Total Access™ Nx56/64 Data Service Unit Data Port Installation and Maintenance

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1. GENERAL

This practice provides installation and maintenance procedures for the ADTRAN Total Access 850 Nx56/64 Data Service Unit Data Port. **Figure 1** shows the TA 850 Nx56/64 DSU DP.

Revision History

This is the initial release of this document. Future revisions to this document will be described in this subsection.

Features

The TA 850 Nx56/64, part number 1200372L1, features include the following:

- Provides bandwidth to single V.35 DTE port on TA 850 chassis backplane.
- Non-contiguous bandwidth assignment.
- Built-in DSU.
- 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, NEBS Level 3, and UL 1950 compliant.

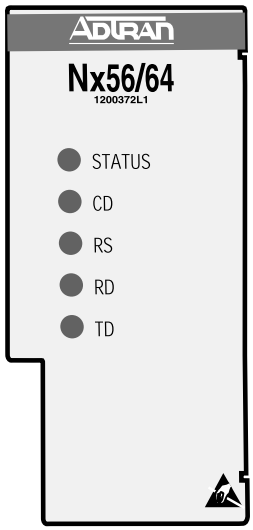

Figure 1. TA 850 Nx56/64 DSU DP

Description

The TA 850 Nx56/64 is a DSU data port that delivers T1 data over a V.35 interface. The unit is designed specifically for the TA 850 chassis where it inserts into slots A and B. 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 six other access modules. 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 on page 2** shows a typical configuration for Nx56/64 point-to-point deployment. **Figure 3 on page 2** shows a general deployment arrangement.

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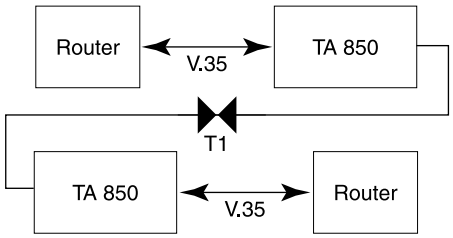

Figure 2. Point-to-Point Deployment

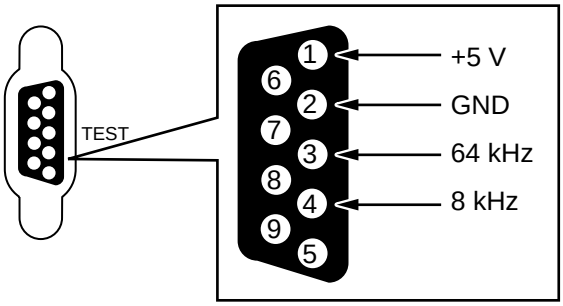

Figure 3. General Deployment

The TA 850 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 850 chassis backplane. External wiring connections are not required. Signal transmission of the Nx56/64 is through the V.35 port on the TA 850 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	Sig Gnd	Pins 19, 20, and 37 connected
			20	Rx Com	
			37	Tx Com	
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 TxC A	U	17	Ext TxC A	
	Ext RxC A	V	8	Ext RxC A	
	Ext TxC B	W	35	Ext TxC B	
	Ext RxC B	X	26	Ext RxC 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	

2. INSTALLATION

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

The TA 850 Nx56/64 can only insert into slots A and B of the TA 850 chassis. To install, hold the unit by the faceplate while supporting the bottom. 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.

CAUTION

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.

Start-Up

The Nx56/64 is operational upon installation in an active TA 850 chassis. When inserted, front panel LEDs show an initialization sequence and 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 2 on page 4** 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. The default options are as follows:

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

Refer to **Table 3 on page 4** for option descriptions.

