

Quad T1/PRI Module User Manual

Part Number 1200185L3

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ADTRAN Year 2000 (Y2K) Readiness Disclosure

ADTRAN has established a Year 2000 program to ensure that our products will correctly function in the new millennium. ADTRAN warrants that all products meet Year 2000 specifications regardless of model or revision. Information about ADTRAN's Year 2000 compliance program is available at the following:

Product Matrix	www.adtran.com/y2kfax.html
E-mail	year2000@adtran.com
Faxback Document Line	(256) 963-8200 Y2K plans and product certifications are listed in the Product Matrix (see above).
Y2K Project Line	(256) 963-2200

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.

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.

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 _____, ____, ____,

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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Chapter 1

Introduction

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 (DACS). 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.

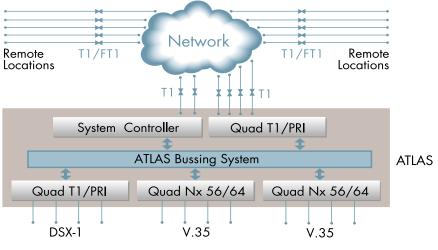


Figure 1-1. T1 Bandwidth Management Application

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^{PLUS} . However, when applications require NEBS compliance, this module should be used in the ATLAS 810^{PLUS} (a NEBS-compliant version of the ATLAS 800^{PLUS}).

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, <u>+</u> 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)

PHYSICAL DESCRIPTION

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

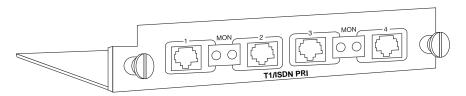


Figure 1-2. Quad T1/PRI Module

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. Chapter 2

Installation

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.

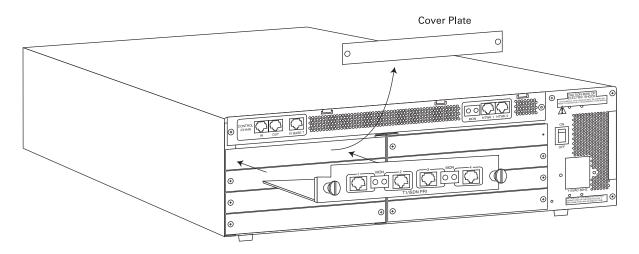


Figure 2-1. Installing the Quad T1/PRI Module

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:

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

	т	able 2-1. Network Connection Pinout
PIN	NAME	DESCRIPTION
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	_

Chapter 3

Operation

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.



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.



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).

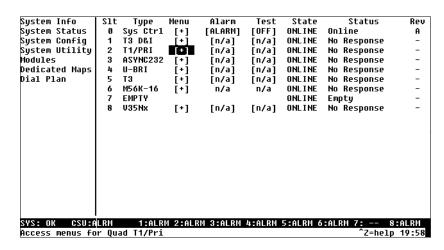


Figure 3-1. Modules Menu

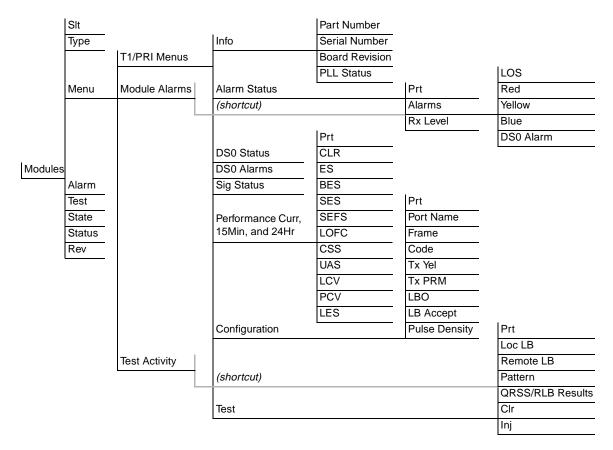


Figure 3-2. Menu Tree for Quad T1/PRI Modules Menu

SLT	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.	
Түре	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 Mod- ule). 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.	
	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 EMPTY before selecting the other module.	
Menu	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 ENTER .) For de- tailed information on each submenu item, see <i>Modules/Menu</i> on page 3-4.	
Alarm	Read security: 5 Displays an alarm condition on the Quad T1/PRI Module. Press ENTER in this field to activate the Alarm menu.	
Тезт	Read security: 5 Displays tests that the Quad T1/PRI Module is executing. Press ENTER in this field to activate the Test menu.	
State	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 avail- able 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."	
	A module must be in the Online state in order for ATLAS to use the module for any data bandwidth.	

