

## Total Access™ 750 Nx56/64 Data Service Unit Data Port TA 750 Nx56/64 DSU DP Installation and Maintenance

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## 1. GENERAL

This practice provides installation and maintenance procedures for the ADTRAN Total Access 750 Nx56/64 Data Service Unit Data Port. **Figure 1** is an illustration of the TA 750 Nx56/64 DSU DP.

### Revision History

This document has been revised to include Windows Hyperterminal information and update PASSWORD information.

### Features

The TA 750 Nx56/64, part number 1175025L1, features include the following:

- Provides bandwidth to single V.35 DTE port on TA 750 chassis backplane.
- Non-contiguous bandwidth assignment.
- Built-in DSU.

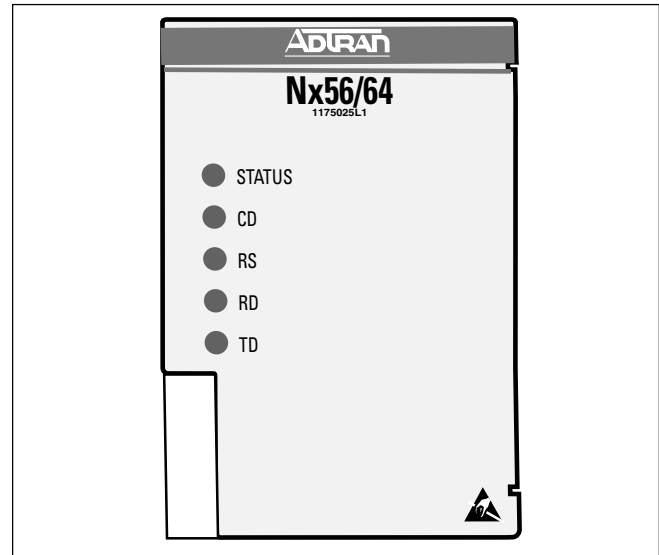


Figure 1. TA 750 Nx56/64 DSU DP

- Synchronous operation to 1.536 Mbps in increments of 56/64 kbps.
- 50% duty cycle output clock at all rates.
- User provisioned via craft interface on BCU.
- Hot swappable.
- FCC and UL 1950 compliant.
- Meets NEBS Level 3 requirements

### Description

The TA 750 Nx56/64 is a DSU data port that delivers T1 data over a V.35 interface. The unit is designed specifically for the TA 750 chassis where it inserts into slots 6 and 7; it is not used for any other application. The Nx56/64 can be craft provisioned to provide up to 24 channels in increments of N=56 or 64k, or 1 channel. The unit shares the chassis with five other access modules that occupy four channels each. Design operation is to assign excess or unused channels from the other units to the Nx56/64 for optimum use of the T1 line. Transmission data rates of the Nx56/64 range from 56 kbps to 1.536 Mbps using non-contiguous bandwidth assignment.

The Nx56/64 can be deployed in a point-to-point arrangement for local campus applications. **Figure 2** shows a typical configuration for Nx56/64 point-to-point deployment.

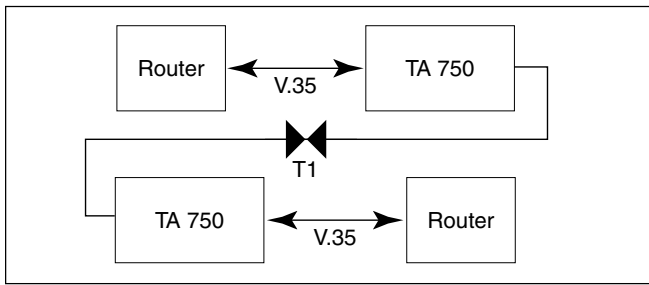


Figure 2. Point-to-Point Deployment

The TA 750 Power Supply Unit (PSU) and Bank Controller Unit (BCU) common modules provide both power and provisioning for the Nx56/64. Provisioning is screen menu driven via a DB-9 VT 100 interface on the BCU. All wiring connections are built into the TA 750 chassis backplane. External wiring connections are not required.

