



# **Quad T1/PRI Module User Manual**

**Part Number 1200185L3**



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**FCC regulations require that the following information be provided in this manual to the customer:**

1. This equipment complies with Part 68 of the FCC rules. The required label is affixed to the bottom of the chassis.
2. An FCC-compliant telephone cord and modular plug is provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68-compliant. See Chapter 2, Installation, for details.
3. If your telephone equipment (Quad T1/PRI Module) causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.
4. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice to give you an opportunity to maintain uninterrupted service.
5. If you experience trouble with this equipment (Quad T1/PRI Module), please contact ADTRAN at (256) 963-8000 for repair/warranty information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected or until you are sure the equipment is not malfunctioning.
6. This unit contains no user-serviceable parts.
7. The following information may be required when applying to your local telephone company for leased line facilities.

Service Type	REN/SOC	FIC	USOC
1.544 Mbps - SF	6.0N	04DU9-BN	RJ-48C
1.544 Mbps - SF and B8ZS	6.0N	04DU9-DN	RJ-48C
1.544 Mbps - ESF	6.0N	04DU9-1KN	RJ-48C
1.544 Mbps - ESF and B8ZS	6.0N	04DU9-1SN	RJ-48C
ISDN	6.0N	04DU9-ISN	RJ-48C

**Federal Communications Commission (FCC) 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.

<b>WARNING</b>	<i>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.</i>
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**Affidavit Requirements for Connection to Digital Services**

- An affidavit is required to be given to the telephone company whenever digital terminal equipment without encoded analog content and billing protection is used to transmit digital signals containing encoded analog content which are intended for eventual conversion into voiceband analog signals and transmitted on the network.
- The affidavit shall affirm that either no encoded analog content or billing information is being transmitted or that the output of the device meets Part 68 encoded analog content or billing protection specifications.
- End user/customer will be responsible for filing an affidavit with the local exchange carrier when connecting unprotected customer premise equipment (CPE) to 1.544 Mbps or subrate digital services.
- Until such time as subrate digital terminal equipment is registered for voice applications, the affidavit requirement for subrate services is waived.

**Affidavit for Connection of Customer Premises Equipment to 1.544 Mbps and/or Subrate Digital Services**

For the work to be performed in the certified territory of \_\_\_\_\_ (telco name)

State of \_\_\_\_\_

County of \_\_\_\_\_

I, \_\_\_\_\_ (name), \_\_\_\_\_ (business address),  
\_\_\_\_\_ (telephone number) being duly sworn, state:

I have responsibility for the operation and maintenance of the terminal equipment to be connected to 1.544 Mbps and/or \_\_\_\_\_ subrate digital services. The terminal equipment to be connected complies with Part 68 of the FCC rules except for the encoded analog content and billing protection specifications. With respect to encoded analog content and billing protection:

- ( ) I attest that all operations associated with the establishment, maintenance, and adjustment of the digital CPE with respect to analog content and encoded billing protection information continuously complies with Part 68 of the FCC Rules and Regulations.
- ( ) The digital CPE does not transmit digital signals containing encoded analog content or billing information which is intended to be decoded within the telecommunications network.
- ( ) The encoded analog content and billing protection is factory set and is not under the control of the customer.

I attest that the operator(s)/maintainer(s) of the digital CPE responsible for the establishment, maintenance, and adjustment of the encoded analog content and billing information has (have) been trained to perform these functions by successfully having completed one of the following (check appropriate blocks):

- ( ) A. A training course provided by the manufacturer/grantee of the equipment used to encode analog signals; or
- ( ) B. A training course provided by the customer or authorized representative, using training materials and instructions provided by the manufacturer/grantee of the equipment used to encode analog signals; or

- ( ) C. An independent training course (e.g., trade school or technical institution) recognized by the manufacturer/grantee of the equipment used to encode analog signals; or
- ( ) D. In lieu of the preceding training requirements, the operator(s)/maintainer(s) is (are) under the control of a supervisor trained in accordance with \_\_\_\_\_ (circle one) above.

I agree to provide \_\_\_\_\_ (telco's name) with proper documentation to demonstrate compliance with the information as provided in the preceding paragraph, if so requested.

\_\_\_\_\_ Signature

\_\_\_\_\_ Title

\_\_\_\_\_ Date

Transcribed and sworn to before me

This \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_

\_\_\_\_\_

Notary Public

My commission expires:

\_\_\_\_\_

## Canadian Equipment Limitations



*The Industry Canada Certification label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department of Commerce does not guarantee the equipment will operate to the user's satisfaction.*

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic waterpipe system, if present, are connected together. This precaution may be particularly important in rural areas.



*Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or an electrician, as appropriate.*

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the equipment that the total of the LNs of all devices does not exceed 100.

The ringer equivalence number (REN) assigned to each terminal adapter is used to determine the total number of devices that may be connected to each circuit. The sum of the RENs from all devices in the circuit should not exceed a total of 5.0.

## Warranty and Customer Service

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

A return material authorization (RMA) is required prior to returning equipment to ADTRAN.

For service, RMA requests, or more information, see the last page of this manual for the toll-free contact number.





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## QUAD T1/PRI MODULE OVERVIEW

The Quad T1/PRI Module (P/N 1200185L3) is a member of the ATLAS family of integrated access products and provides four channelized T1 or Primary Rate ISDN (PRI) interfaces. Each interface can operate independently in DS-1 or DSX-1 mode, and any port can serve as the primary or backup timing source for the entire system.

The Quad T1/PRI Module combines with the ATLAS Base Unit and other ATLAS modules to support requirements calling for multiple T1 and/or PRI circuits. You can install into the system as many Quad T1/PRI Modules as can be physically accommodated in the ATLAS chassis.

