



# Quad Nx 56/64 Module

Part Number 1200184L1

**USER MANUAL**



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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.*

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



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# Chapter 1

## Introduction

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### QUAD Nx 56/64 MODULE OVERVIEW

The Quad Nx (pronounced “N-by”) 56/64 Module provides four synchronous V.35 DTE ports, each of which can operate at any rate that is a multiple of 56 or 64 kbps, up to 1.536 Mbps. The Quad Nx 56/64 Module can be installed in any option slot of the ATLAS chassis.

### Features

- Each port operates using 1 to 24 DS0s
- Includes an elastic store for absorption of rate variations
- Any port can be used as a timing source for the entire system
- Outputs a 50 percent duty-cycle output clock at all rates
- Generates and responds to V.54 looping codes
- Generates and checks 511 test patterns
- Bidirectional loopbacks:
  - Port (toward the network)
  - DTE (toward the DTE)



**NOTE** *Loopbacks can be invoked locally or remotely (V.54).*

### Interfaces

- CCITT V.35 electrical (differential)
- Connector: DB-37 (DB-37 to Dual Winchester V.35 connector adapter cables are shipped with this module)

## Module Specifications

### DTE Interface

CCITT V.35 Synchronous

### Rates

56 kbps to 1.536 Mbps in 56K or 64K steps

### Tests

Local Loopback (Bilateral)

Remote Loopback (V.54)

Self Test

### Test Pattern

511 with errored seconds display and error inject capability

### 1s Density Protection

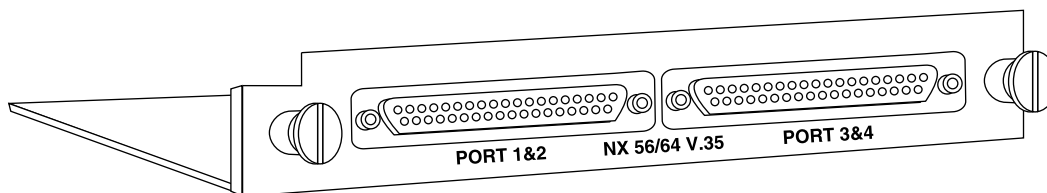
### Connector

DB-37 with cables to convert to Winchester female connectors

## Physical Description

The Quad Nx 56/64 Module can plug into any available option slot in the ATLAS 800 chassis (see Figure 1-1).

The module has an indication under each D-shell connector referring to the port on the card.



**Figure 1-1**  
*Quad Nx 56/64 Module*

## Adapter Cable

Two ADTRAN-supplied adapter cables convert from the DB-37 connectors on the rear of the module to Dual Winchester V.35 connectors. These connectors are marked as 1/3 and 2/4 to represent the port connected (1 or 3/2 or 4), based on which DB-37 the cable is attached to.



# Chapter 2

## Installation

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### UNPACK AND INSPECT

Carefully inspect the option module for any shipping damage. If damage is suspected, file a claim immediately with the carrier and then contact ADTRAN Technical Support. (See the last page of this manual for information on contacting Technical Support.) If possible, keep the original shipping container for use in shipping the option module back for repair or for verification of damage during shipment.

### ADTRAN Shipments Include

- The Quad Nx 56/64 Module
- The *Quad Nx 56/64 Module User Manual* (to be inserted into the appropriate section of the *ATLAS 800 User Manual*)
- Two DB-37 to dual V.35 Winchester adapter cables

