



Octal E&M Module User Manual

Part Number 1200313L1



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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

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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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OCTAL E&M MODULE OVERVIEW

The Octal E&M Module is a member of the ATLAS 550 family of products. It provides eight analog voice-grade interfaces, either 2-wire or 4-wire, for use as tie-trunks using E&M signaling or as dedicated transmission only (TO) interfaces for additional data services.

Functional Description

The Octal E&M Module installs in any available user option slot in the ATLAS 550 chassis. Status information is available via the terminal menus, accessible through either a VT-100 terminal connected to the ATLAS 550 control port or via a Telnet session established through the Base Unit's Ethernet port. Use the terminal menu to configure the Octal E&M Module and to download application software upgrades.

Features

The features of the Octal E&M Module are listed below:

- Eight voice ports
- Selectable for 2-wire or 4-wire voice interface, per port
- E-lead originate
- E&M type I, I, III, IV, V plus TO mode, per port
- E&M type V can be used for Press-To-Talk (PTT) radio applications
- Resource Module connector
- Hot-swappable
- Flash download firmware

Physical Description

The Octal E&M Module plugs into any available option slot in the rear of the ATLAS 550 chassis. Figure 1-1 shows the Octal E&M Module.

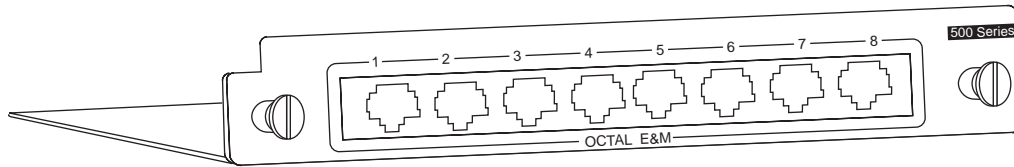


Figure 1-1. Octal E&M Module

The labels over the modular connectors refer to the corresponding port on the Octal E&M Module.

BEFORE INSTALLING THE OCTAL E&M MODULE

Carefully unpack and inspect the 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 module for repair or for verification of shipping damage.

Shipping Contents

The ADTRAN shipment includes the following items:

- Octal E&M Module
- *Octal E&M Module User Manual*
(Insert into the *ATLAS 550 User Manual*.)

INSTALLING THE OCTAL E&M MODULE

Figure 2-1 shows how to install the module properly. The instructions are described in the Step/Action table, below.

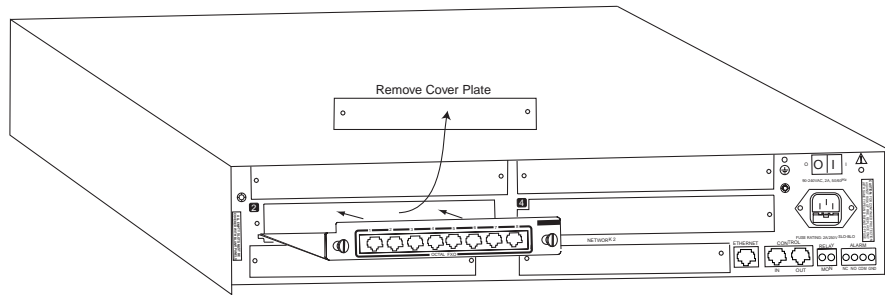


Figure 2-1. Installing the Octal E&M Module

Instructions for Installing the Octal E&M Module	
Step	Action
1	Remove the cover plate from the appropriate option slot in the ATLAS 550 rear panel.
2	Slide the 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. Tighten with a screwdriver.
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 <i>ATLAS 550 User Manual</i> .

WARNING

Option modules are intended to be serviced by qualified service personnel only.