Signal transmission of the Nx56/64 is through the V.35 port on the TA 750 chassis backplane. For those installations equipped with an RS-449 connection, a V.35 to RS-449 adapter cable pinout is shown in **Table 1**.

Table 1. V.35 to RS-449 Pinout

V.35			RS-449		
Note	Name	Pin No	Pin No	Name	Note
	Frm Gnd	A	1	Frm Gnd	
	Sig Gnd	B	19 20 37	Sig Gnd Rx Com Tx Com	Pins 19, 20, and 37 connected.
Not Used	RTS	C	7	RTS	RTS looped to CTS.
	CTS	D	9	CTS	
	DSR	E	12	DTR	DTR looped to DSR.
	CD	F	13	DSR	
	DTR	H			
	Call Ind	J			
	TxD A	P	4	TxD A	
	RxD A	R	6	RxD A	
	TxD B	S	22	TxD B	
	RxD B	T	24	RxD B	
	Ext Tx C A	U	17	Ext Tx C A	
	Ext Rx C A	V	8	Ext Rx C A	
	Ext Tx C B	W	35	Ext Tx C B	
	Ext Rx C B	X	26	Ext Rx C B	
	TxC A	Y	5	TxC A	
	TxC B	AA	23	TxC B	
			25	RTS B	RTS B looped to CTS B.
			27	CTS B	
			30	DTR B	DTR B looped to DSR B.
			31	DSR B	

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by ADTRAN could void the user's authority to operate this equipment.

## 2. INSTALLATION



After unpacking the unit inspect it for damage. If damage is noted, file a claim with the carrier then contact ADTRAN Customer Service. See *Warranty and Customer Service*.

The TA 750 Nx56/64 can only insert into slots 6 and 7 of the TA 750 chassis. To install, hold the unit by the faceplate while supporting the bottom side. Align the card edges with the guide grooves and insert in the chassis until the edge connector seats firmly into the backplane. Lock the unit in place by pressing in on the locking lever.

### Telecommunications Codes

This product is intended for installation in Restricted Access Locations only and is intended to be installed in equipment with a Type "B" or "E" installation code. See **Table 2**.

Table 2. Telecommunications Codes

Code	Input	Output
PC	C	C
TC	-	X
TC	A	-

### Start-Up

The Nx56/64 is operational upon installation in an active TA 750 chassis. When inserted, front panel LEDs show an initialization sequence then provide unit operational status. During initialization the STATUS LED will turn On (red). After several seconds the other LEDs will scroll several times then all LEDs will remain steady showing current status of the Nx56/64.

## LED Status

The Nx56/64 faceplate has five LEDs to show status of the unit plus the condition of the transmit and receive data interfaces. In normal operation all LEDs are On (green). Refer to **Table 3** for LED descriptions.

## Timing

The Nx56/64 obtains single source timing from the BCU.

## Configuration

There are no hardware options on the Nx56/64 circuit board. All options are screen menu driven by the BCU. Listed here are the default options:

Channels	4
Data Rate	64 kbps
DSR	Normal
CTS	Normal
CD	Normal
DTE Tx Clk	Auto

Refer to **Table 4** for option descriptions.

Table 3. LED Indication

LED	Color	Description
STATUS	Off:	No Power
	Red:	Out of sync with DTE or bank in Alarm.
	Green:	Synchronized with DTE.
	Yellow:	Loopback active.
CD Carrier Detect	Off:	Indicates Nx56/64 status to Transmit or Receive data. Not ready to Transmit or Receive data.
	Green:	Ready to Transmit or Receive data.
RS Request to Send	Off:	Indicates DTE status to Transmit or Receive data. Not ready to Transmit or Receive data.
	Green:	Ready to Transmit or Receive data.
RD Receive Data	Off:	Indicates status of the Receive Data pin on the DTE interface. Data not being received from the T1 network.
	Green:	Data is being received from the T1 network.
TD Transmit Data	Off:	Indicates status of the Transmit Data pin on the DTE interface. Data not being received from the DTE.
	Green:	Data is being received from the DTE.

Note: LEDs scrolling indicate initialization in progress.