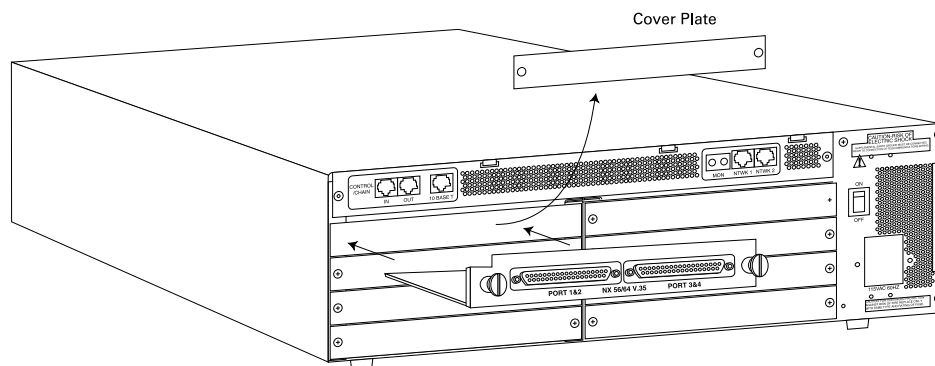
### Customer Provides

- DTE cables

## INSTALLING THE QUAD NX 56/64 MODULE

Figure 2-1 is representative of the action required for proper placement of the Quad Nx 56/64 Module. Perform the following steps to install the option module:

1. Remove the cover plate (corresponding to the slot in which the Quad Nx 56/64 Module will be installed) from the ATLAS 800 chassis rear panel.
2. Slide the Quad Nx 56/64 Module into the ATLAS 800 chassis until the module is positioned firmly against the front of the ATLAS unit.
3. Fasten the thumbscrews at both edges of the option module.
4. Connect the cables to the associated device (s).
5. Complete installation of remaining modules and Base Unit as specified in the *Installation* chapter of the *ATLAS 800 User Manual*.



**Figure 2-1**  
*Installing the Quad Nx 56/64 Module*

## WIRING

Each port of the Quad Nx 56/64 Module has a V.35 Winchester-style connection (via the supplied adapter cables) as defined in Table 2-A.

**Table 2-A**  
*V.35 Winchester 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
H	-	Data terminal ready (DTR) from DTE*
J	-	Ring indicator (RI)*
L	-	Local loopback (LL) from DTE*
N	-	Remote loopback (RL) from DTE*
R	104	Received data (RD-A) to DTE
T	104	Received data (RD-B) to DTE
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-A) to DTE
AA	114	TX clock (TC-B) to DTE
U	113	External TX clock (ETC-A) from DTE
W	113	External TX clock (ETC-B) from DTE
NN	-	Test mode (TM) to DTE

\* Ignored by Quad Nx 56/64 Module

## POWER-UP TESTING AND INITIALIZATION

The Quad Nx 56/64 Module executes a self test during the power-up sequence, as described in the *ATLAS 800 User Manual*. Upon power-up, any previously configured setting for the Quad Nx 56/64 Module is automatically restored.

When the self test is completed and the 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.

If the power-up self test is not successful, refer to the *Troubleshooting* section of the *ATLAS 800 User Manual* to diagnose and correct the problem.

Return to Chapter 2 (Installation) of the *ATLAS 800 User Manual* to continue system set-up.



# Chapter 3

## Operation

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### OVERVIEW

The Quad Nx 56/64 Module can be configured and controlled from a variety of sources, including:

- The ATLAS 800 Front Panel, providing minimal configuration and status support
- The terminal menus, allowing detailed configuration, status, and diagnostics
- SNMP, used primarily for reporting alarm conditions and system status

The terminal menu is accessed using either a VT 100 Terminal attached to the ATLAS 800 Base Unit's control port, or through a Telnet session, established through the Base Unit's Ethernet port. Detailed instructions on the operation of each of the supported management approaches are presented in the *ATLAS 800 User Manual*.



*In order to edit items in the terminal menus, you must have the appropriate password level. Each menu description in this section indicates the required password level required for write and read access. See the section Access Passwords in the ATLAS 800 User Manual for detailed information on working with passwords. Security level 1 users can view and edit every available field. Security level 5 users can view any field but cannot edit.*

The remainder of this section describes the menu items presented when managing the Quad Nx 56/64 Module via the terminal menus.

