Off |
| DSR | - | Off | Off | Off | Off | Off | - |
| | | | | | | | |
| - Do not care | | | | | | | |
| * Until backup becomes active | | | | | | | |

**CTS**

Used to control characteristics of CTS.
Choices - Normal or Force On (see Table 3-1 on page 3-8).

**DCD**

Data Carrier Detect - Indicates to the DTE when a valid
signal is being received at the Network Interface.
Choices - Normal or Force On (see Table 3-1 on page 3-8).

**DSR**

Data Set Ready - This signal indicates to the DTE when
the DCE is turned on and ready for operation.
Choices - Normal or Force On (see Table 3-1 on page 3-8).

**0 INHIB**

If the Nx interface detects an uninterrupted string of -0s
being transmitted toward the network, and if 0s are trans-
mitted for more than one second, then the TSU 100 forces
1s towards the network.
Choices - On or Off

**INBAND MODE**

Inband Configuration Channel - Used to enable/disable
an 8 kbps remote configuration channel (see Figure 3-6 on
page 3-10).

When this option is set to On, the first DS0 mapped to the
Nx interface operates in 56K mode and the DTE clock rate
is reduced by 8 kbps. The TSU uses this 8 kbps channel to
send and receive configuration data across a T1 span. As
shown in Figure 3-6, this allows the PC connected to the
chain-in port on TSU 600 A to monitor/configure both
TSU 600 A and B. This feature is useful when FDL con-
nectivity is not available across the T1 span.

This 8 kbps channel is only taken out of the first DS0. If
two 64K DS0s are mapped, the DTE rate would be 120
kbps instead of 128 kbps.
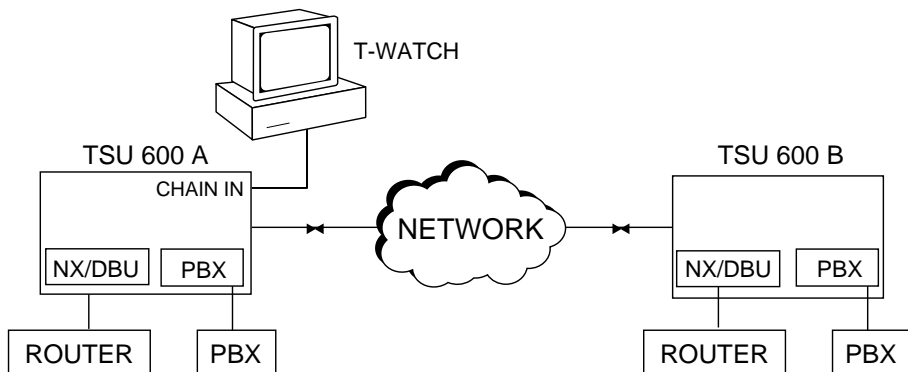
**Figure 3-6.  Inband Remote Configuration**

If the inband configuration channel is enabled, the Nx/ DBU will use the channel to verify end-to-end connectivity of the T1 network.  This provides more robust monitoring of the primary network.  This is especially useful in networks where alarms are not passed end-to-end.

## DBU CONFIG Menu Options

Select the **DBU CONFIG** menu option to access the 11 menu options discussed in this section.

### BACKUP MODE

The DBU can activate backup in two basic modes:  SINGLE END FAILURE or BOTH END FAILURE.  These can be used to control how calls are established and which end initiates the dialing process.
Choices: DISABLE, ORIGINATE, ANSWER, ORIG/ANS ANY

### SINGLE END FAILURE
In this mode, a backup condition detected at either end of the circuit causes a backup to be activated. The DBU at the failed end initiates a call to the opposite end which goes into backup mode upon receiving a call. This is particularly useful for Fractional T1 applications where a failure at one end cannot be reported to the other end.
Choices: Mode: ORIG/ANS ANY

**CAUTION** *In this mode, if the unit has Pattern Verify turned Off, it will go into backup mode on any received call, even a wrong number.*