Typical applications calling for ATLAS and the Quad T1/PRI Module include the following:

- Digital Access Cross Connect System (DACCS). Any DS0 on any T1 circuit can be switched to any other DS0 on any other T1 circuit.
- T1 Bandwidth Management. T1 circuits carrying voice, data, video, and other traffic can have their payload groomed and directed to the appropriate interface inside the ATLAS system (see Figure 1-1).
- ISDN Access Switch. When combined with the Octal BRI/U Module (P/N 1200186L1, L2), the Quad T1/PRI Module can combine multiple Basic Rate ISDN (BRI) circuits onto one or more Primary Rate ISDN (PRI) circuits.

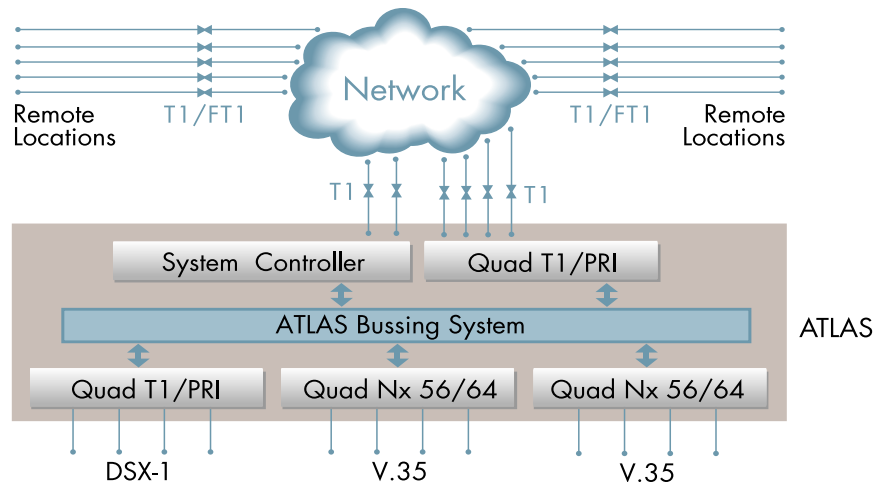


Figure 1-1. T1 Bandwidth Management Application

## NEBS COMPLIANCE

The ATLAS Quad T1/PRI Module (P/N 1200185L3) complies with the NEBS (Network Equipment Building System) Level III specification for GR-1089-CORE and GR-63-CORE. This means that the ATLAS Quad T1/PRI Module will perform normally under certain electrical and physical stresses without posing a safety hazard to its users. This module can be used in either the ATLAS 800 or the ATLAS 800<sup>PLUS</sup>. However, when applications require NEBS compliance, this module should be used in the ATLAS 810<sup>PLUS</sup> (a NEBS-compliant version of the ATLAS 800<sup>PLUS</sup>).

## FUNCTIONAL DESCRIPTION

The Quad T1/PRI Module installs into any available option slot in the ATLAS chassis. You can view the status of the module itself, as well as the circuits to which it interfaces, from the ATLAS front panel. Additional status information is available via the terminal menu, accessible through either a VT-100 terminal connected to the ATLAS Base Unit's control port or through a Telnet session established through the Base Unit's Ethernet port. Use the terminal menu to configure the Quad T1/PRI Module and to download application software.

## Features

Features of the Quad T1/PRI Module are listed here:

- Four T1 interfaces
- Each interface configurable for DS-1, DSX-1, or PRI
- AT&T 62411 and ANSI T1.403 compliant
- Diagnostic loopback support
- Various timing options
- T1 ESF diagnostics
- Bantum monitor jacks on each interface
- Performance per ANSI T1.403, AT&T 54016, and ANSI T1.102
- RJ-48C network interface connector
- AMI or B8ZS coding
- ESF or SF(D4) framing
- Line build-out settings:
  - DSX-1: 0 to 655 feet in 133-foot increments
  - DS-1: -22.5, -15, -7.5, and 0 dB
- Monitor jack
- Line loopback (VT-100/remote/in-band)
- Payload loopback

- PRI switch support for the following switches:
  - AT&T 5ESS NT or LT
  - Nortel DMS-100 NT or LT
  - NI-2 NT (network termination)
- Supports the inherent DACS capability of the ATLAS
- Reports line performance data via SNMP in RFC1406 format
- Trunk conditioning

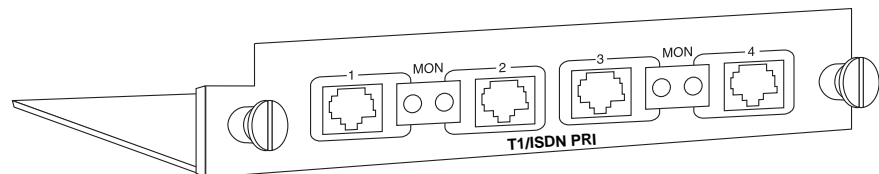
## Quad T1/PRI Module Specifications

Each port of the Quad T1/PRI Module conforms to the following specifications:

Line rate	1.544 Mbps, $\pm 75$ bps
Capacity	T1: 1 to 24 DS0s PRI: 23 B + D
Line Codes	AMI (alternate mark inversion) or B8ZS (bipolar return to zero)
Framing	D4 or ESF
Tests	Self-test, line loopback, port loopback
Connectors	RJ-48C (eight-position modular jack)
Terminating Impedance	100 ohms $\pm 5\%$

## PHYSICAL DESCRIPTION

The Quad T1/PRI Module (see Figure 1-2) plugs into any available option slot in the rear of the ATLAS chassis.



**Figure 1-2. Quad T1/PRI Module**

The Quad T1/PRI Module design includes a label above each RJ-48C connector identifying the port on the card. Each port comes with an RJ-48C connector for the T1 circuit interface and a single Bantam plug for monitoring received data.



## BEFORE INSTALLING THE QUAD T1/PRI MODULE

Carefully unpack and inspect the Quad T1/PRI Module for shipping damages. If you suspect damage occurred during shipping, file a claim immediately with the carrier and then contact ADTRAN Technical Support (see the last page of this manual for pertinent information). If possible, keep the original shipping container for returning the Quad T1/PRI Module for repair or for verification of shipping damage.

