

# QUICK INSTALLATION OF UMAP1100

## 1. General

### Equipment Purpose and Location

The UMAP1100 shelf is intended for installation in a variety of locations. It is not required that it be installed in a restricted access location or in a controlled environment. An equipped UMAP1100 shelf is comprised for the following units; the shelf, up to 2 network interface units and up to 3 channel units.

## 2. Site Requirements

The UMAP1100 shelf mounts in a standard 19- or 23-inch rack and occupies 1.75 inches of vertical rack space (1 rack mounting space). The shelf may also be wall mounted or placed on a smooth, flat surface. One shelf has positions for 1 or 2 network interface units and 1-3 channel units. Each unit has connectors on the front or rear to allow connection to upstream or downstream services.

### Power Requirements

The shelf is locally powered with -48VDC battery and ground connections. Current draw depends on the type and number of units installed. Recommended fuse is 2 Amps.

### Tool Requirements

The following tools are required for mounting the UMAP1100 shelf:

- For use on the mounting bracket and to secure the channel units in the shelf.
- A fastening tool for whatever rack fasteners are used.
- Wire cutting and stripping tools for power wiring.
- Test gear for checking voltages.

### Rack Requirements

- A standard 19- or 23-inch rack (channel or unequal flange duct).
- Primary protection should be provided for any exposed lines.
- Power from a fused battery distribution panel.
- Sufficient space provided both in front of and behind the shelf to allow free access to the equipment.

## 3. Shelf Installation

After the site requirements have been verified, the shelf may be installed at the specified location.

Step	Action
1.	Locate the shelf and obtain the appropriate shelf mounting hardware.
2.	Determine and obtain the tools required for the shelf mounting hardware.

**NOTE:** The shelf should be empty during the shelf mounting procedures. If any units are in the shelf, remove and store them in accordance with static-sensitive device storage procedure.



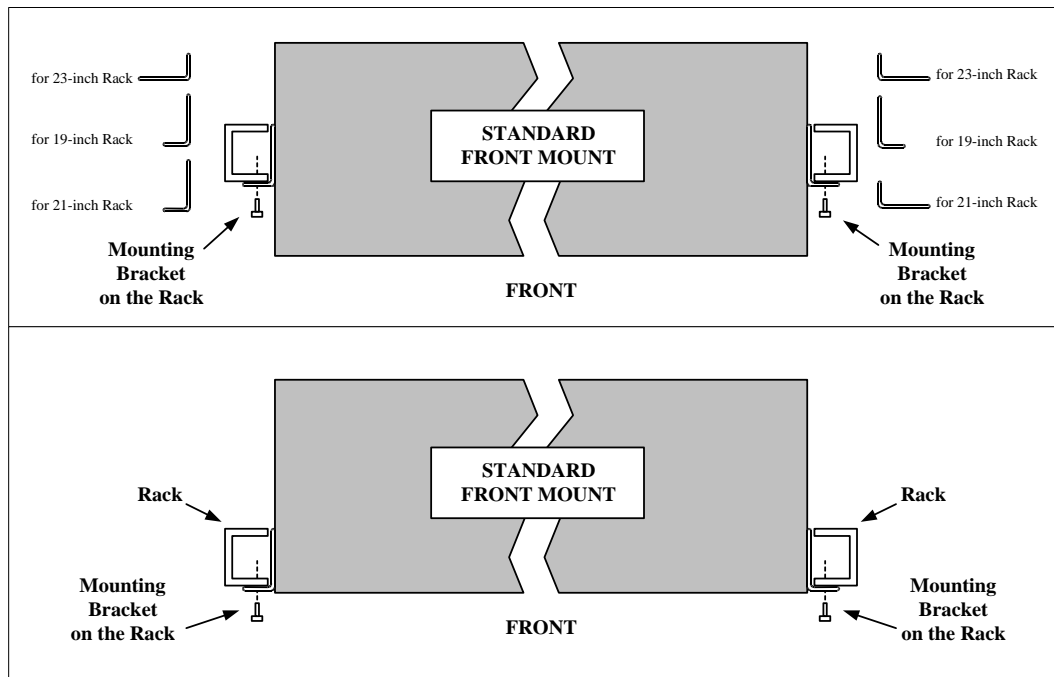
**CAUTION:** Hazardous voltages may exist on the shelf. Always exercise caution when wiring a live circuit or when performing maintenance.

### 3.1 Mounting the Brackets on the Shelf

The position and orientation of the shelf mounting brackets depends on the type of rack used for shelf mounting. The shelf may be front mounted in a standard channel rack (5-inch projection). The shelf may be shipped with the mounting brackets installed in one of three mounting positions or shipped loose (see Figure 1).

The mounting brackets can be rotated for use in wall mounting.

Optional adhesive feet may be attached to the button of the shelf so that it may be placed on a desk or other smooth surface.