### BOTH END FAILURE
In this mode, both ends of the circuit must detect backup conditions before backup is activated. One DBU is set to **ORIGINATE** and the other to **ANSWER**. Upon a network failure, only the Originate DBU initiates backup by dialing the Answer end. Once called, the Answer DBU goes into backup mode only if a backup condition is detected. This is ideal for controlling where calls originate.
Choices: Mode: ORIGINATE or ANSWER

## BACKUP ON

This selects the conditions that cause the Nx/DBU to initiate Backup.
Choices: NET FAIL, NET/DATA FAIL

### NET FAIL
Backup occurs on RED ALARM, YELLOW ALARM, BLUE ALARM, AND LOS.

### NET/DATA FAIL
Backup occurs on the same conditions as NET FAIL plus loss of data transitions on the data the Nx56/64 receives from the network.

## PATTERN VERIFY

This selects whether or not the DBU will use its pattern generator and receiver to authenticate backup attempts. When the local and remote units are both Nx/DBUs, set this to Enable; otherwise set this to disable.
Choices: ENABLE, DISABLE

## BACKUP DELAY

This selects the time allowed to elapse between the network going into alarm or no data transmissions and the backup beginning.
Choices: 1 sec, 3 sec, 10 sec, 30 sec, 1 min, 5 min, 10 min

## RESTORE DELAY

This selects the time that elapses between the network going out of alarm or data and the backup call being taken down. If never is selected, the user must deactivate the backup mode.
Choices: 1 sec, 3 sec, 10 sec, 30 sec, 1 min, 5 min, 10 min, never

## RETRY DELAY

This selects the time between redialing the external DCE after failed dial attempts.
Choices: 10 sec, 30 sec, 1 min, 5 min, 10 min

## NUM RETRIES

This selects the number of times the DBU will attempt to redial if unable to connect.
Choices: none, unlimited, 3 times, 10 times

## BACKUP TESTING

This submenu sets the options for the automatic ISDN **BACKUP TESTING**:

This submenu sets the options for the automatic ISDN verification feature of the Nx/DBU. Verification of the backup circuit does not disrupt data on the T1.

### BACKUP TEST
This selects the frequency of automatic backup circuit verification by the DBU.
Choices:  MANUAL, HOURLY, DAILY, WEEKLY

### TEST HOUR
This selects the hour of the day the backup test will occur.
Choices:  0 to 23

### TEST DAY
If weekly backup test is selected, this option will select which day to perform the test.
Choices: MONDAY through SUNDAY

## WKEND LOCKOUT
If no backup is desired from midnight Friday to midnight Sunday, set this selection to **ON**, otherwise set to **OFF**.
Choices: ON, OFF

## A) ENABLE HR:  (0-23)
The hour that the backup will be enabled can be entered from the numeric keyboard.

## B) DISABLE HR:  (0-23)
The hour that the backup will be disabled can be entered from the numeric keypad.

---

**NOTE**

*For items A and B to function properly, verify that the time and date in the TSU are set correctly.  Consult the appropriate TSU User Manual for instructions on setting date and time.*

---

## C) Trap in DBU
If traps are enabled (see unit configurations), this parameter will send either a single trap upon going into a DBU session or send repeated traps for the duration of the DBU session.
Choices: Single, Repeated

---

## FACTORY RESTORE, SUBMENU OF UTIL

This selection is used to restore the factory default settings for all pass-through plug-on board parameters.

## Operation

To return the unit to the opening main menu with all the factory default settings restored, do the following:

1. Follow the standard operating procedure to access the **UTIL** menu items.
2. With the cursor on **FACT RESTORE**, press **Enter**.

## PORT UTILITY, SUBMENU OF UTIL

The **PORT UTILITY** submenu is used to access the display of the current software information for each port installed in the unit. This information is required when requesting assistance from ADTRAN Technical Support or when updates are needed.