Table 4. Option Descriptions

Configuration	Description
# Of Channels .....	Selects the number of time slots (01 thru 24) for Nx56/64 kbps operation
RATE 56/64 .....	Selects the channel data rate of either 56 kbps or 64 kbps
56 .....	Selects 56 kbps
64 .....	Selects 64 kbps
DSR .....	Controls the state of the DSR lead from the Nx56/64
NORMAL .....	Causes DSR to follow DTR
FORCED ON .....	Causes DSR to be forced on and DTR ignored
CTS .....	Controls the state of the CTS lead from the Nx56/64
NORMAL .....	Causes CTS to follow RTS
FORCED ON .....	Causes CTS to be forced on and RTS ignored
CD .....	Controls the state of the CD lead from the Nx56/64
NORMAL .....	CD is active when loops are in sync and/or when a T1 carrier is present
FORCED ON .....	Causes CD to be forced on always
DTE TX CLK .....	Selects the timing source for the transmit data clock
Internal Invert .....	Inverted form of the internal DTE TX CLK setting
AUTO .....	Measures the delay between the DTE data and its clock and automatically selects between INTERNAL and INT-INV
INTERNAL .....	Allows the Nx56/64 to provide transmit data clock
EXTERNAL .....	Derives DTE transmit clock from the DTE device

## Electronic Provisioning

The craft interface on the TA 750 BCU is used to change default options and obtain access module status through menu screens. To access the menu screens, connect a VT 100 terminal or computer running a terminal emulation program to the faceplate craft interface ADMIN port using a standard male-to-female RS-232 DB9 cable. Craft port settings are as follows:

- 9600 Baud
- No parity
- 8 Data bits
- 1 Stop bit

## Windows Hyperterminal

Windows Hyperterminal can be used as a VT 100 terminal emulation program. Open Hyperterminal by selecting PROGRAMS/ACCESSORIES/HYPERTERMINAL. Refer to the Help section of Hyperterminal for additional information.

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### NOTE

**To ensure proper display background, select VT 100 terminal emulation under SETTINGS.**

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## Password

Upon initial connection, the password option is factory disabled. To enable the password, select Bank Controller (1)/Password Control (8)/ Enable Password (2). The factory default is PASSWORD in all capital letters. The password can be changed to a user selected password if desired.

## Menu Navigation

To traverse through the menus, select the desired entry and press ENTER. To work backwards in the menu press the ESC (escape) key. With the BCU provisioning interface connected the menu screens appear automatically. Screen renditions are presented on the following pages and are listed in the following sequence:

- Figure 3. Total Access 750
- Figure 4. Access Modules
- Figure 5. Nx56/64
- Figure 6. Nx56/64 Provisioning
- Figure 7. Time Slot Usage
- Figure 8. Nx56/64 Status
- Figure 9. Nx56/64 Test/No Test