Statu	IS	Read security: 5 Read-only field that presents status information on the Quad T1/PRI 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 sta- tus polls. This response indicates either a problem in the system or that the module is not installed.
	Емртү	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 controller polls.
Rev		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 Menus	Info	[+]
Module Alarms	Alarm Status	[+]
Test Activity	DS0 Status	[+]
_	DS0 Alarms	[+]
	Siq Status	[+]
	Performance Curr	[+]
	Performance 15Min	[+]
	Performance 24Hr	[+]
	Configuration	[+]
	Test	[+]
SYS: OK CSU:	ALRM 1:ALRM 2:A	ILRM 3:ALRM 4:ALRM 5:ALRM 6:ALRM 7: 8:ALRM
	or Quad T1/Pri	^Z=help 19:57

Figure 3-3. Quad T1/PRI Menu Options

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

UAS	Unavailable Seconds.		
LCV	Line Code Violations.		
PCV	Path Code Violations.		
LES	Line Errored Seconds.		
Performance 15Min	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.		
PERFORMANCE 24HR	Write security: 4; Read security: 5 Stores the performance data for the previous 24-hour window. Refer to <i>Per-</i> <i>formance Current</i> on page 3-6 for a detailed description.		
CONFIGURATION	All of the following configurable parameters apply to whether the port is connected to a Primary Rate ISDN circuit or a channelized T1 circuit.		
Prt	Read security: 5 Displays the port number.		
PORT NAME	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.		
FRAME	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 D4 or ESF .		
Code	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 AMI or B8ZS .		
Tx Yel	Write security: 3; Read security: 5 Controls the transmitting of yellow alarms. Choose either ON or OFF .		
Tx PRM	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 XMIT PRM is turned off (possible only with ESF format). Choose either ON or OFF .		

	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 trically 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 display 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.		
		CAUTION These test commands temporarily disrupt service.		

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

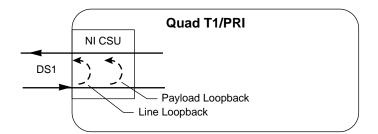


Figure 3-4. Network Loopback Test

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

FACTORYFACTORY RESTORE restores the factory-installed default setting for all QuadRESTORET1/PRI Module parameters. When Factory Restore displays, place the cursor
on it and press Enter. The unit is restored to preset factory defaults and re-
turns 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

DS0s 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. Appendix A

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.)



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

ATLAS 800/Dial System Info System Config System Utility Modules Dedicated Maps Dial Plan	Plan Network Term User Term Global Param	[+] [+] [+]			
SYS FALRN CSU FO	NLN 1:	2: 3:	4: 5:	- 6:	/=8: ^Z=helo 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 DSOS 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 number- ing plan and type option.			
As dialed (default)	Makes a number conversion. The outgoing numbering plan and type are forwarded to the network as received and digits are passed "As dialed."			
ISDN-NATIONAL PREFERRED	Regardless of the type of number received, the outgoing number is substi- tuted 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 DIAL PLAN/GLOBAL PARAMETERS) is added, if only seven digits are supplied. This action may be required in areas with ten digit local dialing.			
ISDN-SUBSCRIBER PREFERRED	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 pro- visioned 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 for- warded to the network as ISDN-National preferred.			
ISDN-NATIONAL DMS RESERVED PREFERRED	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 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 dig- its 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 DS0Write security: 3; Read security: 5
Defines to ATLAS the first DS0 for this endpoint. ATLAS uses DS0s, start-
ing 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).

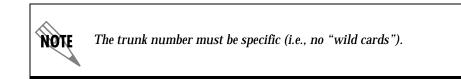
- **NUMBER OF DSOS** Write security: 3; Read security: 5 Specifies the number of DS0s ATLAS uses for this endpoint.
- **DSOS AVAILABLE** Read security: 5 Indicates which DS0s of the T1 have been defined in this switched endpoint (indicated by "! "), in another switched endpoint (indicated by "s"), or 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 .
	Ν	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**.



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

NETWORK	Write: 3; Read: 5
SPECIFIC	Enables the sending of appropriate information to the PSTN. The default
FACILITY	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 sub-
	scribed 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	National ISDN INWATS	
	• AT&T Megacom 800	Nortel Private Network	
	- AT&T Megacom	Nortel InWats	
	- AT&T Accunet	Nortel OutWats	
	AT&T Long Distance	Nortel Foreign Exchange	
	AT&T International-800	Nortel Tie Trunk	
	AT&T Dial-It 900/Multique	st	
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.		
	NOTE The Caller ID number n	nust 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 DS0Write security: 3; Read security: 5
Defines to ATLAS the first DS0 for this endpoint. ATLAS uses DS0s, start-
ing 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. This DS0 is used in one or more **DEDICATED MAPS**. n This DS0 is in one or more **DEDICATED MAPS** and conflicts Ν with this endpoint. SIGNALING Write security: 3; Read security: 5 Defines to ATLAS the type of signaling to be used across this trunk. The **METHOD** 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 ٠ **Ground Start** ATLAS converts signaling types between network and user NØTE terminations. DID Defines to ATLAS whether Direct Inward Dialing (DID) is used by the user

DID DIGITSDefines the number of digits ATLAS sends on to the user equipment. ThisTRANSFERREDfield only displays if DID is set to ENABLED.

defined:

equipment. If **DID** is **ENABLED**, then the following information must be

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.



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 # _____