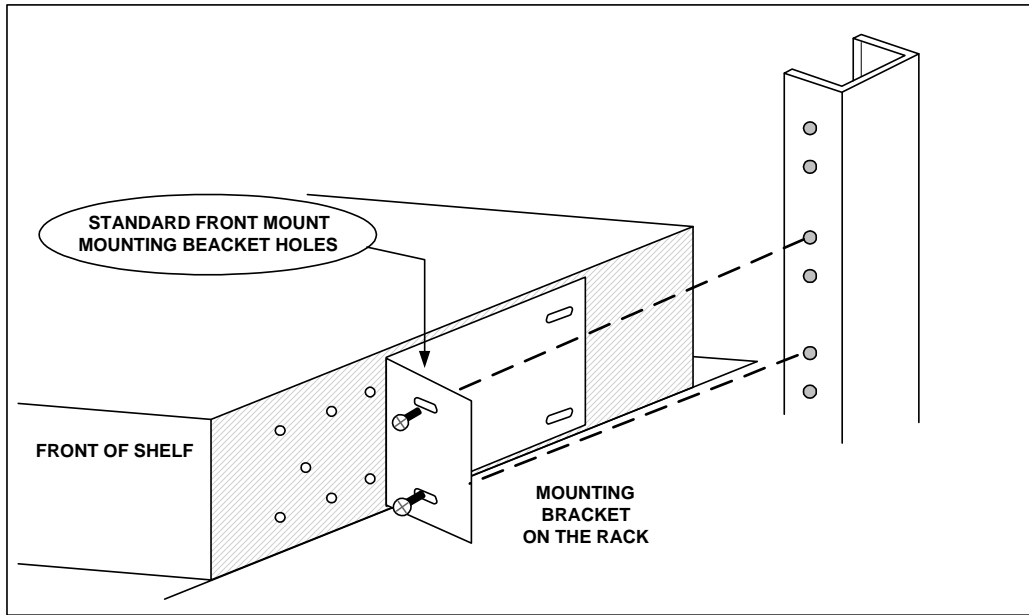


**Figure 1. Mounting Bracket Orientation (Top View)**

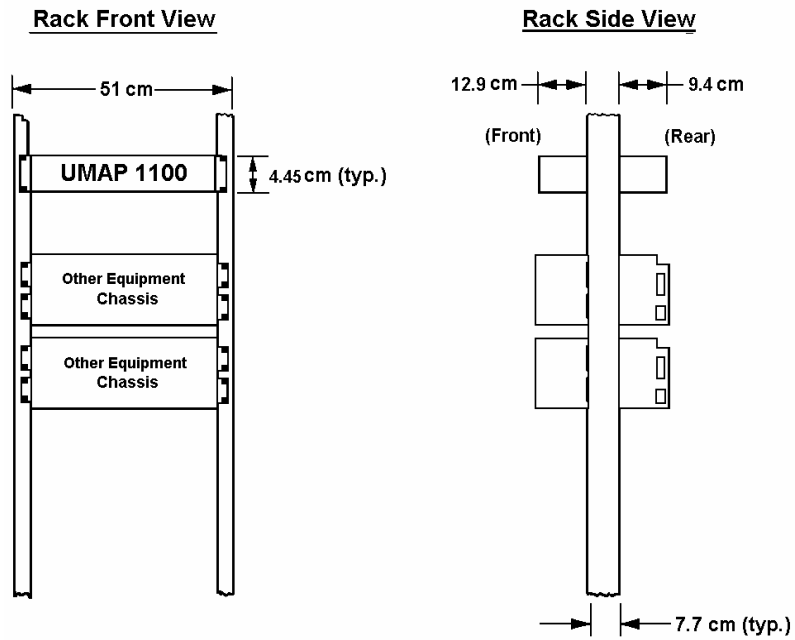
If the shelf mounting brackets are shipped loose or need to be reinstalled use the following procedures.

### 3.2 Rack mounting

Step	Action
1.	From the front of the rack, position the shelf in its rack mounting location (NO TAG).
2.	Secure the shelf in its location using the appropriate rack mounting hardware in the left and right mounting bracket. (Figure 2.)



**Figure 2. Shelf Mounting Bracket Position for Standard Mount**



### 3.3 Wall Mounting

Vertical installation (walls, specially build structures, etc.) requires strict adherence to the mounting instructions to assure trouble free operation and to protect the safety of personnel.

The shelf should be mounted at a height that will permit convenient access for performing maintenance.

The shelf will be mounted with one bracket above the other. The front of the shelf can face either to the right or the left. This will provide front panel access on one side of the shelf and rear panel access on the other side. If the shelf can not be mounted to a wall stud a plywood mounting board is required.

