Total Access™ 750/850/1500
QUAD FXO Access Module
Installation and Maintenance

CONTENTS

FIGURES

TABLES

1. GENERAL

This practice provides installation and maintenance procedures for the ADTRAN Total Access 750/850/1500 Quad Foreign Exchange Office Access Module. **Figure 1** is an illustration of the Quad FXO. The unit is multifunctional and can be provisioned to operate in one the following modes:

- 2-Wire Foreign Exchange Office (2FXO)
- Dial Pulse Terminate (DPT)

Revision History

This document has been revised to change PASSWORD information.

Features

The features of the TA 750/850/1500 Quad FXO, part number 1175407L1, include the following:

- Provides four individual analog voice interfaces.
- μ-law encoding/decoding.
- Supports ground start and loop start signaling (FXO mode).
- Nominal 900 Ω + 2.15 μF 2-wire voice frequency (VF) interface with DC isolation.
- Provides loop reverse battery signaling for DID PBX extensions (DPT mode).

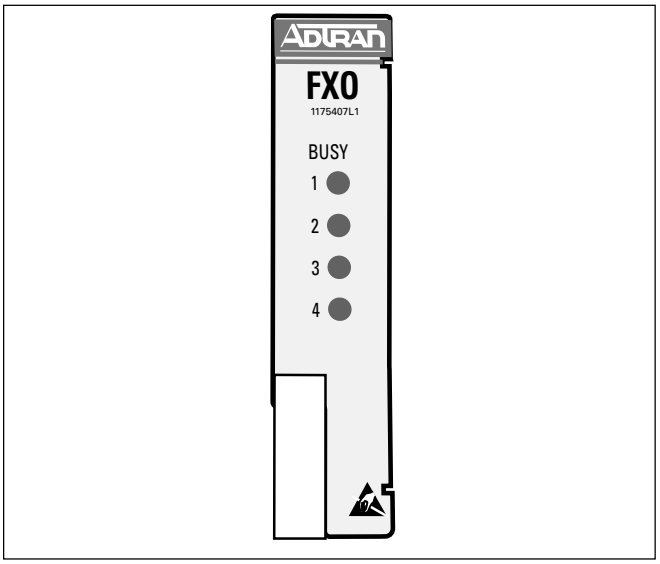

Figure 1. TA 750/850/1500 Quad FXO

- Transmit and receive attentuation settings of 0 to -9 dB in 0.1 dB increments.
- Compliant with Voice Frequency characteristics and signaling of Telcordia® TR-NWT-000057.
- Supports Calling Number Delivery and other common (CLASS™) service offerings according to TR TSY 000030 section 3.3.1.1.
- Extended temperature range: -40º to 65º C.
- UL 1950 compliant.

General Description

The Quad FXO access module provides the interface between a TA 750/850/1500 Pulse Code Modulation (PCM) backplane, and a 2-wire voice frequency (VF) transmission and signaling facility. The unit normally resides at the central office and is designed for use in conjunction with the TA 750/850/1500 Quad FXS which resides at the customer premises.

Figure 2 shows a typical deployment using both Quad FXO and Quad FXS access modules. The TA 750/850/1500 at the CO combines a number of voice frequency analog lines then multiplexes them for T1 transmission to the remote TA 750/850/1500 at the customer premises. The remote multiplexer separates the T1 transmission to individual analog signals for delivery to the appropriate Quad FXS.

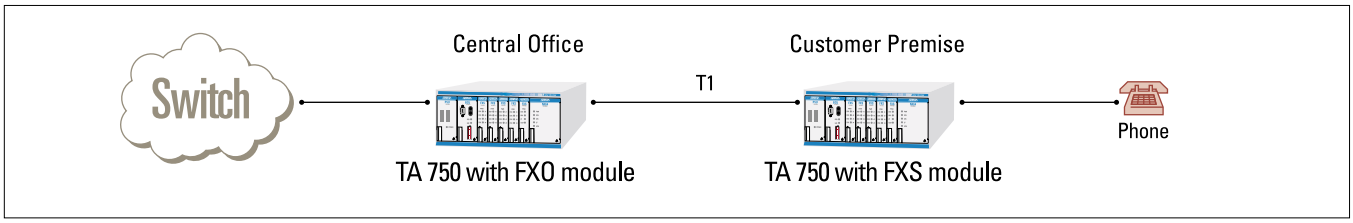

Figure 2. FXO to FXS Deployment

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may cause harmful interference, and (2) this device must accept any interference that may cause undesired operation.

