



Quad FXS Voice Module User Manual

Part Number 1175408L1



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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.

Canadian Emissions Requirements

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Class A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par le Ministre des Communications.

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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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ADTRAN warrants that for five (5) years from the date of shipment to Customer, all products manufactured by ADTRAN will be free from defects in materials and workmanship. ADTRAN also warrants that products will conform to the applicable specifications and drawings for such products, as contained in the Product Manual or in ADTRAN's internal specifications and drawings for such products (which may or may not be reflected in the Product Manual). This warranty only applies if Customer gives ADTRAN written notice of defects during the warranty period. Upon such notice, ADTRAN will, at its option, either repair or replace the defective item. If ADTRAN is unable, in a reasonable time, to repair or replace any equipment to a condition as warranted, Customer is entitled to a full refund of the purchase price upon return of the equipment to ADTRAN. This warranty applies only to the original purchaser and is not transferable without ADTRAN's express written permission. This warranty becomes null and void if Customer modifies or alters the equipment in any way, other than as specifically authorized by ADTRAN.

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QUAD FXS VOICE MODULE OVERVIEW

The Quad FXS Voice Module (see Figure 1-1) is for use in the Total Access 750/850/1500 (TA 750/850/1500) platforms to provide analog voice extension. The Quad FXS resides in the TA chassis that is next to or close to the customer's telephone and is usually located on the customer's premises. This unit can be used in conjunction with the TA 750/850/1500 FXO Voice Module, which resides in the TA 750/850/1500 that is located next to the Central Office switch.

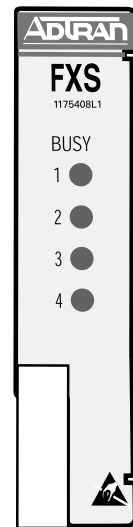


Figure 1-1. Quad FXS Voice Module

If TR-08 signaling format is not readily available at the CO switch, both FXO and FXS access modules can be used for deployment. The TA 850 at the CO will combine a number of analog lines and then multiplex them for T1 transmission to the TA 850 at the customer premise. If using the TR-08 signaling option, the Quad FXS can communicate directly with the Central Office Switch without needing a Quad FXO.

Functional Description

The Quad FXS Voice Module installs in any available option slot in the TA 850 chassis. You can view the status of the module itself, as well as the circuits to which it interfaces, from the TA 850 front panel. Additional status information is available via the terminal menus, accessible through either a VT-100 terminal connected to the TA 850 control port or via a Telnet session established through the Base Unit's Ethernet port.

Features

Features of the Quad FXS Voice Module are listed here:

- Four voice ports
- Automatic short loop provisioning
- μ -law encoding and decoding
- Support for ground start, loop start, and TR-08 signaling
- Long loop capability -- 1200 ohms including telephone set (16 kfeet @ 24 AWG)
- Hot-swappable
- V.90 Modem compliant
- Support for CLASS™ features such as Caller ID
- Transmit attenuation setting of 0 to -9 dB
- Receive attenuation setting of 0 to -9 dB
- Selectable 600 ohm, 900 ohm, 600 ohm + 2.16 μ F, or 900 ohm + 2.16 μ F 2-wire VF interface
- NEBS Level 3 and UL 1950 compliant
- Extended temperature range of -40 to +65 °C

QUAD FXS VOICE MODULE SPECIFICATIONS

ELECTRICAL SPECIFICATIONS	
Power	6 Watts (off hook)
Loop Current	23 mA nominal 20 mA minimum
Loop Resistance	1200 ohms nominal/1650 ohms maximum* (900 ohms/1350 ohms - line, 300 ohms - phone)
Loop Length	16 kfeet
Terminating Impedance	900 ohm + 2.16 μ F, 600 ohm + 2.16 μ F, 900 ohm, and 600 ohm
Return Loss	900 ohm + 2.16 μ F, ERL > 28 dB, SRL > 20 dB
Trans Hybrid Loss	900 ohm + 2.16 μ F, ERL > 28 dB, SRL > 20 dB
Longitudinal Balance	200, 500, and 1000 Hz: > 58 dB min., > 63 dB avg. 3000 Hz: > 53 dB min., > 58 dB avg.
Frequency Response	300 to 3400 Hz: -0.5 and 1.0 dB
Idle Channel Noise	< 20 dB _{BrnC}
Signal-to-Distortion Ratio	0 to -30 dBm ₀ : > 33 dB -30 to -40 dBm ₀ : > 27 dB -40 to -45 dBm ₀ : > 22 dB
PHYSICAL SPECIFICATIONS	
Dimensions	3 1/4" H x 10" D
Weight	1 lb.
ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature	-40 to 64 °C
Storage Temperature	-40 to 70 °C
Relative Humidity	Up to 95% noncondensing
*Measured with -48 VDC input, 20 mA loop current	

BEFORE INSTALLING THE QUAD FXS VOICE MODULE

Carefully unpack and inspect the Quad FXS Voice 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 FXS Voice Module for repair or for verification of shipping damage.