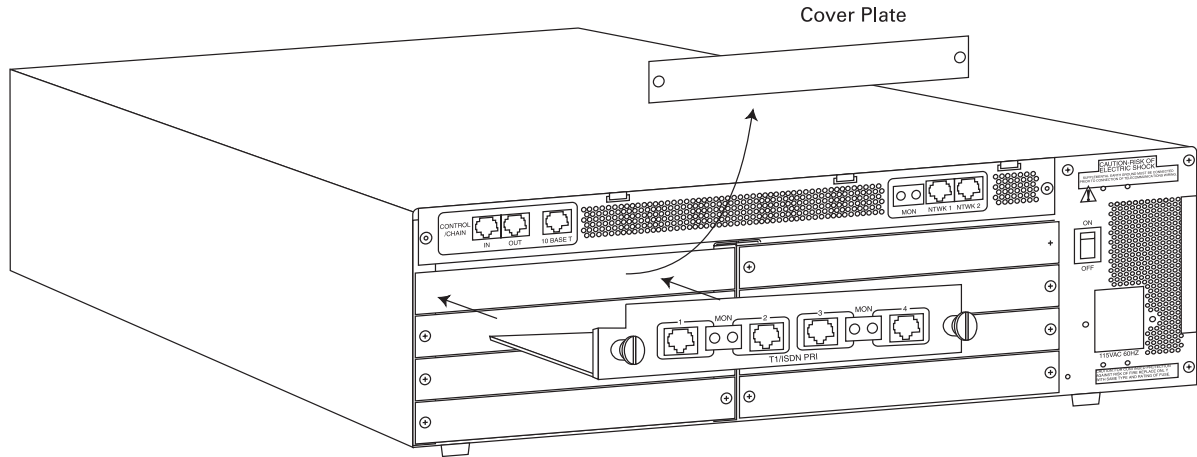
## Shipping Contents

The ADTRAN shipment includes the following items:

- Quad T1/PRI Module
- Quad T1/PRI Module *User Manual* (insert into the *ATLAS User Manual*)
- Four cables (RJ-48C to RJ-48C), ADTRAN P/N: 3125M008
- Two crossover cables (RJ-48C to RJ-48C), ADTRAN P/N: 3125M010
- Two RJ-48 to DB-15 adapters

## INSTALLING THE QUAD T1/PRI MODULE

Figure 2-1 on page 2-2 represents the action required to properly install the Quad T1/PRI Module, as described in the Step/Action table on page 2-2.



**Figure 2-1. Installing the Quad T1/PRI Module**

Instructions for Installing the Quad T1/PRI Module	
Step	Action
1	Remove the cover plate from the appropriate option slot of the ATLAS rear panel.
2	Slide the Quad T1/PRI Module into the option slot until the module is firmly positioned against the front of the chassis.
3	Secure the thumbscrews at both edges of the module.



*To ensure that the thumbscrews are securely fastened, use a screwdriver to tighten them.*

## WIRING

Each port of the Quad T1/PRI Module uses a single, eight-position modular jack to connect to the T1 or PRI circuit. Table 2-1 on page 2-3 gives the pinout for this jack. The required wiring connection is described here:

**Connector Type** (USOC) RJ-48C

**Table 2-1. Network Connection Pinout**

<b>PIN</b>	<b>NAME</b>	<b>DESCRIPTION</b>
1	R1 RXDATA	Receive data from the network ring
2	T1 RXDATA	Receive data from the network tip
3	UNUSED	—
4	R TXDATA	Send data towards the network ring
5	T TXDATA	Send data towards the network tip
6,7,8	UNUSED	—





## OVERVIEW

You can configure and control the Quad T1/PRI Module from a variety of sources, including the following:

- The ATLAS front panel, providing minimal configuration and status support
- The terminal menu, allowing detailed configuration, status, and diagnostics
- SNMP, primarily for reporting alarm conditions and system status

The remainder of this chapter describes the menu items available when managing the Quad T1/PRI Module via the terminal menu.

Access the terminal menu using either a VT-100 terminal attached to the ATLAS Base Unit's control port or a Telnet session established through the Base Unit's Ethernet port. The *ATLAS User Manual* provides detailed instructions on the operation of each of these management approaches.

**NOTE**

*To edit items in the terminal menu, you must have the appropriate password level. Each menu description in this section indicates the password level required for write and read access. See "Access Passwords" in the *ATLAS User Manual* for detailed information on working with passwords.*

*Security level 0 users can view and edit every available field. Security level 5 users can view any field but cannot edit.*

## TERMINAL MENU STRUCTURE

ATLAS uses a hierarchical menu structure to provide access to all of its features. The top-most menu level leads to submenus which are grouped by functionality. All menu items display in the terminal window. To access the Quad T1/PRI Module, activate the **MODULES** menu. The following sections describe the menu items for the **MODULES** menu.

**NOTE**

*Refer to the *ATLAS User Manual* for detailed instructions on navigating through the terminal menu.*

## MODULES

The ATLAS system controller automatically detects the presence of the Quad T1/PRI Module when it is installed in the system. To see the menus for the Quad T1/PRI 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 (see also the menu tree in Figure 3-2).

System Info	SlT	Type	Menu	Alarm	Test	State	Status	Rev
System Status	0	Sys Ctrl	[+]	[ALARM]	[OFF]	ONLINE	Online	A
System Config	1	T3 D&I	[+]	[n/a]	[n/a]	ONLINE	No Response	-
System Utility	2	T1/PRI	[+]	[n/a]	[n/a]	ONLINE	No Response	-
Modules	3	ASYNC232	[+]	[n/a]	[n/a]	ONLINE	No Response	-
Dedicated Maps	4	U-BRI	[+]	[n/a]	[n/a]	ONLINE	No Response	-
Dial Plan	5	T3	[+]	[n/a]	[n/a]	ONLINE	No Response	-
	6	M56K-16	[+]	n/a	n/a	ONLINE	No Response	-
	7	EMPTY	[+]			ONLINE	Empty	-
	8	U35Nx	[+]	[n/a]	[n/a]	ONLINE	No Response	-