### TERMINAL MENU STRUCTURE

The ATLAS 800 uses a form of hierarchical menus to access all features. The topmost menu level leads to submenus which are grouped by functionality. All menu items display in the terminal window.



*Refer to the ATLAS 800 User Manual for detailed instructions on how to navigate through the terminal menu.*

The ATLAS 800 System Controller automatically detects the presence of the Quad Nx 56/64 Module when it is installed in the system. To see the menus for the Quad Nx 56/64 Module via the terminal menu, use the arrow keys to scroll to the Modules menu and press Enter to access the module choices. Figure 3-1 shows the Modules menu. The following sections describe all the menu options.

Slot	Type	Menu	Alarm	Test	State	Status	Rev
0	Sys Ctrl	[+]	[OK]	[OFF]	ONLINE	OnLine	
1	V35Nx-4	[+]	[n/a]	[n/a]	ONLINE	No Response	
2	T1/PRI-4	[+]	[n/a]	[n/a]	ONLINE	No Response	
3	UBRI-8	[+]	[n/a]	[n/a]	ONLINE	No Response	
4	V35Nx-4	[+]	[n/a]	[n/a]	ONLINE	No Response	
5	V35Nx-4	[+]	[n/a]	[n/a]	ONLINE	No Response	
6	T1/PRI-4	[+]	[n/a]	[n/a]	ONLINE	No Response	
7	UBRI-8	[+]	[n/a]	[n/a]	ONLINE	No Response	
8	T1/PRI-4	[+]	[n/a]	[n/a]	ONLINE	No Response	

**Figure 3-1**  
Modules Menu

## Menu Description

### Slot

Read security: 5

Displays the number of all the available slots in the ATLAS 800 chassis. Slot 0 refers to the ATLAS 800 base unit. This field is read-only.

### Type

Write security: 3; Read security: 5

Displays the type of module actually installed in the slot or the type of module you plan to install in the slot. If a Quad Nx 56/64 Module is installed, the Type field will automatically default to V35Nx-4 (the Quad Nx 56/64 Module). You can use this field to pre-configure a system before actually installing modules by simply specifying the module that you want to install in each slot.



**NOTE** *If you install a module in a slot, then want to install a different type of module in the slot, you must set this field to Empty before selecting another module type.*



**NOTE** *If a module is installed, the module type will automatically display the name of the installed module, and cannot be set to any other option.*

**Menu**

Selecting this item displays additional status and configuration menus about the selected module. (To access the submenus for this item, use the arrow keys to scroll to the Menu column for the module you want to edit, and press Enter.) For detailed information on each submenu item, see the section *Quad Nx 56/64 Module Menu Options* on page 10.

**Alarms**

Read security: 5

This field displays whether there is an alarm condition on the Quad Nx 56/64 Module. Press Enter in this field to activate the Alarm menu.

**Test**

Read security: 5

This field displays whether the Quad Nx 56/64 Module is executing a test. Press Enter in this field to activate the Test menu.

**State**

Write security: 3; Read security: 5

Even though a module is physically installed, it must be marked Online for it to be considered an available resource. This parameter allows an installed module to be marked Offline, which may be useful in system troubleshooting.

**Status**

Read security: 5

This is a read-only field presenting status information on the Quad Nx 56/64 Module. The following messages may display:

Online:	The module is enabled, and is responding to the System Controller's status polls. This is the normal response of the system.
No Response:	The module is enabled, but is not responding to the System Controller's status polls. This response indicates either a problem in the system or that the module is not installed.
Empty:	The System Controller has not detected the presence of a module in the slot, nor has a module been manually enabled for this option slot.
Offline	The module is installed, but has been taken Offline by a user. The module is still responding to controller polls.
Offline/ No Response:	The module is installed, but has been taken Offline by a user. The module is not responding to polls.