Shipping Contents

The ADTRAN shipment includes the following items:

- Quad FXS Voice Module
- Quad FXS Voice Module *User Manual*
(Insert into the *TA 850 User Manual*.)

INSTALLING THE QUAD FXS VOICE MODULE

The following Step/Action table describes the actions required to install the Quad FXS Voice Module.

Instructions for Installing the Quad FXS Voice Module	
Step	Action
1	Hold the Quad FXS Module by the faceplate while supporting the bottom side.
2	Align the module edges to the guide grooves for the designated slot.
3	Insert the module until the edge connector seats firmly into the backplane.
4	Lock the unit in place by pushing in on the locking lever.

Instructions for Installing the Quad FXS Voice Module (Continued)	
Step	Action
5	Connect the cables to the associated device(s).
6	Complete installation of remaining modules and Base Unit as specified in the Installation chapter of the TA 850 User Manual.

WIRING

A single 50-pin male amphenol connector on the rear of the TA 850 chassis provides the interconnect wiring for the four analog circuits on each access module. Figure 2-1 shows the pinout connection.

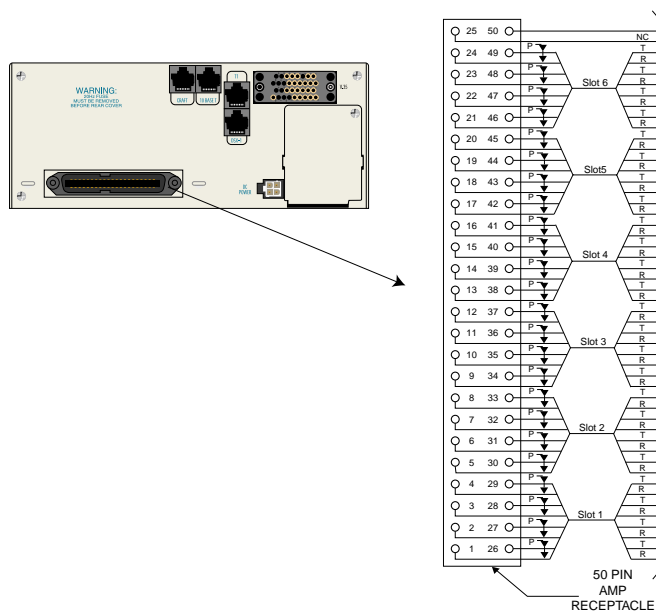


Figure 2-1. Connector Pin Assignments

OVERVIEW

The Quad FXS Voice Module goes operational upon insertion into an active TA 750/850/1500 chassis. Once the unit is inserted, it must be mapped to a network interface for proper operation. Refer to the *TA 850 User Manual* Channel Bank chapter (DS0 mapping section) for information.

LED Status

After the initialization sequence, faceplate LEDs show the status of the analog service for each customer loop, as follows:

Off	On Hook
Flashing	Ringing
On	Off Hook (Busy)

TESTING

Self-Test

A self-test is performed on the Quad FXS Voice Module when it is inserted into an active TA 850 chassis. The test verifies proper operation of critical circuits. If the test is successful, all four LEDs turn on in a predefined sequence, the unit is placed in service, and the LEDs then return to normal operation showing current status of the FXS.

Initiated Tests

Other tests conducted on the Quad FXS Voice Module are initiated via the screen menus and VT 100 terminal. (See *Quad FXS Voice Module Test Options* on page 3-5 for more information.)

METHODS OF OPERATION

You can control and configure the Quad FXS Voice Module from the following sources:

- The terminal menus, allowing detailed configuration, status, and diagnostics
- SNMP, primarily for reporting alarm conditions and system status

The remainder of this chapter describes the menu items presented when managing the Quad FXS Voice Module via the terminal menu.

Access the terminal menu using either a VT-100 terminal attached to the TA 850 Base Unit's control port or a Telnet session established through the Base Unit's Ethernet port. The *TA 850 User Manual* provides detailed instructions on the operation of each of these management approaches.

The factory default password is **PASSWORD**. It can be changed to a user-specified password.

TERMINAL MENU STRUCTURE

The TA 850 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 FXS Voice Module, activate the **MODULES** menu.



*Refer to the **TA 850 User Manual** for detailed instructions on navigating through the terminal menu.*

From the **MODULES** menu, select the **QUAD FXS** menu, and then press **Enter** to access the features of the Quad FXS card.

QUAD FXS VOICE MODULE MENU OPTIONS

Figure 3-1 shows the menu options available for the Quad FXS Voice Module. The following sections describe these options.