Electronic Provisioning

The craft interface on the TA 850 BCU is used to change default options and obtain access module status through menu screens. To access the menu screens, connect either a VT 100 terminal or a computer running a terminal emulation program to the faceplate craft interface ADMIN port using a standard male-to-male RS-232 DB-9 cable. Craft port settings are as follows:

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

Table 2. 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		Indicates Nx56/64 status to Transmit or Receive data.
Carrier Detect	Off:	Not ready to Transmit or Receive data.
	Green:	Ready to Transmit or Receive data.
RS		Indicates DTE status to Transmit or Receive data.
Request to Send	Off:	Not ready to Transmit or Receive data.
	Green:	Ready to Transmit or Receive data.
RD		Indicates status of the Receive Data pin on the DTE interface.
Receive Data	Off:	Data not being received from the T1 network.
	Green:	Data is being received from the T1 network.
TD		Indicates status of theTransmit Data pin on the DTE interface.
Transmit Data	Off:	Data not being received from the DTE.
	Green:	Data is being received from the DTE.
Note: LEDs scrolling indicate initialization in progress.		

Table 3. 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 an E1 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

Password

When connected, enter the password. The factory default is PASSWORD in all capital letters. The password can be changed to a user selected password once connected.

Menu Navigation

To navigate through the menus, select the desired entry and press **Enter**. To work backwards in a menu, press the **Esc** (escape) key. With the BCU provisioning interface connected, the menu screens appear automatically. Screens are presented in the following sequence:

- Total Access 850 Screen (**Figure 4 on page 7**)
- Access Modules Screen (**Figure 5 on page 7**)
- Nx56/64 Screen (**Figure 6 on page 7**)
- Nx56/64 Provisioning Screen (**Figure 7 on page 7**)
- Time Slot Usage Screen (**Figure 8 on page 8**)
- Nx56/64 Status Screen (**Figure 9 on page 8**)
- Nx56/64 Test/No Test Screen (**Figure 10 on page 8**)

Channel Allocation

Channels may be assigned to the Nx56/64 unit non-contiguously. Channels assigned to other units (e.g., FXS) cannot be assigned to the Nx56/64 unit. Upon insertion, the Nx56/64 will automatically assign DSOs 21-24 to the V.35 port. If desired, these DSOs may be reassigned to the Fractional T1 Port (DSX-1) when using the BCU List 2 (P/N 1200373L2). To change the number of channels allocated to the Nx56/64, perform the following steps:

1. Select 1 in the Provisioning Options Menu (**Figure 7 on page 7**).
2. The Time Slot Usage screen **(Figure 8 on page 8**) shows the channels in use by the Nx56/64. To add a time slot, enter 1 and then the time slot to be added.
3. To remove a time slot, enter 2 and 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 850 backplane. The V.35 pinout is shown in the V.35 column in **Table 1 on page 2**.

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 the units inserted in TA 850 chassis slots. To conduct tests of the Nx56/64, select slot A 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 4 on page 8** for TA 850 Nx56/64 specifications.

6. MAINTENANCE

The Nx56/64 does not require programmed maintenance for design operation.

ADTRAN does not recommend that repairs be attempted in the field. For repair services, return 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. For detailed warranty, repair, and return information refer to 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, see the following sections for the correct toll-free contact number.

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.
6767 Old Madison Pike
Progress Center
Building #6 Suite 690
Huntsville, Alabama 35807

RMA # _____

8. LIMITED PRODUCT WARRANTY

ADTRAN warrants that for ten 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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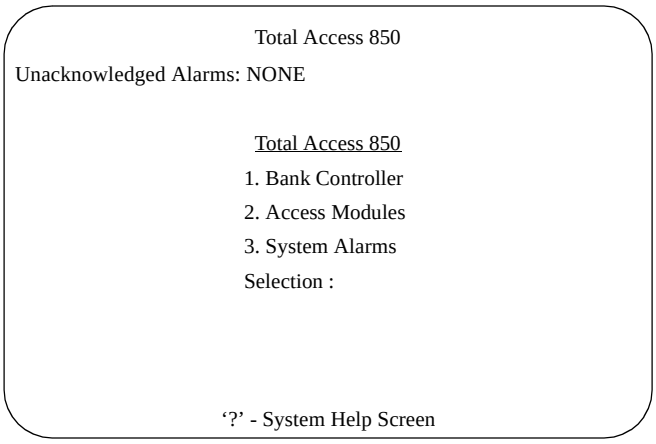