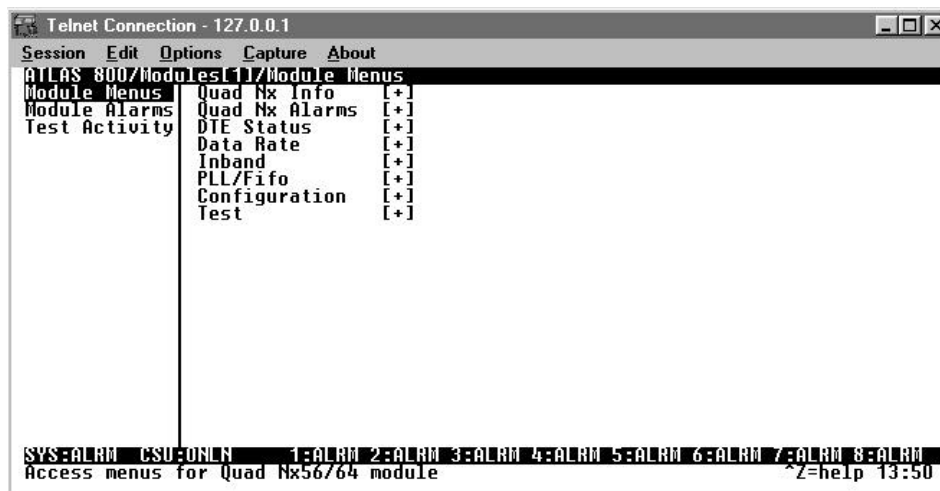
**Hardware Revision**

Read security: 5

This is a read-only field that displays the hardware revision of the Quad Nx 56/64 Module.

## Quad Nx 56/64 Module Menu Options

Figure 3-2 shows the menu options available for the Quad Nx 56/64 Module. The following sections describe these options.



**Figure 3-2**

*Quad Nx 56/64 Module Menu Options*

### Quad Nx Info

Read security: 5

The Quad Nx 56/64 Info submenu indicates the status of the module.

#### Part Number

Displays the part number of the module. This field is read-only.

#### Serial Number

Displays the Quad Nx 56/64 Module's serial number. This field is read-only.

### Quad Nx Alarms

Read security: 5

This option displays any active alarms. These fields are read-only.

#### SLIP

A rate mismatch exists between the DTE clock and the network-side clock (as set by DS0 assignment).

#### PLL

The Nx port is not able to lock onto the clock provided by the network interface.

#### ZERO

The DTE is sending an excessive number of consecutive zeroes to the network interface.



**NO EXT CLK**

The DTE is not providing an external transmit clock (only if the V.35 Nx port is configured to get transmit clock from the DTE.)

**DTE Status**

Read security: 5

Shows the status of key DTE interface signals. The following signals are monitored (these options are read-only):

**RTS**

Request To Send from DTE

**CTS**

Clear To Send to DTE

**DTR**

Data Terminal Ready from DTE

**DSR**

Data Set Ready to DTE

**DCD**

Data Carrier Detect to DTE

**RI**

Ring Indicate to DTE

**TD**

Transmit Data from the DTE

**RD**

Receive Data toward the DTE

**Data Rate**

Read security: 5

Displays the data rate at which each Nx port is currently operating. A port's data rate is determined by the number of DS0s assigned to it and the rate per DS0 associated with the active maps.

**Inband**

Read security: 5

**ID**

Correct Unit ID

**PASS**

Correct Password

**CRC**

Correct CRC

**TX**  
Active Transmit

**RX**  
Active Receive Data

### PLL/Fifo

Read security: 5

**Lock**  
Phase Lock Loop is locked

**RXE**  
Receive data FIFO Empty

**RXF**  
Receive Data FIFO Full

**TXE**  
Transmit Data FIFO Empty

**TXF**  
Transmit Data FIFO Full

### Configuration

The CONFIG submenu configures the Quad Nx 56/64 Module.