Changes or modifications not made expressly by ADTRAN could void the user's authority to operate this equipment.

2. INSTALLATION

CAUTION!
SUBJECT TO ELECTROSTATIC DAMAGE OR DECREASE IN RELIABILITY.
HANDLING PRECAUTIONS REQUIRED.

After unpacking the unit, inspect it for damage. If damage is noted, file a claim with the carrier, then contact ADTRAN Customer Service.

The Quad FXO inserts into any slot, even or odd 1 through 6, of the TA 750, TA 850 or TA 1500 chassis.

To install the Quad FXO, hold the unit by the faceplate while supporting the bottom side. Align the card edges to the guide grooves for the designated slot. Insert the card until the edge connector seats firmly into the backplane. Lock the unit in place by pushing in on the locking lever.

Telecommunications Codes

The table below shows the Telecommunications Codes for the Total Access 750/850/1500 QUAD FXS Access Module. The Total Access 750/850/1500 QUAD FXS Access Module is intended to be installed in restricted access locations only (must be installed in TA 750/850/1500 only) and in equipment with a Type 'B' or 'E' installation code.

Code	Input	Output
IC	A	–
TC	–	X
PC	C	C

3. OPTIONS

There are no hardware options on the Quad FXO access module. The module has factory default settings for each of the four analog interfaces on the module. The DB-9 VT 100 craft interface on the TA 750 BCU, TA 850 RCU or TA 1500 SCU is used if any other settings or provisioning options are desired. The factory default setting for the QUAD FXO interfaces are as follows:

- FXO Mode.
- Loop start signaling.

Setting Attenuation With Known TLP

For applications where input and output Transmit Level Points are known, the transmit and receive attentuation levels can be calculated to ensure optimum VF characteristics. This is defined in AT&T® Publication 43801 which explains that the value of the digital signal at reference point TLP0 should be equal to 0 dBm0, or a digital milliwatt for optimum performance (proper volume heard through the telephone). Refer to **Figure 3** which displays the TLP reference points (input, output, TLP0) and attenuation parameters.

TRANSMIT ATTENUATION

Determine the input TLP. Then use the following formula to calculate the amount of transmit attenuation to add to the circuit:

Tx Attenuation = Input TLP

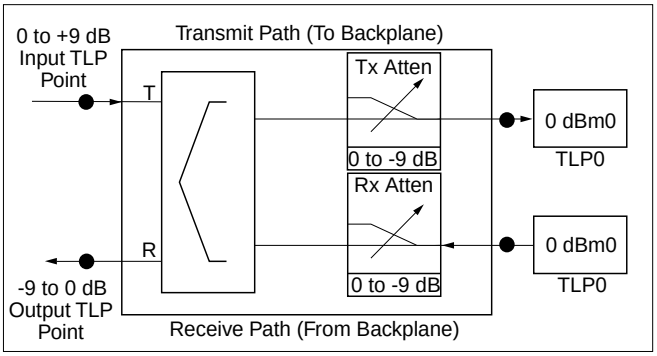

Figure 3. Circuit Path

Example: if an input TLP of 3 dB is to produce a level of 0 dBm0 at TLP 0, then the Transmit Attenuation should be set to 3.0 dB.

RECEIVE ATTENUATION

Determine the output TLP. Then use the following formula to calculate the amount of receive attenuation to add to the circuit:

Rx Attenuation = Output TLP

Example: if 0 dBm0 at TLP 0 is required to produce an output TLP level of -3 dB, then the Receive Attenuation should be set to 3 dB.