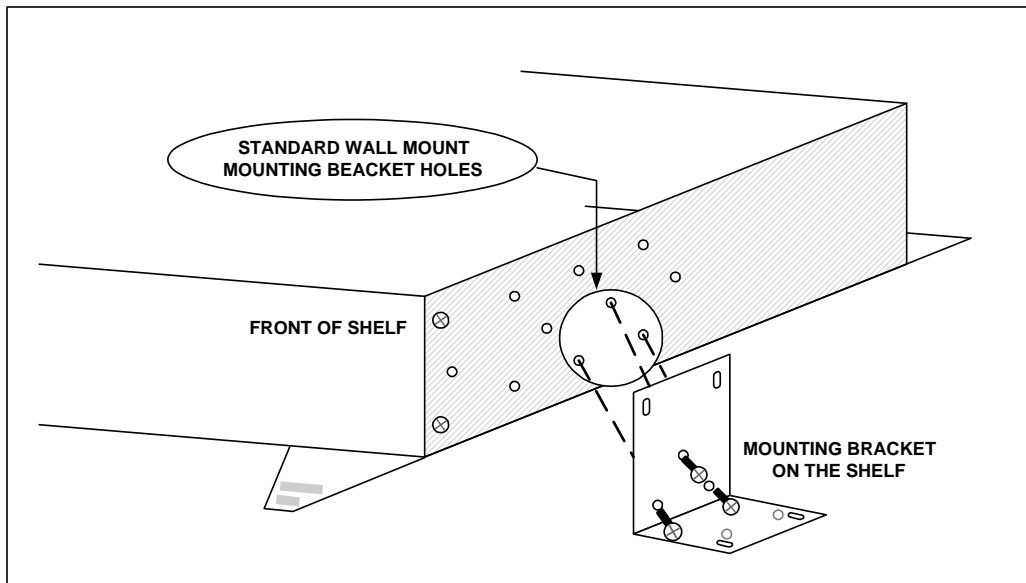



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**CAUTION:** *If using a plywood mounting board, there should be at least two vertical support studs behind the board.*

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Step	Action
1.	Remove and rotate the bracket 90 degrees so that the flat of the bracket is downward the bottom of the shelf. (See Figure 3.)
2.	Mount the bracket to the shelf.
3.	Repeat steps 1 and 2 for the bracket on other side of the shelf.
4.	If mounting directly to a wall, locate a stud and mark a spot for the top bracket over the stud.
5.	Drill a pilot hole for the fastener at the marked spot (use whatever fasteners are appropriate per local practice).
6.	Mount the shelf using one of the fasteners through one of the brackets.
7.	Hold a level across the top of the shelf and level the unit.
8.	Mark the mounting surface for the other holes for the brackets.
9.	Drill pilot holes for the remaining fasteners at the marked spots.
10.	Install the remaining fasteners through the mounting brackets.
11.	Tighten the fasteners.



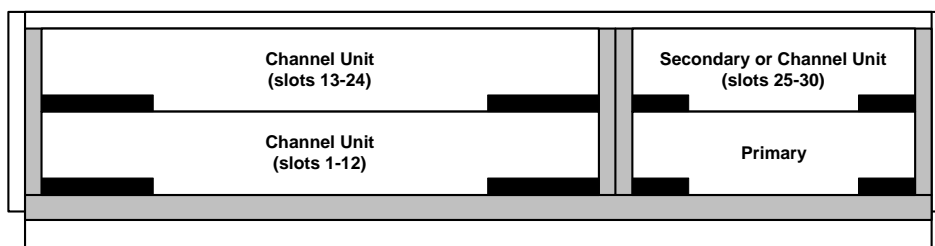
**Figure 3. Shelf Mounting Bracket Position for Wall Mount**

### 3.4 Desk Mounting

Step	Action
1.	Remove the shelf brackets.
2.	Install adhesive rubber feet to the bottom of the shelf.
3.	Place the shelf on a smooth flat surface and ensure that the shelf is stable.

## 4. Unit Installation

See Figure 4 for a sample of the shelf layout. For correct operation, install the PRI E1 unit in the primary slot; a second unit (SEC E1) may be mounted in the secondary slot in some applications.



**Figure 4. UMAP1100 Common Equipment Configuration**

## Installing a New Unit

The units mount in one unit slot of UMAP1100 shelf severally. All the units are equipped with an ejector. The ejector insert/reject lever facilities removal/install of the unit. Ensure that all manual optioning is done on the new unit. Besides, start the unit installation from the under slot to prevent component damage.

**NOTE:** Any manual optioning that is not done before the card is installed will require the system to discontinue service on all circuits when the card is removed for optioning in the future.