SVS: OK CSU:ALRM 1:ALRM 2:ALRM 3:ALRM 4:ALRM 5:ALRM 6:ALRM 7: -- 8:ALRM  
 Access menus for Quad T1/Pri ^Z=help 19:58

Figure 3-1. Modules Menu

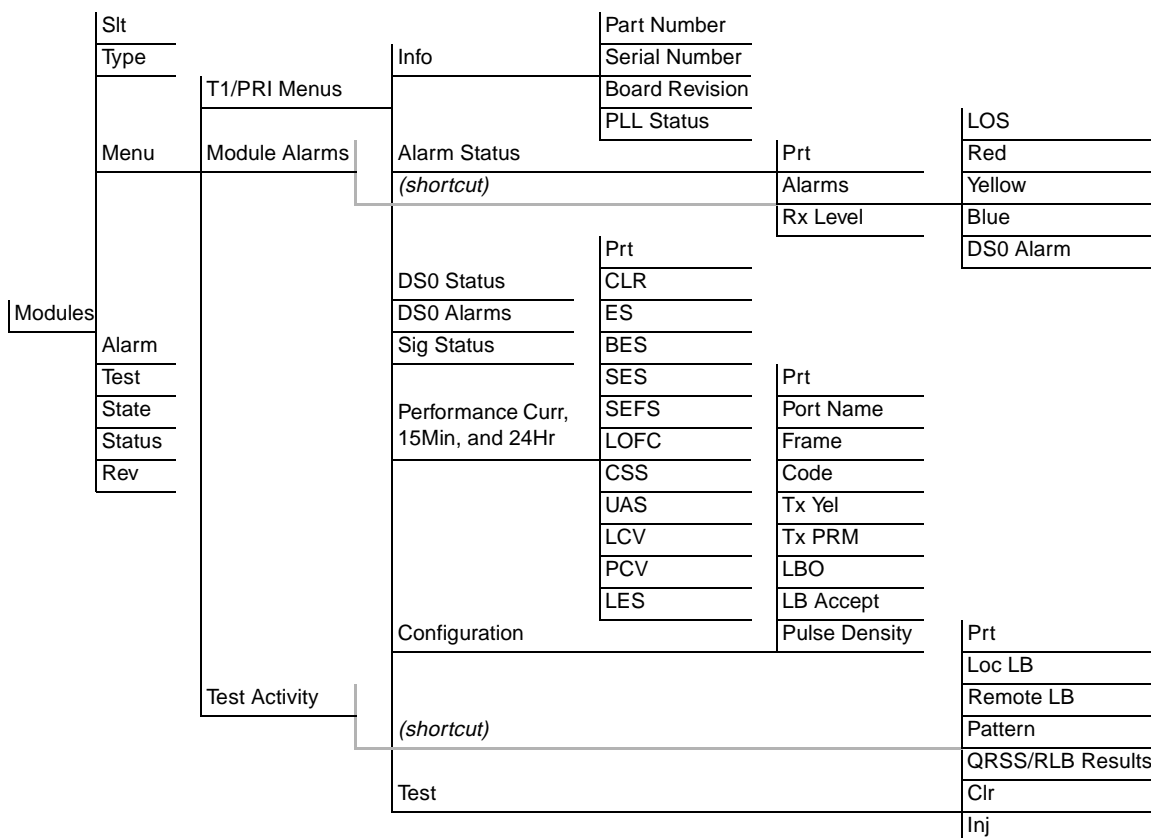



Figure 3-2. Menu Tree for Quad T1/PRI Modules Menu

<b>SLT</b>	<p>Read security: 5          Displays the slot number for available option slots in the ATLAS chassis. Slot 0 refers to the ATLAS Base Unit. This field is read-only.</p>
<b>TYPE</b>	<p>Write security: 3; Read security: 5          Displays the type of module currently installed in the slot or the type of module you plan to install in the slot. If a Quad T1/PRI Module is installed, the Type field automatically defaults to T1/PRI-4 (the Quad T1/PRI Module). You can also use this field to preconfigure a system before installing modules by specifying the module that you want to install into each slot.</p>
<div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;">  <p><b>NOTE</b> <i>TYPE automatically displays the name of an installed module. If you want to change this field to a different type of module, you must set TYPE to <b>EMPTY</b> before selecting the other module.</i></p> </div>	
<b>MENU</b>	<p>Displays additional status and configuration menus for 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 <b>ENTER</b>.) For detailed information on each submenu item, see <i>Modules/Menu</i> on page 3-4.</p>
<b>ALARM</b>	<p>Read security: 5          Displays an alarm condition on the Quad T1/PRI Module. Press <b>ENTER</b> in this field to activate the Alarm menu.</p>
<b>TEST</b>	<p>Read security: 5          Displays tests that the Quad T1/PRI Module is executing. Press <b>ENTER</b> in this field to activate the Test menu.</p>
<b>STATE</b>	<p>Write security: 3; Read security: 5          Indicates the module status, either online or offline. Even though a module is physically installed, it must be marked Online to be considered an available resource. You can mark an installed module “Offline,” which may be useful in system troubleshooting. If you choose Offline, the module will not be in alarm condition, but will display “Offline.”</p>



**NOTE** *A module must be in the Online state in order for ATLAS to use the module for any data bandwidth.*

<b>STATUS</b>	Read security: 5 Read-only field that presents status information on the Quad T1/PRI Module. The following messages may display:
<b>ONLINE</b>	The module is enabled and is responding to the system controller's status polls. This is the normal response of the system.
<b>NO RESPONSE</b>	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.
<b>EMPTY</b>	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.
<b>OFFLINE</b>	The module is installed, but has been taken Offline by a user. The module is still responding to controller polls.
<b>OFFLINE/NO RESPONSE</b>	The module is installed, but has been taken Offline by a user. The module is not responding to controller polls.
<b>REV</b>	Read security: 5 (Hardware Revision) Read-only field that displays the hardware revision of the Quad T1/PRI Module.