## Operation

To display Figure 3-7 on the TSU 100, do the following:

1. Follow the standard operating procedure to access the **UTIL** menu items.
2. With the cursor on **PORT UTILITY**, press **Enter**. This displays the first available port.

```
5>PORT UTILITY
PORT:1.1 NX/DBU
```
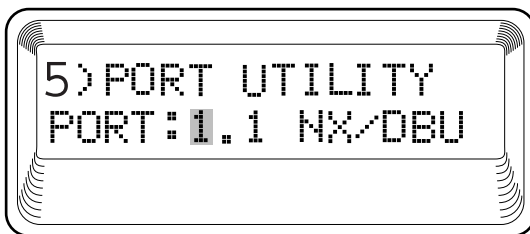
**Figure 3-7. Port Utility Submenu**

To display the port name and the software version installed as shown in Figure 3-8, do the following:

1. Use the scroll keys to move through the available ports, or enter the port number with the number key.

2. When the desired port name is displayed, press **Enter**.

3. Press **Cancel** to exit or to select another port.

```
NX/DBU FIRMWARE
VERSION
```
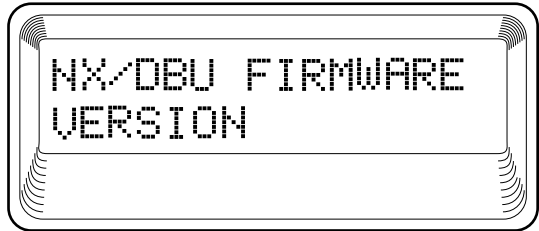
**Figure 3-8.  Port Name and Software Version Display**

## RUN SELF-TEST, SUBMENU OF TEST

This menu item is used to execute both the internal test of the TSU and of the Nx/DBU.  The results of the self-test are shown on the TSU display.  For additional information on self-test, see the Operation chapter of the appropriate TSU user manual.

To activate a self-test, do the following:

1. Follow the standard operating procedure to access the **TEST** menu items.

2. With the cursor on **RUN SELF TEST**, press **Enter**. The TSU display shows the test outcome.

## PORT TEST, SUBMENU OF TEST

This menu item is used to activate testing of specific data ports. It also controls the activation of loopbacks and the initiation of data test patterns. Test results are shown on the TSU display.

---

**CAUTION**   *Port Test execution disrupts normal data flow in the port being tested.*

---

## Operation

To display Figure 3-9 on the TSU 100, starting with the cursor on **PORT TEST**, press **Enter** or the number **3** key. This displays the available ports.

```
3)PORT TEST
PORT:1.1 NX/DBU
```
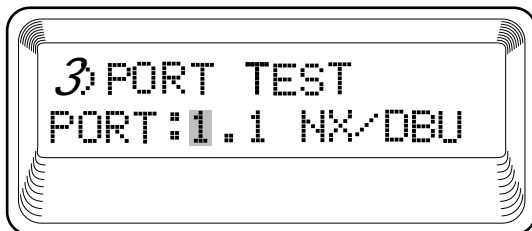
**Figure 3-9.  Port Test Submenu**

## 1.1 Nx/DBU Menu Options

The **1.1 Nx/DBU** interface offers the following seven test functions:

### PRT/LOCAL

The Nx port activates both a local loopback (back toward the DTE) and a port loopback when either is invoked. Choices: REMOTE, REM V.54 CONT, OFF

**REMOTE**

The remote loopback causes a channelized V.54 code to be sent to the far end. The Nx at the far end activates a **PORT/LCL** loopback on detection of the V.54 code.

**REM V.54 CONT**

This loopback causes a continuous V.54 code to be sent to the far end. The Nx at the far end activates a **PORT/LCL** loopback on detection of the V.54 code.

**OFF**

The loop is deactivated.

> **NOTE**
>
> *The TSU checks the remote loopback activation by detecting a proper response from the remote end. While waiting for the response, the display shows **Looping**. If successful, the display changes to **Looped Up**. If unsuccessful, it displays **Failed**.*

**511 PATT**

Activates the generation of the 511 test pattern toward the T1 network.
Choices: OFF, ON

**ON**

The pattern check circuitry is enabled and a test started. The test is ended by selecting **OFF**.

**OFF**

The pattern generation and check is disabled.

**511 RESULTS**

Displays the results of the 511 test indicated in menu se-lection 511 PATT.