Step	Action
1	Insert the unit into the shelf, making sure that the unit is aligned with the card guides inside the shelf.
2	Slide the unit fully in to the shelf. <b>And at the same time, uplift the unit lightly to prevent the holder from scratching.</b> <i>Note: If there is already a rear panel installed on the shelf, check for interference. The rear panel may need to be removed and replaced with the real panel that has been shipped with the new unit.</i>
3	Once the unit is fully inserted, tighten the securing screw on the front panel of the unit.
4	If not already installed, install the rear panel, screwing it to the appropriate mounting locations on the shelf using the provided hardware.
5	Wire the unit per the wiring information in the wiring section. The unit will perform a self-test to ensure that it is compatible with the network management software on the system.
6	After the self-test is performed, check the software provisioning of the card using either the front panel craft interface on the front of the controller unit or the network management interface on the rear of the controller. (See the section on network management for more information on the operation of this interface.)



**CAUTION:** Installation and removal of channel units should be done with care. Do not force a unit into place. If excessive resistance is encountered while installing a unit, remove it, and check the card guides and connector to verify proper alignment and the absence of foreign material.

## Installing a Replacement Unit

If you are replacing a unit that is already in service, insure that the unit is the same as the unit being replaced.

<b>Step</b>	<b>Action</b>
1	Remove the wiring connectors from the front and rear of the unit.
2	Unscrew the front panel securing screw to release the unit from the shelf.
3	Using the card ejector, remove the unit from the shelf.
4	Inspect the manual optioning of the new unit and insure that the optioning is the same as the one removed.
5	Follow the procedure for installing a new unit.

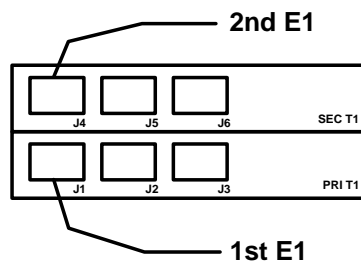
## 5. Signaling Cabling

### 5.1 E1 Controller Unit

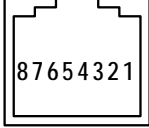
E1 connection uses a RJ-45 (J1) connector. The shelf cabling for the controller unit depends on the unit used.

Use the following steps to wire the unit.

Step	Action
1	Connect the first E1 line to the rear panel RJ-45 jack (J1).
2	Power and alarm should already be wired. If not, see the documentation for the UMAP1100 shelf.



**Table 1. The Pin Assignment of the J1 jack (RJ-45) on the rear panel.**

	Position = No. pin
	<b><i>Pin 1 = R1 (Receive)</i></b>
	<b><i>Pin 2 = T1 (Receive)</i></b>
	Pin 3 = x
	<b><i>Pin 4 = R (Transmit)</i></b>
	<b><i>Pin 5 = T (Transmit)</i></b>
	Pin 6 = x
	Pin 7 = x
	Pin 8 = x

## 5.2 Network Management Interface

There is a system-monitoring interface for VT-100 terminal on the front panel: the MGMT socket.

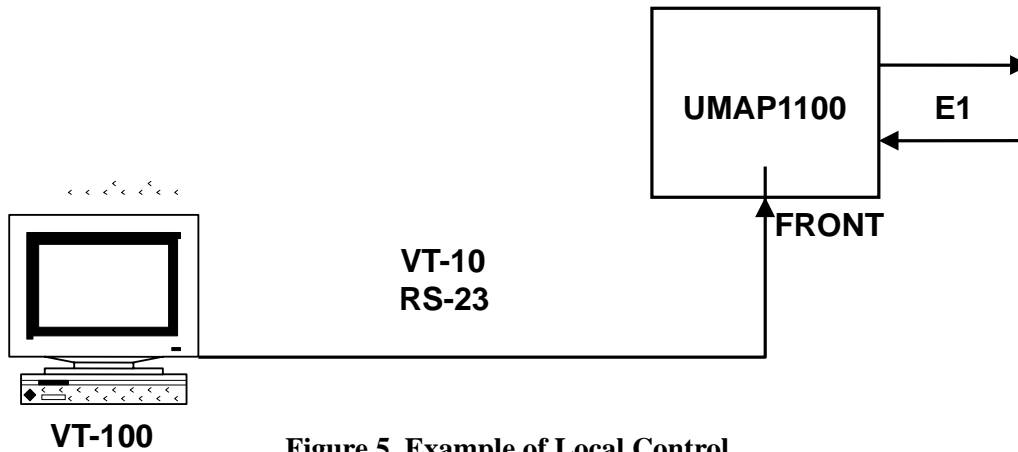
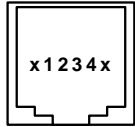


Figure 5. Example of Local Control

Table 3. The Pin Assignment of the MGMT Jack at Front Panel for VT-100 (RJ-11)