**Name**  
Write security: 3; Read security: 5  
Allows you to enter a descriptive alpha-numeric name for each port.

**Clk (+/-) (TX Clock Polarity)**  
Write security: 3; Read security: 5  
Controls the clock used by the Quad Nx 56/64 Module to accept the transmit (TX) data from the DTE. This is usually set to Normal. If the interface cable is long, causing a phase shift in the data, the clock can be set to Inverted. This switches the phase of the clock, which should compensate for a long cable.

**Clk Srce (Clock Source)**  
Write security: 3; Read security: 5  
Selects the source for the DTE transmit clock, either Internal or DTE.

**Data (Data Format)**  
Write security: 3; Read security: 5  
Used to control the inverting of the DTE data. This inversion can be useful when operating with a high-level data link control (HDLC) protocol (often used as a means to ensure 1s density). Select either Normal or Inverted.

**CTS**

Write security: 3; Read security: 5

Clear to Send. Used to control characteristics of CTS (see Table 3-A). Choose from Normal or Forced On.

**DCD**

Write security: 3; Read security: 5

Data Carrier Detect. Indicates to the DTE when a valid signal is being received at the Network Interface (see Table 3-A). Choose from Normal or Forced On.

**DSR**

Write security: 3; Read security: 5

Data Set Ready. This signal indicates to the DTE when the DCE is turned *On* and ready for operation (see Table 3-A). Choose from Normal or Forced On.

**DTR**

Write security: 3; Read security: 5

Data Terminal Ready. This parameter determines whether the ATLAS 800 treats a connection as permanent (DTR=Ignore) or to connect only when DTR is active (DTR=Connect On DTR). Select either Ignore or Connect on DTR.

**O Inh (Zero Inhibit)**

Write security: 3; Read security: 5

When the port detects an uninterrupted string of 0s being transmitted for more than one second, setting this parameter to ON will cause the ATLAS 800 to send 1s toward the network.

**Table 3-A**  
*Normal Mode Operation*  
*(conditions which cause the port control signal to be deactivated)*

SIGNAL	RTS	V.54 LOOPBACK	511 TEST ON	SELF TEST ACTIVE	NETWORK TEST ACTIVE	NO DSO MAPPED	NETWORK ALARM
CTS	Follows	Off	Off	Off	Off	Off	Off
DCD	—	—	—	Off	Off	Off	Off
DSR	—	Off	Off	Off	Off	Off	—
— = Do not care							
Force On = On under all conditions							

**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 displayed on the ATLAS 800 front panel.



*The execution of Port Tests disrupts normal data flow in the port being tested.*

**Loopbk**

Write security: 4; Read security: 5

Controls the activation and deactivation of loopbacks.

No Loopback	The loop is deactivated.
Local Loopback	The Nx port activates both a local loopback (back toward the DTE) and a port loopback when invoked.
Remote Loopback	The remote loopback causes a V.54 loopback code to be sent to the far end. If the device at the far end supports V.54, the device activates a loopback on detection of the V.54 code.

**Loopback Status**

Read security: 5

This read-only option indicates a port's current loopback status by displaying any of the following status messages:

- No loopback active
- Looping up remote unit
- Remote unit looped back
- Looping down remote unit
- Remote loopup failed
- Port looped from remote source
- Port loopback active

**511 (511 Test Pattern)**

Write security: 4; Read security: 5

Controls the activation of the 511 test pattern generator and detector.

Off      Turns off the 511 test pattern generator and detector.

On       Turns on the 511 test pattern generator and detector.

**511 Result**

Read security: 5

Displays the results of the 511 test. This option is read-only. The results are in the form of the number of errored seconds.

Sync     Y (yes), N (no)

ES       Errored seconds. Indicates the number of seconds (after pattern sync) that have contained at least one error.

**Inject (Inject Error)**

Write security: 4; Read security: 5  
Injects a 511 pattern error.

**511 Clr (Clear Results)**

Write security: 4; Read security: 5  
Clears test results for the selected port.