## MODULES/MENU

Figure 3-3 shows the **MODULES/MENU** options. The following sections describe these menu options. (Refer also to the menu tree shown in Figure 3-2.)

```

T1/PRI Menu  Info          [+]
Module Alarms Alarm Status  [+]
Test Activity DS0 Status   [+]
              DS0 Alarms  [+]
              Sig Status   [+]
              Performance Curr [+]
              Performance 15Min [+]
              Performance 24Hr [+]
              Configuration  [+]
              Test          [+]

SYS: OK  CSU:ALRM  1:ALRM 2:ALRM 3:ALRM 4:ALRM 5:ALRM 6:ALRM 7: -- 8:ALRM
Access menus for Quad T1/Pri          ^Z=help 19:57

```

Figure 3-3. Quad T1/PRI Menu Options

---

<b>INFO</b>	Read security: 5 Indicates the module status.
<b>PART NUMBER</b>	Displays the part number of the module (read-only).
<b>SERIAL NUMBER</b>	Displays the serial number of the module (read-only).
<b>PLL STATUS</b>	Indicates whether the clock is locked to its specific source.
<b>BOARD REVISION</b>	Displays the PCB revision (read-only).
<b>ALARM STATUS</b>	Read security: 5 Displays the current T1 alarm status.
<b>PRT</b>	Indicates the port number.
<b>ALARMS</b>	Read security: 5 Displays an alarm condition on the ATLAS unit. Press <b>ENTER</b> to access this menu item.
	<b>LOS</b> (Loss of signal) Indicates no signal detected on port interface.
	<b>RED</b> Indicates inability to frame data received on the port. Alternately referred to as Out of Frame (OOF).
	<b>YELLOW</b> Receiving remote alarm (RAI) on port.
	<b>BLUE</b> Receiving unframed all ones from the port Alarm Indicator Signal (AIS).
	<b>DS0 ALARM</b> Displays per-DS0 alarm status. These alarms usually indicate the failure to receive the protocol that has been configured for the DS0.
<b>RX LEVEL</b>	Indicates the strength of the signal (in dB) received on the port.

**DS0 STATUS**

Read security: 5

The DS0 status indicates usage on a DS0 basis for each port. These options are read-only:

- \* Inactive
- A** Active call on this DS0
- D** Active D Channel DS0
- M** Maintenance DS0
- N** Dedicated DS0
- O** Off hook Detected
- R** Ringing Detected

**DS0 ALARMS**

Read security: 5

Displays per-DS0 alarm status. These alarms usually indicate the failure to receive the protocol that has been configured for the DS0.

**SIG STATUS**

Read security: 5

Read-only field indicates signaling of all 24 DS0s. The A/B bits for Rx (receive) and Tx (transmit) DS0s are shown for each port. Dashes display for those DS0s where robbed bit signaling (RBS) is not being transferred by ATLAS.

**PERFORMANCE  
CURRENT**

Write security: 4; Read security: 5

The performance fields (either current, 15-minute total, or 24-hour total) provide status on key performance measures as specified in ANSI T1.403 and AT&T TR54016 for each of the four T1/PRI ports. Excepting **CLR**, these fields are all read-only. The monitored parameters include the following:

- PRT** Displays the port number.
- CLR** Clears performance information for the selected port.
- ES** An Errored Seconds (ES) is a second with one or more error events OR one or more Out Of Frame events OR one or more Controlled Slips.
- BES** A Bursty Errored Seconds (BES) is a second with more than one, but less than 320 error events.
- SES** A Severely Errored Second (SES) is a second with 320 or more error events OR one or more Out Of Frame events.
- SEFS** Severely Errored Frame Seconds.
- LOFC** Loss of Frame Count.
- CSS** Controlled Slip Seconds.

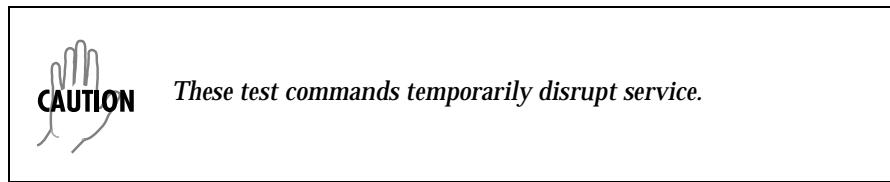
<b>UAS</b>	Unavailable Seconds.
<b>LCV</b>	Line Code Violations.
<b>PCV</b>	Path Code Violations.
<b>LES</b>	Line Errored Seconds.
<b>PERFORMANCE 15MIN</b>	Write security: 4; Read security: 5 Stores the performance data for the previous 15-minute window. Refer to <i>Performance Current</i> on page 3-6 for a detailed description of these fields.
<b>PERFORMANCE 24HR</b>	Write security: 4; Read security: 5 Stores the performance data for the previous 24-hour window. Refer to <i>Performance Current</i> on page 3-6 for a detailed description.
<b>CONFIGURATION</b>	All of the following configurable parameters apply to whether the port is connected to a Primary Rate ISDN circuit or a channelized T1 circuit.
<b>PRT</b>	Read security: 5 Displays the port number.
<b>PORT NAME</b>	Write security: 3; Read security: 5 Accepts any alpha-numeric name up to 16 characters long, to uniquely identify each port on the Quad T1/PRI Module.
<b>FRAME</b>	Write security: 2; Read security: 5 This field must be set to match the frame format of the circuit to which it is connected, available from the network supplier. Choose either <b>D4</b> or <b>ESF</b> .
<b>CODE</b>	Write security: 2; Read security: 5 Set this field to match the line code of the circuit to which it is connected (this information is available from the network supplier). Choose either <b>AMI</b> or <b>B8ZS</b> .
<b>Tx YEL</b>	Write security: 3; Read security: 5 Controls the transmitting of yellow alarms. Choose either <b>ON</b> or <b>OFF</b> .
<b>Tx PRM</b>	Write security: 3; Read security: 5 Controls the sending of performance report messaging (PRM) data on the facility data link (FDL). The PRM data continues to be collected even if <b>XMIT PRM</b> is turned off (possible only with ESF format). Choose either <b>ON</b> or <b>OFF</b> .