WIRING

Each module port has a single 8-pin modular jack. A suitable mating connector is AMP # 2-383021-5. The Octal E&M module is an E-lead originate signaling circuit suitable for connection to an M-lead originate trunk circuit. The pinout is shown in Table 2-1 and Table 2-2

Table 2-1. Pinout Connection

PIN	Signal	DESCRIPTION
1	Ring	VF input (4W mode, 600Ω nominal)
2	Tip	Tip/Ring (2W mode, 600Ω + 2.1 6uF nominal)
3	E	Customer Originate
4	SG	Signal Ground
5	SB	Signal Battery
6	M	Network Originate
7	Tip 1	VF output (4W mode, 600Ω nominal)
8	Ring 1	

Table 2-2. Trunk Circuit Connections for Various E&M Signaling Types

Signaling Type	Trunk Circuit Connections			
	E	M	SB	SG
Type I	Pin 3	Pin 6	NC	NC
Type II	Pin 3	Pin 6	Pin 4	Pin 5
Type III	Pin 3	Pin 6	Pin 4	Pin 5
Type IV	Pin 3	Pin 6	Pin 4	Use Frame Ground
Type V	Pin 3	Pin 6	NC	NC

POWER-UP AND INITIALIZATION

The Octal E&M Module requires no initialization input during the power-up sequence. Any previously configured setting for the Octal E&M Module is automatically restored upon power-up. See the *ATLAS 550 User Manual* for more information about the power-up sequence.

Operation Alarms

The red ALARM LED (located with the Module LEDs on the front panel) illuminates when an alarm condition is detected.

OVERVIEW

The Octal E&M Module is controlled by the ATLAS 550 Base Unit terminal menu. The terminal menu allows for detailed configuration, status, and testing of the Octal E&M Module.

Configuration of the Octal E&M Module is completed in two areas of the terminal menu:

1. **General** configuration items for the Octal E&M-8 Voice Module are set using **MODULES/E&M-8 MENUS/CONFIG** (see the Menu Tree in Figure 3-2 on page 3-3).
2. **Specific** configuration items depend on how the option module is used and is displayed in the **DIAL PLAN** menus (see Appendix A, *Dial Plan Interface Configuration* on page A-1).

Access the terminal menu using either a VT-100 terminal attached to the ATLAS 550 Base Unit's control port or a Telnet session established through the Base Unit's Ethernet port. The *ATLAS 550 User Manual* provides detailed instructions on 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 550 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

The ATLAS 550 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 Octal E&M Module, activate the **MODULES** menu. The Octal E&M Module displays as **E&M-8** under **TYPE**.



Refer to the *ATLAS 550 User Manual* for detailed instructions on navigating through the terminal menu.

MODULES MENU

The ATLAS 550 system controller automatically detects the presence of the Octal E&M Module when it is installed in the system. To see the menus for the Octal E&M 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 on page 3-3). The following sections describe all the **MODULES** menu options.

ATLAS 550/Modules	Slt	Type	Menu	Alarm	Test	State	Status	Rev
System Info	Slt0	Sys Ctr1	[+]	OK	OFF	ONLINE	Online	B
System Status	Ntw1	T1/PRI-1	[+]	[OK]	[OFF]	ONLINE	Online	B
System Config	Ntw2	EMPTY				ONLINE	Empty	-
System Utility	Slt1	E&M-8	[+]	OK	[OFF]	ONLINE	Online	B
Modules	Rsc1	EMPTY				ONLINE	Empty	-
Packet Manager	Slt2	U3SNx-2	[+]	[OK]	[OFF]	ONLINE	Online	B
Router	Rsc2	EMPTY				ONLINE	Empty	-
Dedicated Maps	Slt3	FXS-8	[+]	OK	[OFF]	ONLINE	Online	B
Dial Plan	Rsc3	EMPTY				ONLINE	Empty	-
	Slt4	U-BRI-4	[+]	[OK]	[OFF]	ONLINE	Online	A
	Rsc4	EMPTY				ONLINE	Empty	-

SYS:ONLN NETWORK1:ONLN NETWORK2: -- 1: OK 2:ONLN 3: OK 4:ONLN
 Module type ^H=more ^Z=help 9:38