Figure 4. Total Access 850 Screen

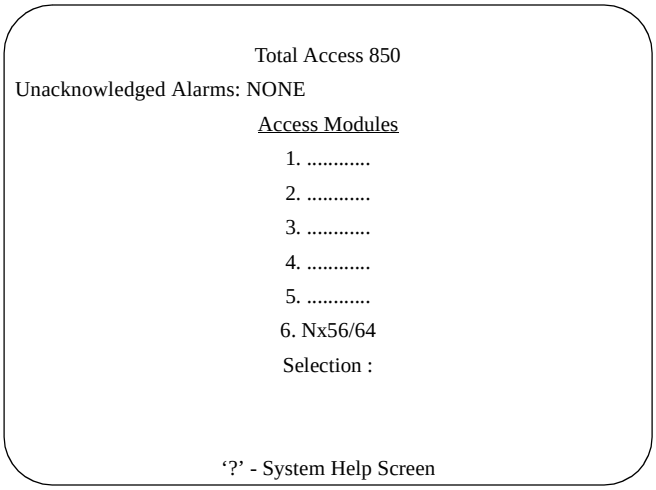

Figure 5. Access Modules Screen

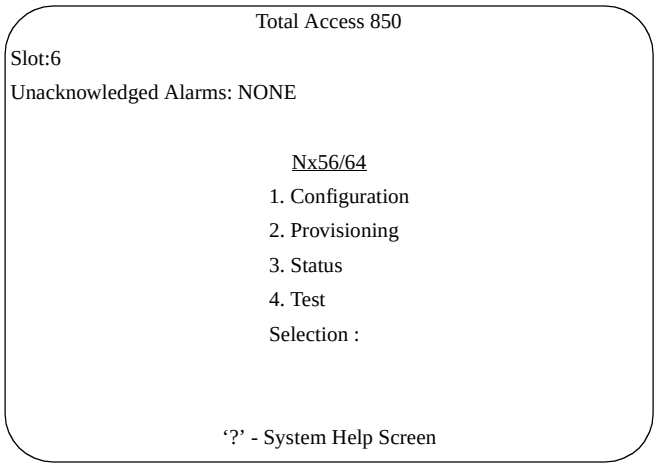

Figure 6. Nx56/64 Screen

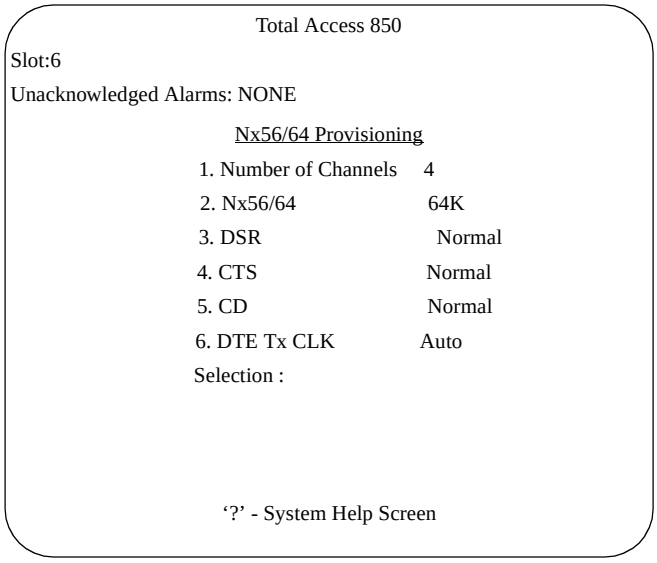

Figure 7. Nx56/64 Provisioning Screen

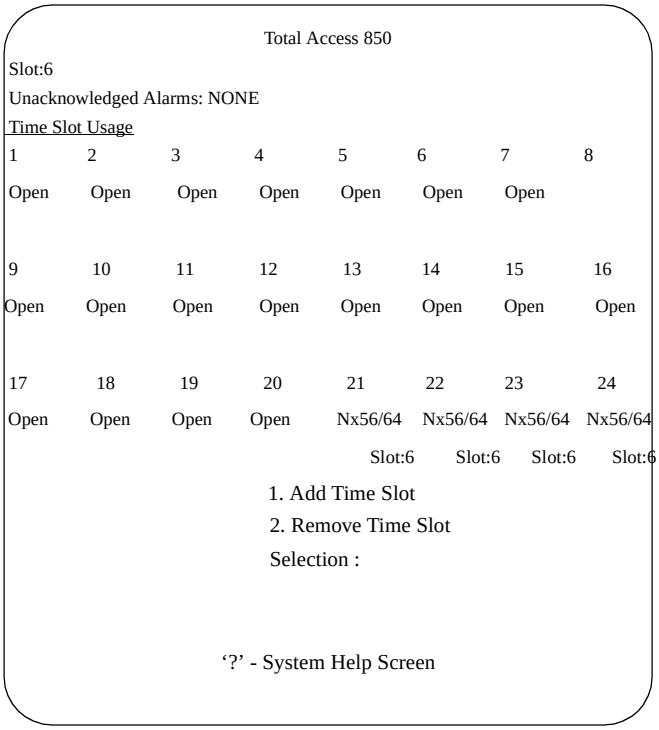

Figure 8. Time Slot Usage Screen

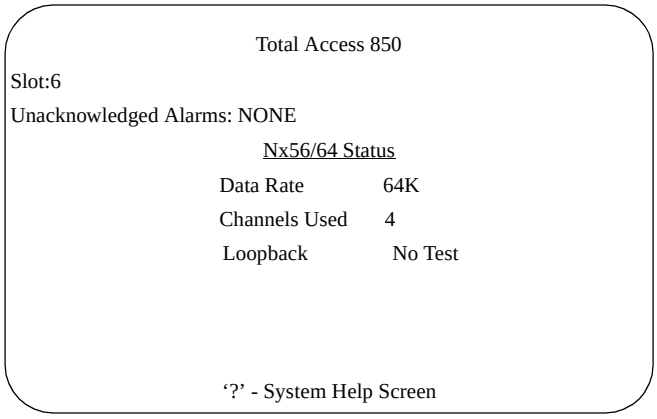

Figure 9. Nx56/64 Status Screen