**LBO** Write security: 2; Read security: 5  
Selects the Line Build Out (LBO) for the network interface. When connecting a Quad T1/PRI Module port to a DSX-1 interface, this parameter is typically set to match the distance (in feet) between ATLAS and the device with which it is connecting. When you select this item, a list of choices displays. Select the appropriate option.

**LB ACCEPT** Write security: 3; Read security: 5  
Sets unit to accept or reject the in-band loop up and loop down codes as defined in ANSI T1.403. This is a line loopback. Choose either **ACCEPT** or **IGNORE**.

**PULSE DENSITY** Write security: 3; Read security: 5  
Choose either **ON** or **OFF**. When **ON**, Pulse Density Enforcer causes the ATLAS to monitor for ones (1s) density violations and insert a one (1) when needed to maintain ones at 12.5% This data insertion will cause data errors.

**TEST** Write security: 4; Read security: 5  
These options initiate different types of tests and display test results.



**PRT** Read security: 5  
Displays the port number.

**LOC LB** Write security: 4; Read security: 5  
Causes loopback on near-end (local) port (see Figure 3-4 on page 3-9). The following options are available:

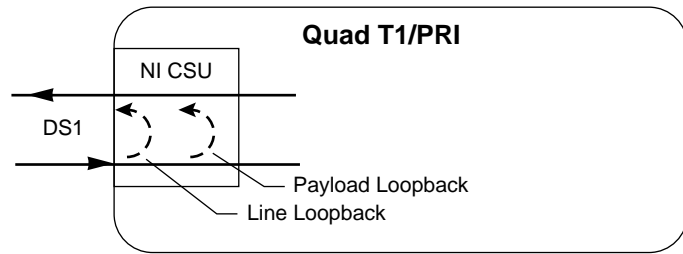
**LINE**

Metallic loopback

**PAYLD**

Payload loopback - framing and clocking are regenerated





**Figure 3-4. Network Loopback Test**

<b>REMOTE LB</b>	Write security: 4; Read security: 5 Sends loopback code to Remote CSU. The following options are available:  <b>ANSI FDL LINE</b> Requires ESF mode.  <b>ANSI FDL PYLD</b> Requires ESF mode.  <b>AT&amp;T INBAND LINE</b> Works in ESF and D4 mode.
<b>PATTERN</b>	Write security: 4; Read security: 5 Test pattern to be transmitted out the port. The following options are available:  <b>ALL ONES</b> Framed ones  <b>ALL ZEROS</b> Framed zeros  <b>QRSS</b> Pseudo-random pattern with suppression of excess zeros
<b>QRSS/RLB RESULTS</b>	Write security: 4; Read security: 5 Indicates sync and errors of received data pattern (Test Pattern and Remote Loopback Results).
<b>CLR</b>	Write security: 4; Read security: 5 Clears error counters on test pattern results menu.
<b>INJ</b>	Write security: 4; Read security: 5 Injects errors into transmitted test pattern.

## ATLAS FEATURES USED WITH QUAD T1/PRI MODULE

In addition to the Quad T1/PRI Module menu items, two other ATLAS menu items may be operated in conjunction with the Quad T1/PRI Module. These are **FACTORY RESTORE** and **RUN SELF TEST**.

---

### FACTORY RESTORE

**FACTORY RESTORE** restores the factory-installed default setting for all Quad T1/PRI Module parameters. When *Factory Restore* displays, place the cursor on it and press **Enter**. The unit is restored to preset factory defaults and returns to the main ATLAS menu.

---

### RUN SELF TEST

**RUN SELF TEST**, a submenu of the ATLAS main menu item **TEST**, executes both the Quad T1/PRI Module internal test and the ATLAS internal test. For additional information on **SELF TEST** see the *ATLAS User Manual*.

## MAPPING

DSOs are used as defined in the **DEDICATED MAP** or in the **DIAL PLAN** for switched applications. (See the *ATLAS User Manual* for a description.)



*Defining a port as a T1 or PRI is determined by the way it is assigned in the **DEDICATED MAP** or in the **DIAL PLAN**. See Appendix A of this manual for more information on setting up the **DIAL PLAN**.*

# Dial Plan Interface Configuration

The interface configuration options for the **DIAL PLAN** menu set configuration parameters for the endpoint. These parameters vary by the type of port selected. This appendix describes the configuration options available for the ATLAS. The **DIAL PLAN** menus are only accessible when using terminal mode. To access these options, select **DIAL PLAN** from the top level ATLAS menu (see Figure A-1.)



**NOTE** The Write security level for all **DIAL PLAN** options is 3.

```
ATLAS 800/Dial Plan
System Info      Network Term [+1]
System Status    User Term   [+1]
System Config    Global Param [+1]
System Utility
Modules
Dedicated Maps
Dial Plan

SYS=ALHM CSU:ONLN 1: -- 2: -- 3: -- 4: -- 5: -- 6: -- 7: -- 8: --
*Z=help 18:10
```

Figure A-1. Dial Plan Menus

## QUAD T1/PRI MODULE INTERFACE CONFIGURATION

The remainder of this appendix discusses the following network and user termination configuration settings for the ATLAS when using the **DIAL PLAN** menus:

- *Quad T1/PRI Module: Network Termination/PRI* on page A-2
- *Quad T1/PRI Module: Network Termination/RBS* on page A-4
- *Quad T1/PRI Module: User Termination/PRI* on page A-6
- *Quad T1/PRI Module: User Termination/RBS* on page A-7

## QUAD T1/PRI MODULE: NETWORK TERMINATION/PRI

When you are working in the network termination section of the **DIAL PLAN** menu, when **SLT** is defined as a Quad T1/PRI Module, and when **SIG** is set to PRI, the following configuration options are available:

### SWITCH TYPE

Write security: 3; Read security: 5

Defines the type of PRI switch to which the port is connected. If connected to another ATLAS, both need to be set to the same switch type. The following options are available:

- Lucent 5E
- Northern DMS 100
- National ISDN
- AT&T 4ESS

### FIRST DS0

Write security: 3; Read security: 5

Defines to ATLAS the first DS0 for this endpoint. ATLAS uses DS0s, starting with this selection, to send and receive calls to and from the network (PSTN). The outgoing calls which are allowed or restricted over these DS0s are set by the **OUTGOING CALL ACCEPT** and **REJECT NUMBERS** (discussed in the *ATLAS User Manual*).