Figure 3-1. Modules Menu

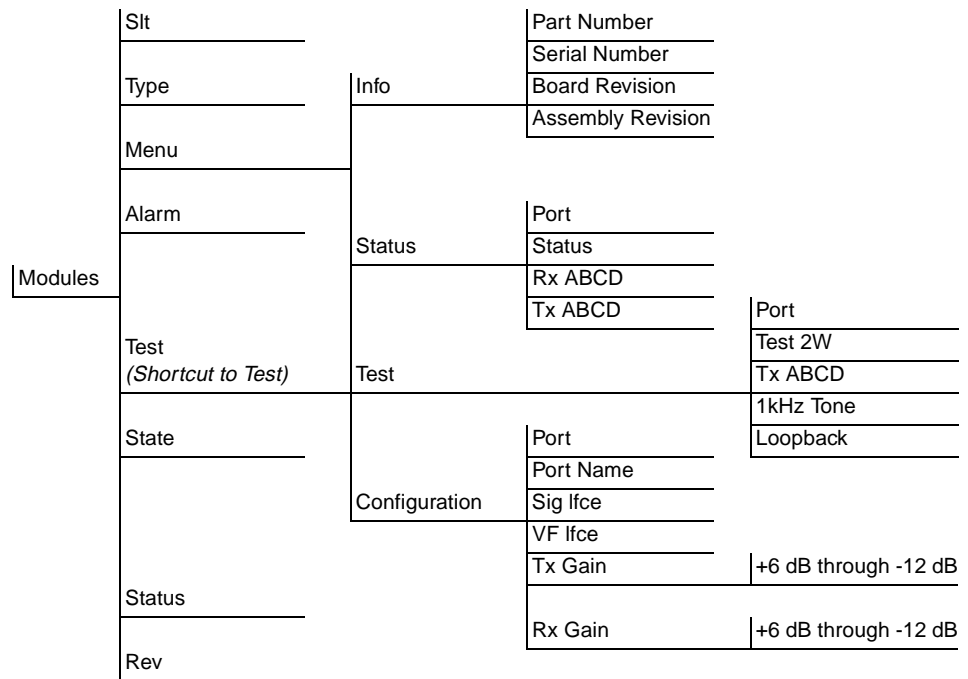


Figure 3-2. Menu Tree for Octal E&M Module Menu

SLT

Read security: 5

Displays the number of available slots in the ATLAS 550 chassis. Slot 0 refers to the ATLAS 550 unit. This field is read-only.

TYPE

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 an Octal E&M Module is installed, the **TYPE** field automatically defaults to **E&M-8**.

You can use this field to preconfigure a system before actually installing modules by simply specifying the module that you want to install in each slot. If you intentionally leave a slot empty, mark it as **EMPTY** to avoid getting a **NOT RESPONDING** message.



NOTE *TYPE* automatically displays the name of an installed module. If you want to preconfigure the slot for a different type of module, you must set this field to **EMPTY** before selecting another module type.

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 detailed information on each submenu item, see the section *Octal E&M Module Menu Options* on page 3-5.

ALARM Read security: 5
Displays an alarm condition on the module. Press **Enter** in this field to activate the menu.

TEST Read security: 5
Displays the test name if the module is executing a test. Press **Enter** in this field to activate the menu. Tests include **TEST 2W, TX ABCD, 1KHZ TONE,** and **LOOPBACK**. See *Test* on page 3-6 for a description of each test and its options.

STATE Displays module status as either **ONLINE** or **OFFLINE**. Even though a module is physically installed, it must be marked as **ONLINE** for it to be considered an available resource. This parameter allows an installed module to be marked as **OFFLINE**, which may be useful in system troubleshooting. If you choose **OFFLINE**, the module will not be in alarm condition, and will display **OFFLINE**.



*Once a module is installed, **STATE** must be set to **ONLINE** for the ATLAS 550 to use the module for any data bandwidth.*

STATUS This read-only field provides status information on the Octal E&M 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.



*The Atlas 550 **ONLINE LED** illuminates green when a call is active on any of the voice parts.*

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.
REV	This read-only field displays the assembly revision of the Octal E&M Module.

OCTAL E&M MODULE MENU OPTIONS

Figure 3-3 shows the menu options available for the Octal E&M Module (see also the menu tree in Figure 3-2 on page 3-3). The following sections describe these options.



Figure 3-3. Octal E&M Module Menu Options

INFO	Provides read-only information about module part number, serial number, assembly revision, and firmware revision.
PART NUMBER	Displays the part number of the module.
SERIAL NUMBER	Displays the serial number of the module.
ASSEMBLY REVISION	Displays the assembly revision.
FIRMWARE REVISION	Displays the firmware revision.