Electronic Provisioning

The craft interfaces on the TA 750 BCU, TA 850 RCU, or the TA 1500 SCU are used to change default options and obtain access module status through menu screens. To access the menu screens, connect a VT 100 terminal or computer running a terminal emulation program to the faceplate craft interface ADMIN port using a standard male-to-female RS-232 DB-9 cable. Craft port settings are as follows:

- 9600 Baud
- No parity
- 8 Data bits
- 1 Stop bit

WINDOWS HYPERTERMINAL

Windows Hyperterminal can be used as a VT 100 terminal emulation program. Open Hyperterminal by selecting PROGRAMS / ACCESSORIES / HYPERTERMINAL. Refer to the Help section of Hyperterminal for additional information.

NOTE

To ensure proper display background, select VT 100 terminal emulation under SETTINGS.

PASSWORD

Upon initial connection, the password option is factory disabled. To enable the password, select Bank Controller (1)/ Password Control (8)/ Enable Password (2). The factory default is PASSWORD in all capital letters. The password can be changed to a user-selected password if desired.

MENU NAVIGATION

To traverse through the menus, select the desired entry and press ENTER. To work backwards in the menu press the ESC (escape) key.

4. OPERATION

The Quad FXO initializes and goes operational upon insertion into an active TA 750/850/1500 chassis. Initialization with the network is indicated by the faceplate LEDs.

LED Status

Status of the analog service for each customer loop is shown by four (green) faceplate LEDs. Indication is as follows:

Off	-	On Hook
Flashing	-	Ringing
On	-	Off Hook (Busy)
Sequencing	-	Time Slot Unavailable

NOTE

If the unit is inserted into a bank which has its time slots allocated to the module assigned to the DSX-1 or Nx56/64 port, the LEDs will sequence, indicating a problem. The time slots must be freed up before the unit will become operational.

Time Slot Assignment

The TA 750/850/1500 platforms can have multiple time slots in the T1 data stream assigned to each physical slot in the channel bank. **Table 1** outlines the correlation between the T1 and physical slot for the TA 750. The TA 1500 allows craft selectable time slots using the electronic provisioning interface.

Table 1. TA 750 Time Slot Assignments

Physical Slot	T1 Time Slot Assigned
1	1 - 4
2	5 - 8
3	9 - 12
4	13 - 16
5	17 - 20
6	21 - 24

Connections

TA 750/850

A single 50-pin male amphenol connector on the rear of the TA 750/850 chassis provides the interconnect wiring for the four analog circuits on each access module. **Figure 4** details the pinout of the connector.

TA 1500

Four 50-pin male amphenol connectors on the rear of the TA 1500 chassis provide the interconnect wiring for the four analog circuits on each access module.

5. TESTING

A self test is performed on the FXO when inserted into an active TA 750/TA 850 or TA 1500 chassis. The test verifies proper operation of FXO circuitry. 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 FXO.

Initiated Tests

Tests conducted on the Quad FXO are initiated via the screen menus and VT 100 terminal.

DIGITAL LOOPBACK TEST

The Digital Loopback Test is used to loopback DS0 data coming from the network for each individual 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 signaling sent to the network by the unit. When On-hook Test is selected, On-hook signaling is sent to the network. When Off-hook Test is selected, Off-hook signaling is sent to the Network. The customer loop is forced On-hook while this test is active.

1000 Hz DRS TONE GENERATION TEST

The 1000 Hz DRS (Digital Reference Signal) Tone Generation Test is used to send DRS signal on the receive path to the loop. The loop receive level is determined by the following equation:

Receive Level = 0 dB - Attenuation

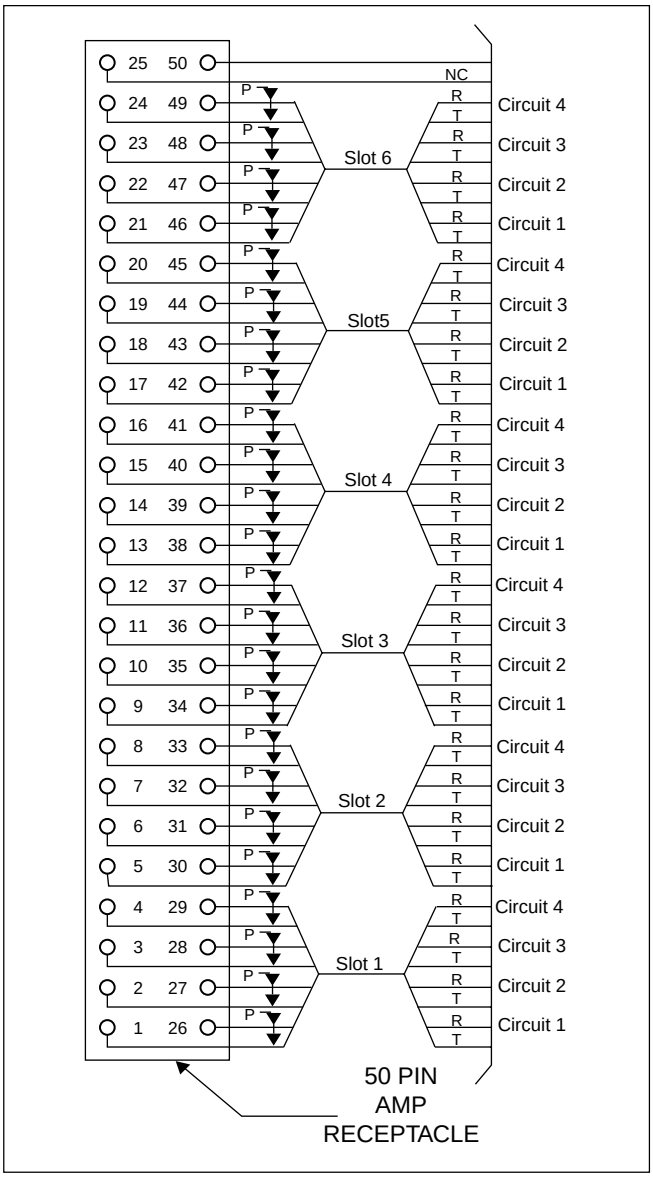

Figure 4. Connector Pin Assignments

6. SPECIFICATIONS

Refer to **Table 2** for TA 750/850/1500 Quad FXO specifications.

Table 2. Specifications

Quad FXO Electrical	
Power:	2 Watts
Terminating Impedance:	900 ohms + 2.16µF
Return Loss:	ERL >28 dB SRL >20 dB
Trans Hybrid Loss:	ERL >28 dB SRL >20 dB
Longitudinal Balance:	200, 500, and 1000 Hz: >58 dB min., > 63 dB ave 3000 Hz: >53 dB min., >58 dB ave
Frequency Response:	300 to 3400 Hz: -0.5 and 1.0 dB
Idle Channel Noise:	<20 dBrnC
Signal-to-Distortion Ratio:	0 to -30 dBm0: >33 dB -30 to -40 dBm0: >27 dB -40 to -45 dBm0: >22 dB
Physical	
Dimensions:	3 1/4" H x 10" D
Weight:	1 lb
Environment	
Operating Temperature:	-40º to 65º C
Storage Temperature:	-40º to 70º C
Relative Humidity:	Up to 95% non-condensing

7. MAINTENANCE

The TA 750/850/1500 Quad FXO does not require routine maintenance for normal operation.

ADTRAN does not recommend that repairs be attempted in the field. Repair services are obtained by returning the defective unit to ADTRAN Customer Service.

8. WARRANTY AND CUSTOMER SERVICE

ADTRAN will replace or repair this product within 10 years from the date of shipment if it does not meet its published specifications or fails while in service (see: *ADTRAN Carrier Networks Equipment Warranty, Repair, and Return Policy and Procedure,* document: 60000087-10A).

Contact Customer And Product Service (CAPS) prior to returning equipment to ADTRAN.

For service, CAPS requests, or further information, contact one of the following numbers:

ADTRAN Sales

Pricing and availability
(800) 827-0807

ADTRAN Technical Support

Presales Applications / Post-sale Technical Assistance
(888) 4 -ADTRAN

Standard support hours:
Monday-Friday, 7 a.m. - 7 p.m. CST

Emergency support: 7 days/week, 24 hours/day

ADTRAN Repair/CAPS

Return for repair / upgrade
(256) 963-8722

Repair and Return Address:

ADTRAN, Inc.
CAPS
901 Explorer Boulevard
Huntsville, Alabama 35806-2807