### NUMBER OF DS0S

Write security: 3; Read security: 5

Specifies the number of DS0s ATLAS uses for this endpoint.

## OUTGOING NUMBER CONVERSION

	Write security: 3; Read security: 5 Converts outgoing (towards the network) numbers to the selected numbering plan and type option.
<b>AS DIALED (DEFAULT)</b>	Makes a number conversion. The outgoing numbering plan and type are forwarded to the network as received and digits are passed "As dialed."
<b>ISDN-NATIONAL PREFERRED</b>	Regardless of the type of number received, the outgoing number is substituted with ISDN-National as the number plan and type. Ten digits are always sent to the network. Leading ones, if present, are stripped out and the area code (provisioned under <b>DIAL PLAN/GLOBAL PARAMETERS</b> ) is added, if only seven digits are supplied. This action may be required in areas with ten digit local dialing.
<b>ISDN-SUBSCRIBER PREFERRED</b>	Examines the incoming number and if seven digits are received or if a ten-digit number is received with an area code that matches the area code provisioned in the global parameters, the number is forwarded to the network as a seven-digit number defined as ISDN-Subscriber number plan and type. If the incoming number is ten digits, but with a different area code, it is forwarded to the network as ISDN-National preferred.
<b>ISDN-NATIONAL DMS RESERVED PREFERRED</b>	Ignores the incoming numbering plan and type and substitutes the ISDN/Telephony numbering plan and National number type. Ten digits are sent to the network. Leading ones, if present, are stripped out and the area code set in global parameters is added if only seven digits are supplied. This action may be required in areas with ten-digit local dialing.

## NETWORK SPECIFIC FACILITY

Write: 3; Read: 5  
Enables the sending of appropriate information to the PSTN. The default for this option is **NORMAL**, and in this case no Network Specific Facility Information Element is sent. Unless one of the services listed below is subscribed to, the selection should remain set to **NORMAL**.

The list below indicates services that may be subscribed to from the PSTN. These services require that specific information (such as a Network Specific Facility Information Element) be sent to the network during call setup.

- AT&T SDN
- AT&T Megacom 800
  - AT&T Megacom
  - AT&T Accunet
- AT&T Long Distance
- AT&T International-800
- AT&T Dial-It 900/Multiquest
- National ISDN INWATS
- Nortel Private Network
- Nortel InWats
- Nortel OutWats
- Nortel Foreign Exchange
- Nortel Tie Trunk

**CALLED DIGITS TRANSFERRED**

Write security: 2; Read security: 5  
 Some PRI switches may be provisioned to send only a portion of the called number (like DID). This menu item allows ATLAS to know how many digits to expect (choose from **NONE**, **THREE**, **FOUR**, and **ALL**). The default is **ALL** and would almost always be correct. If less than **ALL** digits are sent, then the **PREFIX** is defined as shown below.

**PREFIX**

Write security: 2; Read security: 5  
 Displays only if **CALLED DIGITS TRANSFERRED** is not set to **ALL**. Enter the prefix for the digits received.

**EXAMPLE:**

If the number of digits is four and the number called is 963-8005, the telco's PRI switch sends only 8005 and the prefix is set to 963. This entire number is then used to determine which ATLAS User port endpoint should receive the call.

**OUTGOING CALLER ID**

Write security: 3; Read security: 5  
 Defines the number for ATLAS to use to provide Caller ID to the Network for outgoing calls sent through this endpoint. This option only displays if **DIRECT INWARD DIALING** is set to **DISABLED**. This item is optional.



**NOTE** *The Caller ID number must be specific (i.e., no "wild cards").*

**QUAD T1/PRI MODULE: NETWORK TERMINATION/RBS**

When you are working in the network termination section of the **DIAL PLAN** menu, when **SLT** is defined as a Quad T1/PRI Module, and when **SIG** is set to RBS, the following interface configuration options are available:

**FIRST DS0**

Write security: 3; Read security: 5  
 Defines to ATLAS the first DS0 for this endpoint. ATLAS uses DS0s, starting with this selection, to send and receive calls to and from the network (PSTN). The outgoing calls which are allowed or restricted over these DS0s are set by the **OUTGOING CALL ACCEPT** and **REJECT NUMBERS** (discussed in the *ATLAS User Manual*).

**NUMBER OF DS0S**

Write security: 3; Read security: 5  
 Specifies the number of DS0s ATLAS uses for this endpoint.

**DS0S AVAILABLE**

Read security: 5  
 Indicates which DS0s of the T1 have been defined in this switched endpoint (indicated by "!"), in another switched endpoint (indicated by "s"), or in a

**DEDICATED MAP** (indicated by “n”). This field is read-only. The following characters may display in this field:

**digits 0-9** This DS0 is available. The digit that displays in this field represents the last digit of the DS0 number.

\* This port is requesting this DS0 for this connection, but the DS0 is not yet activated.

! This DS0 is used by this endpoint.

s This DS0 is used elsewhere in the switched **DIAL PLAN**.

S This DS0 is in the switched dial plan and conflicts with this endpoint.

n This DS0 is used in one or more **DEDICATED MAPS**.

N This DS0 is in one or more **DEDICATED MAPS**, and conflicts with this endpoint.

## SIGNALING METHOD

Write security: 3; Read security: 5

Defines to ATLAS the type of signaling to be used across this trunk. The signaling selected needs to match the signaling being provided by the network (PSTN). The following choices are available:

- E&M Immediate
- E&M Wink
- Loop Start
- Ground Start

## DID

Write security: 3; Read security: 5

Defines to ATLAS whether Direct Inward Dialing (DID) is being used by the network. If **DID** is **ENABLED**, then the following information must be defined:

### DID DIGITS TRANSFERRED

Write security: 3; Read security: 5

Defines the number of digits sent to ATLAS from the network if **DID** is used.