STATUS	Displays the status of each of the eight Octal E&M Module ports.
PORT	Displays the port number.
STATUS	Displays the call status of each voice port. This field may display the following:
INACTIVE	The port is preconfigured, but the E&M module is not present.
DISABLED	The E&M module is present, but the port is not in the DIAL PLAN .

IDLE Trunk not in use.

E-LEAD ASSERTED Far end seizure.

M-LEAD DETECTED Near end seizure.

CALL IN PROGRESS Trunk in use.

TO Transmission Only mode.

TEST E-LEAD OPEN Force on-hook.


TEST E-LEAD CLOSED Force off-hook.

TEST Generic test indicator.

RX & TX ABCD Receive and Transmit Signaling bits have local significance only, and represent E&M signaling between the ATLAS 550 Controller and the voice port. The bit pattern is formatted **ESF RBS**.

TEST Displays the test name if the module is executing a test. Press **Enter** in this field to activate the menu.

TEST 2W Activates 2W (E&M) tests on a per-port basis. Test options include **OFF** (no tests are active), **E-LEAD OPEN** and **E-LEAD CLOSED**. Table 3-1 on page 3-7 displays the state of the 2W conductors during each test.



NOTE *The 2W tests disrupt calls in progress.*

Table 3-1. Test 2W Information

Test	Module Output
Off	E-lead follows the Rx signaling bits
E-lead Open	Force on-hook
E-lead Closed	Force off-hook

Tx ABCD

Forces the Transmit Robbed Bit Signaling (Tx RBS) to a specified value. Values include **OFF**, **0000**, **0101**, **1010**, or **1111**.

**NOTE**

Calls may be affected when activating the Tx ABCD test. This test is not valid when the port is used in the DIAL PLAN.

1KHZ TONE

Sends a 1kHz tone into the following locations, based on test selection: **NEAR** sends the tone out the E&M VF port, while **FAR** sends the tone into the digital PCM stream of the ATLAS 550 controller. These tests are useful for verifying a voice path.

LOOPBACK

Activates Loopback tests on a per-port basis.

Off Normal operation.

Analog Loops the 2W test on itself.

Digital Loops digital data entering the E&M from the ATLAS controller on itself.

Both Processes both Analog and Digital Loopback tests.

**NOTE**

Loopback tests disrupt calls in progress.

CONFIGURATION

Provides menu options for configuring the module.


PORT

Identifies the port.

PORT NAME

Allows the user to assign a meaningful name to the port.

SIG IFCE	Selects signaling interface operation. The module supports all E&M types - I through V, as well as Transmission Only (TO) mode. Press-to-talk (PTT) mode is functionally identical to the E&M Type V mode.
VF IFCE	Selects either 4-wire or 2-wire operation of the Voice Frequency (VF) Interface.
RX GAIN	Adjusts the level of the signal output at the VF interface. The available range is from +6 dB (loudest) to -12 dB (softest).
TX GAIN	Adjusts the encoded level of the signal transmitted by the module in the PCM stream. The available range is from 6+dB (loudest) to -12 dB (softest)


 NOTE <i>When the digital signal is connected through the PSTN, a setting of -3 dB should be used.</i>
--

ATLAS 550 FEATURES USED WITH OCTAL E&M MODULE

Two additional ATLAS 550 menu items can operate in conjunction with the Octal E&M Module: **FACTORY RESTORE** and **RUN SELFTEST**.

FACTORY RESTORE You can restore the factory default settings for the Octal E&M Module by pressing **F** either while the cursor is over the **SLT** number (this action restores the factory settings for all of the module options) or while the cursor is over an individual field (this action restores factory settings for the particular field only).

RUN SELF-TEST **RUN SELFTEST**, a submenu of the ATLAS 550 main menu item **TEST**, executes both the Octal E&M Module internal test and the ATLAS 550 internal test. When **RUN SELFTEST** displays, place the cursor on it and press **Enter** to execute the test. The unit continuously changes the display on the self-test log screen until all test results are shown. For additional information on **RUN SELFTEST**, see the *ATLAS 550 User Manual*.