TA 850 ACU/Channel Bank/Modules[1]/Provisioning							
Provisioning	Port	Mode	Tx (dB)	Rx (dB)	Src Mode	Line Z	
Test Status	1	Loop Start	6.0	3.0	In Service	600 Ohms	
	2	Loop Start	6.0	3.0	In Service	600 Ohms	
	3	Loop Start	6.0	3.0	In Service	600 Ohms	
	4	Loop Start	6.0	3.0	In Service	600 Ohms	
MODE: Channelbank SLOTS 1:FXS 2:FXO 3: 4: 5: 6: NET: up							
FXS Configuration Menu						^Z=help 21:20	

Figure 3-1. Quad FXS Voice Module Menu Options

PRT Identifies the port involved.

MODE Options are given below.

LOOP START Sets the port to use FXS loop start signalling on the T-span and loop start supervision on the analog 2-wire interface.

GROUND START Sets the port to use FXS ground start signalling on the T-span and ground start supervision on the analog 2-wire interface.

TR08 SINGLE Sets the port to use Single Party Channel Unit signalling on the T-span (as defined by TR-TSY-000008) and loop start supervision on the analog 2-wire interface.

TR08 UVG Sets the port to use UniversalVoice Grade signalling on the T-span (as defined by TR-TSY-000008) and either loop start or ground start supervision on the analog 2-wire interface.

DPO Sets the port to use Dial Pulse signalling to originate dialed numbers.

TANDEM (E&M) Sets the port to use E&M signalling on the T-span and either loop start or ground start supervision on the analog 2-wire interface. See the Tandem sub-menus for more information.

TX (dB)	Sets the Tx direction transmit level points. The transmission level is indicated in dBm. Range is from 0 to 9.9 dBm. Default is 6.0.
RX (dB)	Sets the Rx direction transmit level points. The transmission level is indicated in dBm. Range is from 0 to 9.9 dBm. Default is 3.0.
SVC MODE	Indicates whether the module is IN SERVICE or OUT OF SVC . This does not indicate whether the port has been mapped. For proper operation, the port must be mapped using the DS0 MAPS menu.
LINE Z	Sets the line impedance. Choices are 600 OHMS , 900 OHMS , 600 OHMS + 2.16μF , 900 OHMS + 2.16 μF , and AUTO .
TANDEM	Displays additional Tandem information about the module when it is used in Tandem (E&M) mode. (To access submenus for this item, use the arrow keys to scroll to the TANDEM column for the module you want to edit, and then press Enter .)
CONVERSION MODE	Sets the port to either loop start or ground start mode.
SUPERVISION	Sets the supervision method used to either IMMEDIATE or WINK .
DIAL TONE	Used to enable or disable the on-board dial tone generation.
RING BACK TONE	Used to enable or disable the option of generating ring back tone towards the T-span.
ANSWER SUPERVISION	Causes the polarity of tip and ring to be reversed when the far-end answers. Can be enabled or disable.
DNIS OPTIONS	Enable/disable.
DNIS DELAY	Sets the amount of time the FXS will wait after sending a wink before sending answer supervision toward the CO.

QUAD FXS VOICE MODULE TEST OPTIONS

PRT	Identifies the port involved.
TEST	To initiate a module test, scroll to the TEST column and press Enter . Options are detailed below.
DIGITAL LOOPBACK TEST	The Digital Loopback Test is used to loop back DS0 data coming from the network for each channel. Received data is latched In on the appropriate receive time slot on the receive bus. This data is then placed on the transmit bus in the unit's transmit time slot.
NETWORK ON-HOOK/OFF-HOOK TEST	The Network On-Hook/Off-Hook Test is used to test signalling sent to the network by the unit. When On-Hook Test is selected, On-Hook signalling is sent to the network. When Off-Hook Test is selected, Off-Hook signalling is sent to the network. The customer loop is forced On-Hook while this test is active.
1004 HZ - 0DBM0 TONE GENERATION TEST	The 1004 Hz - 0dbm0 Tone Generation Test is used to send DRS signal on the receive path to the loop. The loop receive level that should be received is determined by the following equation: Receive Level = 0 dB - Attenuation
CUSTOMER RING TEST	The Customer Ring Test will activate the unit's ring relay in a 2-on/4-off ring cadence, providing ringing to the customer loop.
TEST STATUS	Tells whether a test is in progress.

QUAD FXS VOICE MODULE STATUS OPTIONS

The transmit and receive signalling bits are shown in the **STATUS** menu of the Quad FXS module.

TA 850 FEATURES USED WITH QUAD FXS VOICE MODULE OPTIONS

Two additional TA 850 menu items can operate in conjunction with the Quad FXS Voice Module: **FACTORY RESTORE** and **RUN SELFTEST**.

Factory Restore

You can restore the factory default settings for a Quad FXS Voice Module by pressing **F** while the cursor is over the **SLT** number (this action restores the

factory settings for all of the module options), while the cursor is over the **PRT** number (this action restores the factory settings for the port), or while the cursor is over an individual field (this action restores factory settings for the particular field only).

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Product Support Information

Presales Inquiries and Applications Support

Please contact your local distributor, ADTRAN Applications Engineering, or ADTRAN Sales:

Applications Engineering (800) 615-1176

Sales (800) 827-0807

Post-Sale Support

Please contact your 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 # _____