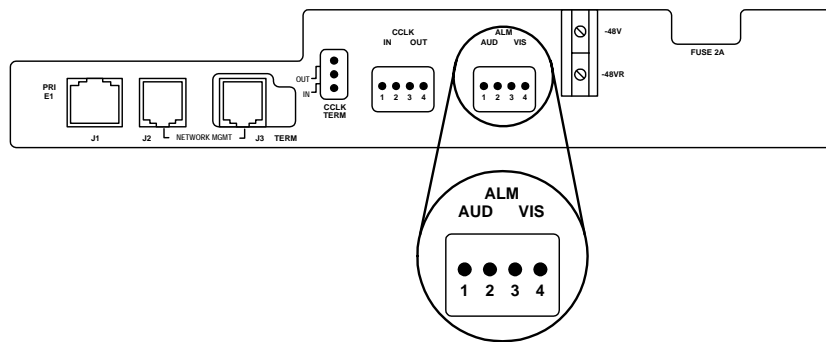
	Position = No. pin
	Pin 1 = Signal Ground ( <b>Must connected</b> )
	Pin 2 = Receive from DTE (Input to UMAP1100)
	Pin 3 = Transmit to DTE (Output from UMAP1100)
	Pin 4 = Signal Ground ( <b>Must connected</b> )

### 5.3 Channel Units

The shelf cabling for the channel units depends on the units used. See channel unit documentation for cabling information.

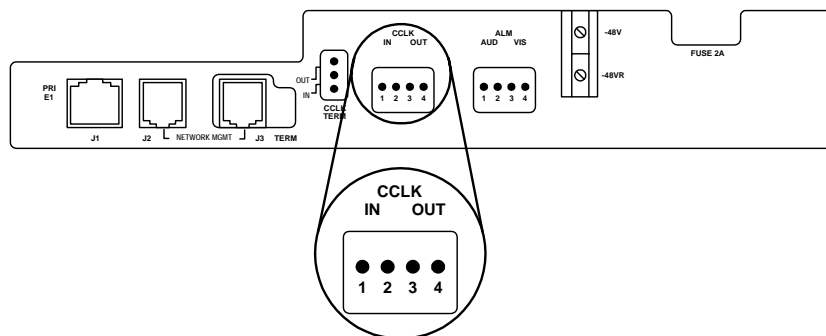
### 5.4 Alarm Connections

The alarm connections are modularized to ease future wiring changes. The connector is a 4-lead connector. The typical connection is expected to be 18 or 22 AWG wire. Open relay contacts indicate a non-alarm condition.



### 5.5 Composite Clock Connections

The composite clock connections are modularized to ease future wiring changes. The connector is a 4-lead connector. Two of the leads (pin 1, 2) are used to receive the composite clock signal into the UMAP1100. The other two leads (pin 3, 4) are to output the composite clock signal from the UMAP1100. The clock output leads are not to be used when the UMAP1100 is using office timing.



## 6. Power Connections

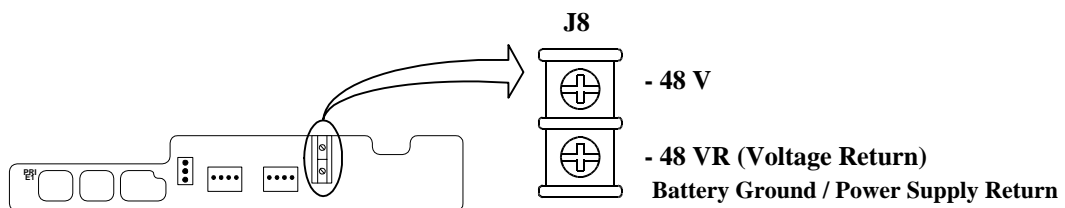
The shelf is powered from a -48 volt DC output power supply. The shelf should be powered from a fused power distribution panel. 18 AWG stranded wire should be used for -48 V and ground.



**CAUTION:** *Ensure that all power to the shelf power source (power distribution panel, etc.) is turned off.*

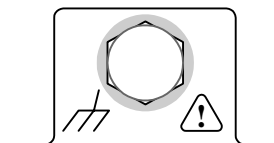
### Power Wiring

J8, located at the rear of the System Chassis, is used for connecting power to the System. It is not recommended that the DC power be chained from System Chassis to System Chassis. Although each DC/DC Converter has its own fuse, each System Chassis should have its own power fed from an external fuse panel. This prevents a blown fuse from interrupting service in more than one UMAP1100.



### Ground Wiring (Important!)

There is a ground connector on the rear panel of the shelf. **(Must connected!)**



**NOTE:** *To prevent possible serious injury, do not apply power to the UMAP1100 system at the central office or any remote site until after you finished the installation and connection of the system.*

## 7. Power Up

There are 2 types of units used in the shelf: the network interface unit and the channel units. At least one network interface unit is necessary for each shelf.