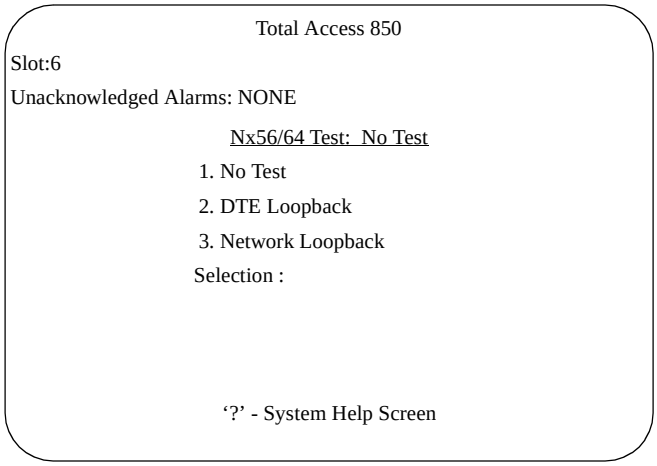

Figure 10. Nx56/64 Test/No Test Screen

Table 4. Specifications

Electrical		**Signal Monitoring**
Power Consumption:	2 Watts	RTS, DCD, TD, RD
Environmental		**Data Rates**
Operating Temperature:	0 to 50 ^{o}C (32 to 113 ^{o}F)	Any multiple of 56 or 64 kbps up to 1.536 Mbps.
Storage Temperature:	-20 to 70 ^{o}C (-4 to 158 ^{o}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: -