 CAUTION <i>Unplug the cables from the modular jacks before running a self-test on the E&M Module.</i>
--

INTERFACE CONFIGURATION

The **IFCE CONFIG** option for the **DIAL PLAN** menu (see Figure A-1) sets configuration parameters for the endpoint. These parameters vary by the type of port selected. The **DIAL PLAN** menus are only accessible when using terminal mode. To access these options, select **DIAL PLAN** from the top level menu.

```
ATLAS 550/Dial Plan
System Info      Network Term [+]
System Status    User Term      [+]
System Config    Global Param   [+]
System Utility
Modules
Packet Manager
Router
Dedicated Maps
Dial Plan

SYS:ALARM  NETWORK1:ALARM  NETWORK2:ALARM  1:ALARM  2:ALARM  3:ALARM  4:ALARM
?=help 15:09
```

Figure A-1. Dial Plan Menus

OCTAL E&M MODULE INTERFACE CONFIGURATION

The following sections describe **USER TERM** configuration settings for the Octal E&M Module when using the **DIAL PLAN** menus.

PORTS AVAILABLE

Read security: 5

Shows port allocation for the endpoint. The characters used to define the allocation have the following meanings:

- 0-9** Describes available ports, as indicated by the displayed digit. This digit is the last digit of the port number.
- !** The endpoint uses this port.
- s** The switched dial plan uses this port elsewhere.
- S** The switched dial plan uses this port elsewhere and a conflict exists with this endpoint.
- n** One or more dedicated (nailed) maps use this port.
- N** One or more dedicated (nailed) maps use this port and a conflict exists with this endpoint.
- Indicates that this is the wrong kind of port for this endpoint.

NUMBER OF PORTS

Write security: 2; Read security: 5

Defines the number of ports that could be used to answer calls to the numbers defined in the **ACCEPT CALL** list. The ports are contiguous beginning with the port number selected and the number of ports.

SIGNALING METHOD

Defines the type of signaling to be used across this analog interface. The signaling selected needs to match the supervision of the corrected trunk. Options include **E&M IMMEDIATE** and **E&M WINK**.

DIRECT INWARD DIALING

Write security: 3; Read security: 5

Defines whether the end-user equipment requires digits to be delivered after going off-hook.

CALLER ID NUMBER

Assigns a calling party number to a port when it originates a call and the call exits an ISDN interface.

DID DIGITS TRANSFERRED

Defines the number of digits sent to the end-user equipment. This field displays only if **DIRECT INWARD DIALING** is set to **ENABLED**.

STRIP MSD

Write security: 3; Read security: 5

Strips a selected quantity (choose from **NONE**, **1**, **2**, and **3**) of the Most Significant Digits (MSD) of a dialed number prior to being forwarded out of the port.

EXAMPLE:

A network port could be set to accept all calls beginning with 9 (9\$), and then with **STRIP MSD** set to 1, all digits would be sent toward the network except the leading 9.

**NOTE**

STRIP MSD does not affect **CALL ACCEPT** criteria. All of the digits (including the MSDs that are subsequently stripped) are used as accept criteria.

SOURCE ID

Write security: 3; Read security: 5

Simplifies the creation of a **DIAL PLAN** in applications where the criterion for switching calls to a certain endpoint is a function of which endpoint originated the call.

- Default value = 0. The default ID for all endpoints is 0 and all accept numbers is 0. With default values, all calls are routed based only on the dialed number.
- Multiple endpoints can have the same **SOURCE ID**.
- When creating the **CALL ACCEPT** list, specify one or more **SOURCE IDs** as well as a dialed number or range of dialed numbers to accept.

EXAMPLE:

An application requires that all calls that originate from Port 1 of the module in Slot 1 be switched to Port 2 of that same module. Assign a unique Source ID (e.g., 7) to Port 1 of the module, and then configure Port 2 to only accept calls from that unique Source ID (7).

DIAL ON OFFHOOK

Write security: 3; Read security: 5

Defines a number that is automatically sent to the switchboard when a call on this port goes offhook.

**NOTE**

The **DIAL ON OFFHOOK** 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 Customer and Product Service (CAPS) department to issue an RMA number. For information regarding equipment currently in house or possible fees associated with repair, contact CAPS directly at the following number:

CAPS Department (256) 963-8722

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

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

RMA # _____