### 7.1 Power-Up the Unit

Step	Action
1.	After installing the shelf, apply power to the fused power distribution panel feeding the shelf.
2.	Using a DC voltmeter, check for proper voltage of -42 to -56 VDC across the -48 VR and -48V rear terminals.

### 7.2 Install / Test Units

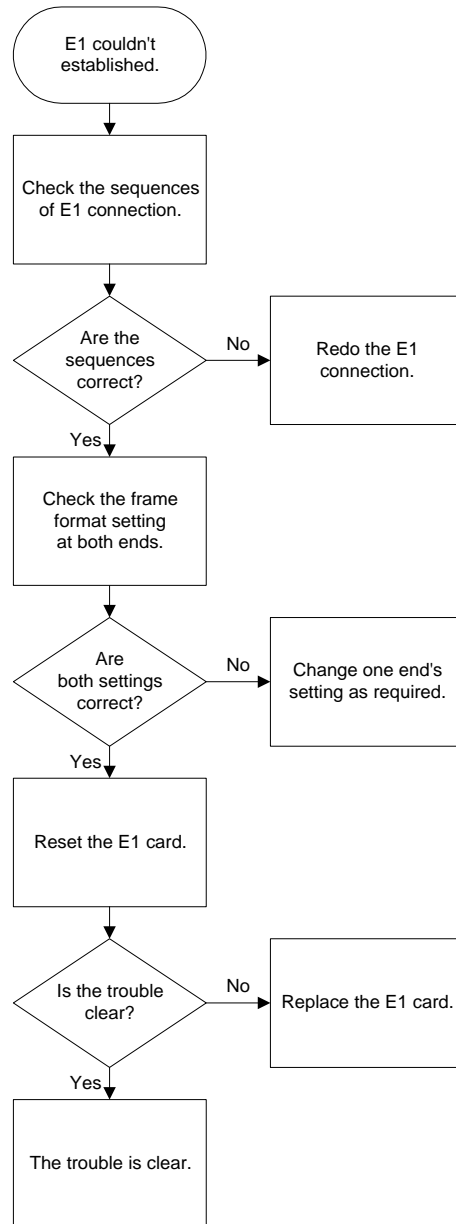
After verification of proper voltage at the power terminal strip, install the network interface unit. Power-up indications will depend on the individual unit. See the documentation for the unit you are installing.



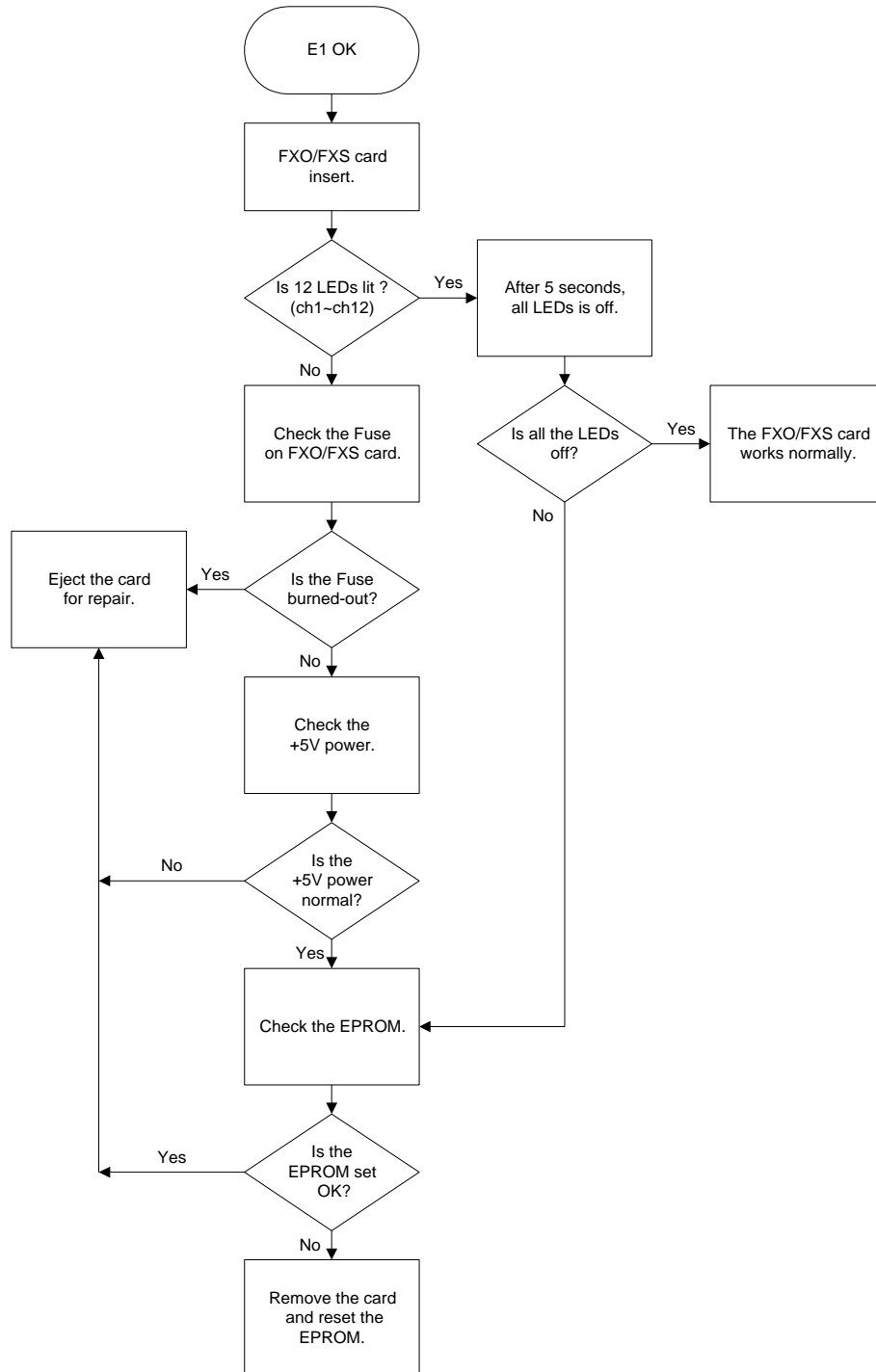
**CAUTION:** *Installation and removal of units should be done with care. Do not force a unit into place. If excessive resistance is encountered while installing a unit, remove the unit and check the card guides and connector to verify proper alignment and the absence of foreign material.*