### DID PREFIX

Write security: 3; Read security: 5

Defines to ATLAS the prefix digits which are not received as a part of the DID number. ATLAS uses the combination of prefix and DID number to determine the user endpoint that should receive the incoming call. This option only displays if **DID** is set to **ENABLED**. If **DID** is **DISABLED**, then you must define the trunk number.

**TRUNK NUMBER**

Write security: 3; Read security: 5

When the network connection does not provide DID digits, ATLAS must be given a number to use to determine which user endpoint should receive the incoming call. **TRUNK NUMBER** displays only when **DID** is set to **DISABLED**.



**NOTE** *The trunk number must be specific (i.e., no “wild cards”).*

**EXAMPLE:**

To connect an incoming DS0 (trunk) to an endpoint with the **ACCEPT** number of 963-8615, set the trunk number to 963-8615.

**QUAD T1/PRI MODULE: USER TERMINATION/PRI**

When you are working in the user termination section of the **DIAL PLAN** menu, when **SLT** is defined as a T1/PRI module, and when **SIG** is set to PRI, the following configuration options are available:

**SWITCH TYPE**

Write security: 3; Read security: 5

Defines the type of PRI switch that ATLAS is going to emulate. If connected to another ATLAS, both need to be set to the same switch type.

- Lucent 5E
- AT&T 4ESS

**FIRST DS0**

Write security: 2; Read security: 5

Defines to ATLAS the first DS0 for this endpoint. ATLAS uses DS0s, starting with this selection, to send and receive calls to and from the network (PSTN). The outgoing calls which are allowed or restricted over these DS0s are set by the **OUTGOING CALL ACCEPT** and **REJECT NUMBERS** (discussed in the *ATLAS User Manual*).

**NUMBER OF DS0s**

Write security: 3; Read security: 5

Specifies the number of DS0s ATLAS uses for this endpoint.

**NETWORK  
SPECIFIC  
FACILITY**

Write: 3; Read: 5

Enables the sending of appropriate information to the PSTN. The default for this option is **NORMAL**, and in this case no Network Specific Facility information element is sent. Unless one of the services listed below is subscribed to, the selection should remain set to **NORMAL**.



The list below indicates services that may be subscribed to from the PSTN. These services require that specific information (such as a Network Specific Facility information element) be sent to the network during call setup.

- AT&T SDN
- AT&T Megacom 800
  - AT&T Megacom
  - AT&T Accunet
- AT&T Long Distance
- AT&T International-800
- AT&T Dial-It 900/Multiquest
- National ISDN INWATS
- Nortel Private Network
- Nortel InWats
- Nortel OutWats
- Nortel Foreign Exchange
- Nortel Tie Trunk

## CALLED DIGITS TRANSFERRED

Write security: 3; Read security: 5  
 Defines to ATLAS the number of digits to forward from the called number. When attached to a PBX, the PBX may be provisioned to expect to receive fewer than all of the called digits of the incoming call; however, this option would normally be set to **ALL**.

## OUTGOING CALLER ID

Write security: 3; Read security: 5  
 Defines the number for ATLAS to use to provide Caller ID to the Network for outgoing calls sent through this endpoint. This option only displays if **DIRECT INWARD DIALING** is set to **DISABLED**. This item is optional.



*The Caller ID number must be specific (i.e., no “wild cards”).*

## QUAD T1/PRI MODULE: USER TERMINATION/RBS

When you are working in the user termination section of the **DIAL PLAN** menu, when **SLT** is defined as a T1/PRI module, and when **Sig** is set to RBS, the following configuration options are available:

### FIRST DS0

Write security: 3; Read security: 5  
 Defines to ATLAS the first DS0 for this endpoint. ATLAS uses DS0s, starting with this selection, to send and receive calls to and from the network (PSTN). The outgoing calls which are allowed or restricted over these DS0s are set by the **OUTGOING CALL ACCEPT** and **REJECT NUMBERS** (discussed in the *ATLAS User Manual*).

### NUMBER OF DS0s

Write security: 3; Read security: 5  
 Specifies the number of DS0s ATLAS uses for this endpoint.

**DS0s AVAILABLE** Read security: 5  
Indicates which DS0s of the T1 have been defined in this switched endpoint (indicated by “! “), in another switched endpoint (indicated by “s”), or in a dedicated map (indicated by “n”).

**digits 0-9** This DS0 is available. The digit that displays in this field represents the last digit of the DS0 number.

\* This port is requesting this DS0 for this connection, but the DS0 is not yet activated.

! This DS0 is used by this endpoint.

s This DS0 is used elsewhere in the switched **DIAL PLAN**.

S This DS0 is in the switched dial plan and conflicts with this endpoint.

n This DS0 is used in one or more **DEDICATED MAPS**.

N This DS0 is in one or more **DEDICATED MAPS** and conflicts with this endpoint.

## SIGNALING METHOD

Write security: 3; Read security: 5  
Defines to ATLAS the type of signaling to be used across this trunk. The selected signaling must match that being used by the user equipment (PBX). The choices are as follow:

- E&M Immediate
- E&M Wink
- Loop Start
- Ground Start



*ATLAS converts signaling types between network and user terminations.*

## DID

Defines to ATLAS whether Direct Inward Dialing (DID) is used by the user equipment. If **DID** is **ENABLED**, then the following information must be defined:

### DID DIGITS TRANSFERRED

Defines the number of digits ATLAS sends on to the user equipment. This field only displays if **DID** is set to **ENABLED**.

**CALLER ID  
NUMBER**

Defines the number ATLAS uses to provide caller ID to the network for outgoing calls sent through this endpoint. This option only displays if **DID** is set to **DISABLED**. This item is optional.

**NOTE**

*The Caller ID number must be specific (i.e., no “wild cards”).*



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## 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 Custom 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 Customer and Product Service  
6767 Old Madison Pike  
Building #6 Suite 690  
Huntsville, Alabama 35807

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