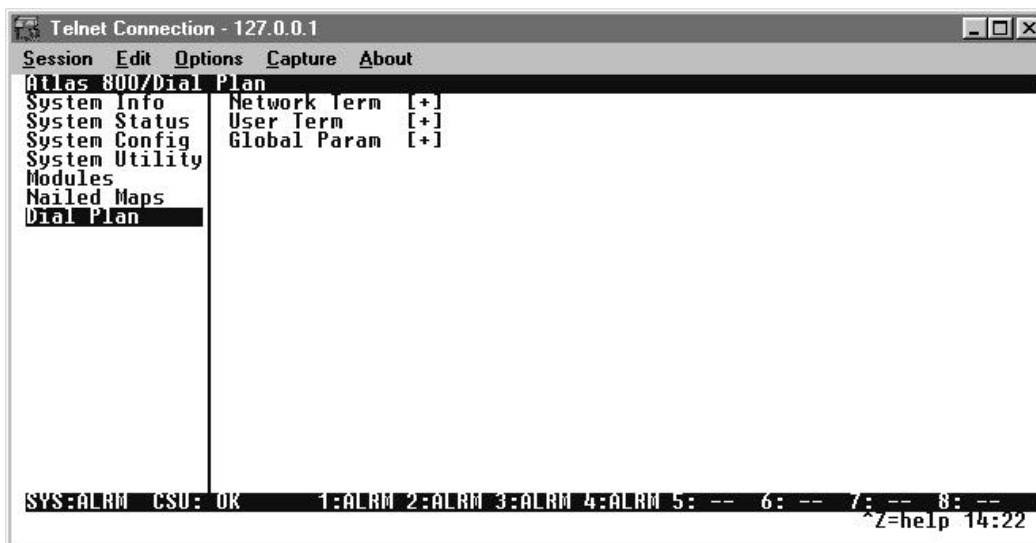
# Appendix A

## Quad Nx 56/64 Dial Plan Interface Configuration

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### INTERFACE CONFIGURATION

The Interface Configuration option for the Dial Plan menu sets configuration parameters for the end point. These parameters will vary by the type of port selected. The following section describes the configuration options available for the Quad Nx 56/64 Module. The Dial Plan menus are only accessible when using terminal mode. To access these options, select Dial Plan from the top level menu.



**Figure A-1**  
*Dial Plan Menus*

## Nx56/64 Option Module Interface Configuration

This section describes the User Termination configuration settings for the Quad Nx56/64 Module when using the Dial Plan menus.



*The Nx56/64 can only serve as a User termination end point.*

### Nx56/64 Option Module (User Termination)

When you are working in the User Termination section of the Dial Plan menu, the Slot is defined as a Nx56/64 module, the following configuration options are available:

#### Ports Available

Indicates which of the four ports of the Quad Nx56/64 module have already been defined either in another switched end point (indicated by “s”) or in a Dedicated Map (indicated by “n”). This field is read-only.

#### Number of Ports

Defines to ATLAS how many of the ports could be used to answer calls to the number(s) defined in the Accept Call list. You can enter numbers 1 through 4. The ports are contiguous beginning with the Port number select and the number of ports.

Example: If the port selected (as a part of Slot/Port selection) is 2, and the number of ports selected here was 2, then ports 2 and 3 would be enabled to receive calls to the numbers listed under the Incoming Call Accept list.



---

## Numerics

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## Product Support Information

### Presales 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 ADTRAN account representative first. If your ADTRAN account representative cannot help, please contact ADTRAN Technical Support and have the unit serial number available.

Technical Support	(888) 4ADTRAN
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### Repair and Return

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

RMA Department	(205) 963-8722
----------------	----------------

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

ADTRAN, Inc.  
RMA Department  
901 Explorer Boulevard  
Huntsville, Alabama 35806

RMA # \_\_\_\_\_