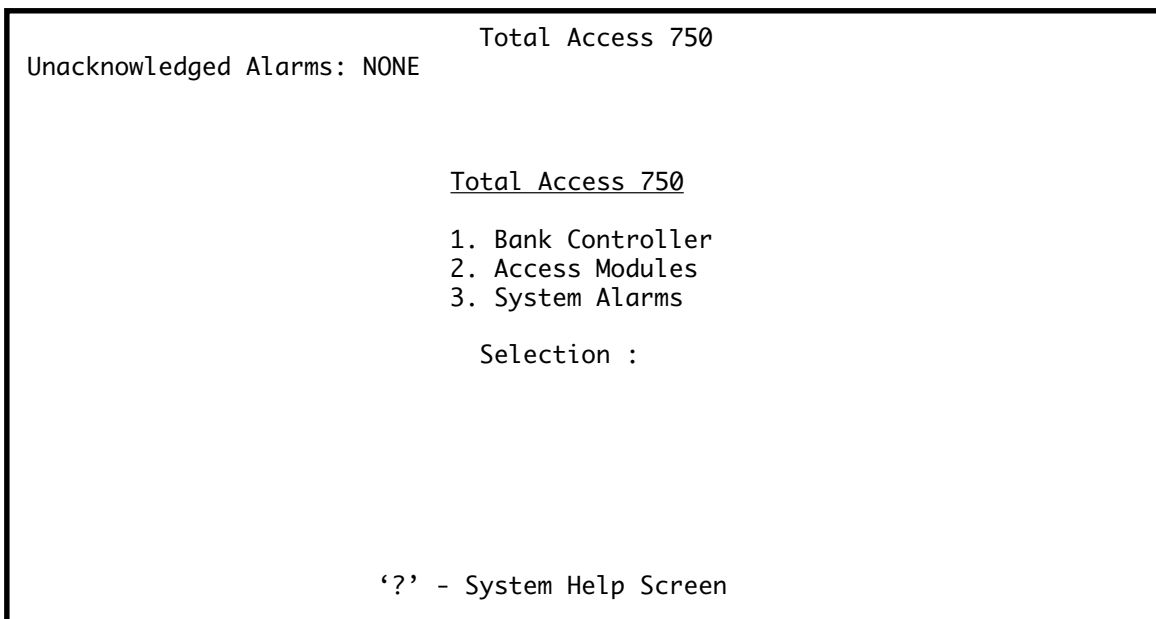


Figure 3. Total Access 750 Main Menu

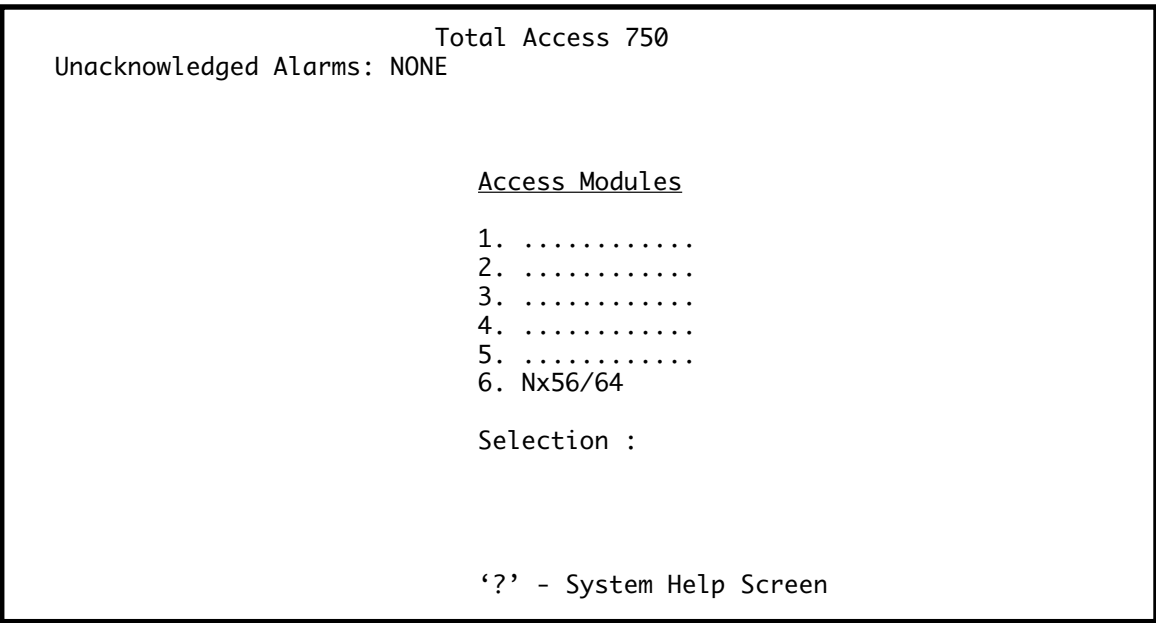


Figure 4. Access Modules Screen

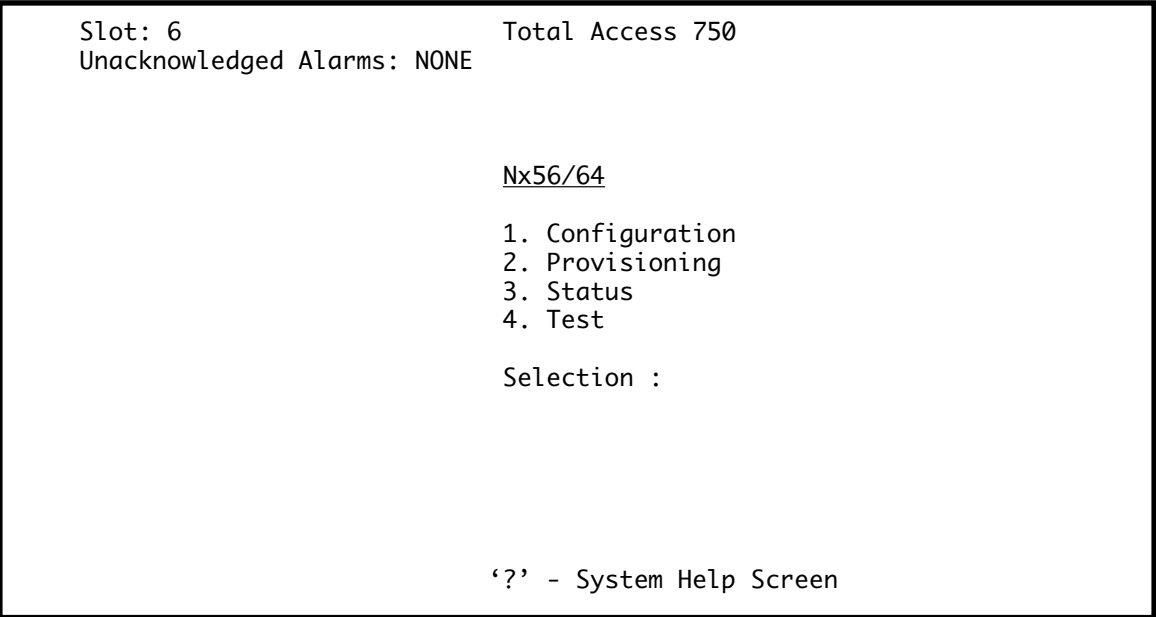


Figure 5. Nx56/64 Screen

```

Slot: 6                               Total Access 750
Unacknowledged Alarms: NONE

                                     Nx56/64 Provisioning

1. Number of Channels                 4
2. Nx56/64                           64K
3. DSR                               Normal
4. CTS                               Normal
5. CD                                 Normal
6. DTE Tx CLK                         Auto

Selection :

                                     '?' - System Help Screen

```

Figure 6. Nx56/64 Provisioning Screen

```

Slot: 6                               Total Access 750
Unacknowledged Alarms: NONE

Time Slot Usage
1      2      3      4      5      6      7      8
Open    Open    Open    Open    Open    Open    Open    Open

9      10     11     12     13     14     15     16
Open    Open    Open    Open    Open    Open    Open    Open

17     18     19     20     21     22     23     24
Open    Open    Open    Open    Nx56/64 Nx56/64 Nx56/64 Nx56/64
                               Slot: 6   Slot: 6   Slot: 6   Slot: 6

1. Add Time Slot
2. Remove Time Slot

Selection :

                                     '?' - System Help Screen

```

Figure 7. Time Slot Usage Screen

```
Slot: 6                               Total Access 750
Unacknowledged Alarms: NONE

                                     Nx56/64 Status

Data Rate                             64K
Channels Used                          4
Loopback                               No Test

                                     '?' - System Help Screen
```

Figure 8. Nx56/64 Status Screen

```
Slot: 6                               Total Access 750
Unacknowledged Alarms: NONE

                                     Nx56/64 Test: No Test

1. No Test
2. DTE Loopback
3. Network Loopback

Selection :

                                     '?' - System Help Screen
```

Figure 9. Nx56/64 Test/No Test Screen

## Channel Allocation

Channels may be assigned to the Nx56/64 unit non-contiguously. Channels assigned to other units (i.e., FXS) can not be assigned to the Nx56/64 unit.