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## E1 Install Test



### FXO/FXS Install Test



## CHAPTER 1. INTRODUCTION

### 1.1 Product Overview

The UMAP1100 is a thirty-circuit to E1 UMAP1100. It provides integrated common hardware in a very small 19"x12"x1¾" profile. The UMAP1100 is designed with future expansion. It offers remote provisioning and monitoring. The UMAP1100 sub-assemblies are modular and hot swappable with multiple circuits per module. The UMAP1100 is temperature hardened and cost effective.

UMAP1100 System provides multi-service modules, which includes:

- General subscriber Line Modules (FXO)

### 1.2 Packaging (Physical)

#### General packaging

The physical enclosure for this product is a 19"x12"x1¾" metallic case which includes the cable connector housings.

The enclosure contains module guides for any optional boards. All modules are field replaceable and shall have a circuitry cover panel at the rear of each module.

### **Rack mounting**

Removable side brackets are available for this product, that allow the product to be directly mounted in a 19" rack at both "flush" and "middle" mounting positions.

Repositioning the brackets will also enable mounting into a 23" rack.

### **Wall mounting**

Wall mounting is accomplished by rotating the removable side mounting brackets by 90 degrees.

### **Desk mounting**

Feet are included to raise the unit above the desk surface.

## **1.3 Functional**

### **Main Unit**

1. This UMAP1100 is to be used in a CO and a RT environment and is to be remotely controlled and configured from a central office or other central control point. The UMAP1100 when initially installed is intended to power up in a default configuration based on the type of optional modules that are installed in the UMAP1100.
2. The system is capable of storing all configuration data during an indefinite power outage.
3. The system provides on-hook transmission to support services such as CLASS.
4. E1 time-slot to circuit mappings is programmable and is default to the normal sequential (time-slot 1 to circuit 1, time-slot 2 to circuit 2.... time-slot 15 to circuit 15, time-slot 17 to circuit 16) connections unless reconfigured by the craft person.

## 1.5 Security

The 3 levels of password protection of NMS are:

1. Supervisor – Can assign new users, change passwords, purge files and all of the following.
2. User – Can read, modify and print files but not purge files.
3. Guest – Can only read files and print files and reports.

The default password will initially be used at time of shipment. This password can be changed by the user.

## 1.6 Interface

### 1.6.1 Front Panel Interface

#### LEDs on E1 module

- **AR - Red Local Alarm**

A red “local” alarm indicates that the problem exists immediately on this device. One red condition on an E1 interface is a LOS (Loss of Signal), Another red condition is LOF (Loss of Frame) and the other red condition is AIS (Alarm Indication Signal).

- **AY - Yellow Remote Alarm**

A yellow “remote” alarm indicates that a problem is “upstream” at some other device or network node. A yellow condition is an RAI (Remote Alarm Indicator).

- **TP - Yellow Trunk Processing (CFA) Alarm**

This alarm will be activated after an AY or AR occurs. The specific timing will be determined by the trunk-processing mode selected.

- **LP - Green Local Test Loopback**

This condition is for local testing purposes only and is initiated by a craftsman. E1 data is looped back towards the circuit slots and an unframed all ones signal is transmitted towards the network.