The results are in the form of the number of errored sec-onds. The error count can be cleared by pressing the **Clear** key (**Shift + 9**). A bit error may be inserted into the data stream by pressing the **2** key.

**DBU LOOPBACK**

Activates the generation of the 511 test pattern toward the T1 network.
Choices: OFF, ON

**DBU TEST**

This selection is used to force a backup to occur even if a backup condition does not exist.
Choices: TESTS OFF, FORCED BACKUP, INTERFACE TST

**TESTS OFF**
Turns off DBU tests.

**FORCED BACKUP**
Used to force a backup regardless of time-of-day lock-outs or network conditions.

**INTERFACE TST**
This test causes the external DCE to dial its stored num-ber. After the connection is established the DBU will send a test pattern to verify the backup network. This test does not disrupt data or the primary network.

**DBU DATA/CNTRL**

Allows status of DCD and RI to be monitored while the INTERFACE TST is on. If the dial up network is correctly configured and dialed up, there should be an asterisk (*) over DCD.

**DBU TST RESULT**

When an interface test is active, the screen shown in Figure 3-10 will show the total number of DATA blocks received and the number of blocks with errors.
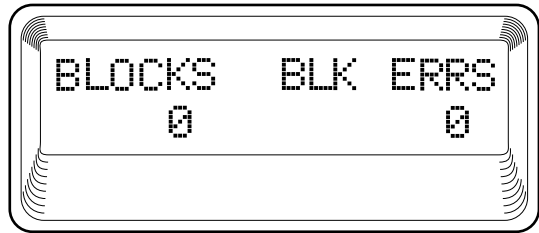


**Figure 3-10.  DBU TST Result Submenu**

# System Messages

## ALARM MESSAGES

### Network Interfaces

**Red Alarm**
NI unable to align frame with incoming signal

**Yellow Alarm**
Remote alarm indication (RAI) being received from the far end

**Blue Alarm**
Unframed all 1s (AIS) being received at NI

**Loss of Signal**
No signal detected at NI

### Nx/DBU Plug-on Board

**Clock Slip**
Difference in frequency of the data clock at the network and DTE

**PLL Alarm**
Unable to lock phase lock on the clock provided by the network interface

**Zeros Alarm**
All 0s data being sent to the network interface

**No EXT Clock**
No external transmit clock at DTE (when applicable)

## STATUS MESSAGES

## Network Interfaces

**Payload On**
Payload loopback activated

**Line On**
Line loopback activated

**Loopback Off**
All loopbacks deactivated

**Factory Restore**
Factory setting restored

**Power On**
Unit powered on

**Self-Test**
Internal self-test performed

# Nx/DBU Plug-on Board

### Loop-Up
Data is looped back at both the network interface and the DTE interface of the card

### Remote Loop Up
Sending a V.54 pattern in an attempt to loop up a remote device

### 511 Pattern On
Sending a 511 pattern towards the network interface

### Loop Down
Data is no longer looped back at the network interface or the DTE interface

### 511 Pattern Off
No longer sending a 511 pattern towards the network interface

# Index

# Product Support Information

## Pre-Sales Inquiries and Applications Support

Please contact your local distributor, ADTRAN Applications Engineering, or ADTRAN Sales:

Applications Engineering (800) 615-1176

Sales (800) 827-0807

## Post-Sale Support

Please contact your local distributor first. If your local distributor cannot help, please contact ADTRAN Technical Support and have the unit serial number available.

Technical Support (888) 4ADTRAN

## Repair and Return

If ADTRAN Technical Support determines that a repair is needed, Technical Support will coordinate with the Customer and Product Service (CaPS) department to issue an RMA number. For information regarding equipment currently in house or possible fees associated with repair, contact CaPS directly at the following number:

CaPS Department (256) 963-8722

Identify the RMA number clearly on the package (below address), and return to the following address:

ADTRAN, Inc.
CaPS Department
6767 Old Madison Pike
Progress Center
Building #6, Suite 690
Huntsville, AL 35807

RMA # _____