Upon insertion, the Nx56/64 will automatically assign DS0s 21-24 to the V.35 port. If desired, these DS0s may be re-assigned to the Fractional T1 Port (DSX-1) when using the BCU List 2 (P/N 1175012L2).

To change the number of channels allocated to the Nx56/64, perform the following:

1. Select 1 in the Provisioning Options Menu, Screen 4.
2. Screen 5 shows the current channels in use by the Nx56/64. To add a time slot, enter 1 then the time slot to be added.
3. To remove a time slot, enter 2, then the time slot to be removed.

The screen will be updated as channels are added or removed. If other access modules are installed in the chassis, the time slots they use will be indicated on this screen. This alerts the user of time slots in use to prevent inadvertent assignment of an active time slot.

## Connection to DTE

The Nx56/64 connects to the DTE interface through the V.35 port on the TA 750 backplane. The V.35 pinout is shown in the V.35 column in Table 1.

## 3. OPERATION

After the Nx56/64 has been installed and provisioned to support network requirements, operation is transparent. Further provisioning or testing is through the BCU craft interface. Operational status is indicated by the Nx56/64 front panel LEDs which should all be On (green) during normal operation.

## 4. TESTING

Testing of the Nx56/64 is conducted through the BCU craft interface and screen menus. From the introductory menu, the Access Modules Menu can be selected. This menu lists what units are inserted in TA 750 chassis slots. To conduct tests of the Nx56/64, select slot 6 for entry into Nx56/64 menus.

### Loopback Testing

The Nx56/64 provides loopback tests to verify proper data path operation. The loopbacks are used in conjunction with bit error rate test (BERT) equipment. The loopbacks are used to troubleshoot and isolate system level problems.

#### *DTE LOOPBACK*

In this loopback the Nx56/64 transceivers are looped back to a point immediately before the T1 termination point, or toward the DTE interface. The loopback provides a complete diagnostic picture of the V.35 interface path.

#### *NETWORK LOOPBACK*

In this loopback the data is looped back to a point immediately before the DTE interface, or toward the T1 network interface. The loopback provides a complete diagnostic picture of the local Nx56/64 data path.



## 5. SPECIFICATIONS

Refer to **Table 5** for TA 750 Nx56/64 specifications.

Table 5. Specifications

Electrical		Signal Monitoring
Power Consumption:	2 Watts	RTS, DCD, TD, RD
Environmental		Data Rates
Operating Temperature:	0° to 50° C (32° to 113° F)	Any multiple of 56 kbps or 64 kbps up to 1.536 Mbps.
Storage Temperature:	-20° to 70° C (-4° to 158° F)	
Relative Humidity:	Up to 95% non-condensing	
Physical		Operating Mode
Dimensions:	1 15/16" W x 3" H x 10" L	Synchronous V.35
Weight:	3.5 Oz.	
Configuration Codes		
Power Code (PC):	IN: F, OUT: C	
Telecommunications Code (TC):	IN: -, OUT: -	
Installation Code (IC):	IN: A. OUT: -	

## 6. MAINTENANCE

The Nx56/64 does not require routine maintenance for normal operation.

ADTRAN does not recommend that repairs be attempted in the field. Repair services are obtained by returning the defective unit to ADTRAN Customer Service Department.

## 7. WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within 10 years from the date of shipment if it does not meet its published specifications or fails while in service (see: *ADTRAN Carrier Networks Equipment Warranty, Repair, and Return Policy and Procedure*, document: 60000087-10A).

Contact Customer And Product Service (CAPS) prior to returning equipment to ADTRAN.

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

### ADTRAN Sales

Pricing and Availability  
(800) 827-0807

### ADTRAN Technical Support

Presales Applications/Post-sale Technical Assistance  
888-4ADTRAN

Standard hours: Monday-Friday, 7 a.m.-7 p.m. CST  
Emergency hours: 7 days/week, 24 hours/day

### ADTRAN Repair/CAPS

Return for repair/upgrade  
(256) 963-8722

### Repair and Return Address

ADTRAN, Inc.  
CAPS  
901 Explorer Boulevard  
Huntsville, Alabama 35806-2807