- **PWR - Green Power**

This is a power LED that is illuminated when the UMAP1100 is receiving power.

#### Configuration and control switches at front panel

The UMAP1100 front panel provides an Alarm-Cut-Off (Red) Switch to open the audible alarm contact on the main E1 module.

### 1.6.2 Rear Panel Interface

The rear Panel of the UMAP1100 has connectors with the circuits configured as defined in each module specification section.

### **E1 Connector**

A second module with a similar E1 connector will be required when drop and insert functionality is implemented.

### **TELCO Connector**

The rear of the UMAP1100 have one 25-pair Telco connector for each module (2W FXO/DPT, 2W FXS/DPO/PLARD, 2W ISDN, 4W OCU and 4W E&M) with the T&R and **T1&R1** circuits configured as defined in the specification section.

### **Power Supply Connector**

The Power Connector is a protected terminal connector labeled -48V battery and -48 VR (voltage return). The -48V battery return is referenced to circuit ground but is isolated from the frame ground.

### **Frame safety Ground Connector**

The frame grounding connector is a single screw terminal (ground lug) capable of connecting a 14 gauge wire to provide chassis ground connection.

### **Alarm Interface and Contacts**

1. The remote alarm contact connector is a 4-lead connector rated for 2 amps. One set of isolated contacts each for the audible and visual alarms. A typical connection is 22-gauge wire.
2. The system provides visual and audible alarm contact closure when the UMAP1100 is in alarm or there is a loss of power. When the ACO (Alarm Cut Off) is activated, the audible alarm contacts return to open circuit.

### **DDS Composite Clock Connector**

The optional external clock connector provide two wire balance input and two wire balanced output clock signals. The rear of the module provides a DDS clock termination resistor with a jumper.

### 1.6.3 E1 Interface

1. Drop and insert capability is accomplished with an additional optional E1 module. Data, voice and signaling from each timeslot have the ability to be routed (dropped) from the originating end of the E1 span to a local circuit. New data, voice and signaling from a different local circuit is then inserted into and replaces the timeslot of the E1 span which is then transmitted to the far end. This drop and insert exist for both transmit and received directions.
2. E1 clocking is provided by the incoming E1 line or an internal clock.
3. If a channel module is removed, all ones will be sent towards the E1 network for that module's timeslots.
4. When trunk processing or a CFA (AY or AR) condition exists, E1 signal freezing is used in both directions for as long as the condition continues and a quiet PCM code is sent to all circuits.

## Provisioning Functions

1. All provisioning parameters are selectable with the control interface software.
2. Alarm displays on the PC shall be capable of duplicating the LED alarm, system status, and circuit status information provided by the UMAP1100 controller in real time.
3. The circuit number, circuit name, customer contact person, phone contact, fax number, e-mail address, date the module was installed and trouble history is also to be stored.
4. The database is kept on the PC and can be printed in a legible format on 8.5-inch by 11-inch size paper.

## CHAPTER 2. PRIMARY E1 UNIT

### 2.1 General

#### Equipment Function

The Primary E1 unit (PRI E1) combines the functions of a line interface unit (LIU) and a channel service unit (CSU), allowing direct connections to public E1 networks.

#### Equipment Purpose

The PRI E1 unit provides all of the common logic functions, including E1 line interface, clock recovery and generation, frame detection and multiplex/demultiplex functions. Alarm monitoring is performed by an on-board micro-controller.

- Programmed via a VT-100 compatible terminal, or a PC running VT-100 terminal emulation software. The PRI E1 unit provides user-friendly menus and convenient status summaries for all programmable functions.
- Can be remotely programmed without any special software or hardware. The PRI E1 unit in conjunction with RS-422 and RS-232 can be used to remotely program all smart line cards.

The UMAP1100 maintains compatibility with public network telecommunications signals and equipment.

User-programmed options permit the PRI E1 unit to be compatible with different system configurations encountered in a range of applications. All user-programmed functions, configuration information, recent status information and long term Performance Data are retained in non-volatile memory, thus protecting the equipment from power failures.

## Equipment Features

This unit provides the following features:

- Front panel craft interface (MGMT) connected to a VT-100 terminal.
- Rear panel network management interface. (J2, J3)
- Front panel address switch (DIPS WITCH) for network management.
- Non-volatile storage of system provisioning and performance.
- Front panel status LEDs.
- Front panel E1 monitoring jacks (MON).
- Dry contacts for alarm indication.
- Terminal or 2-way drop and insert operation.
- Time slot assignment on a per-channel basis.
- Hot module insertion or extraction.
- 30-channel E1 multiplexing operation.
- Combines the functions of a LIU and a CSU, allowing direct connections to public E1 networks.
- Can operate in either 4a/G.704 and 4b/G.704 and performs the loopback, test and performance monitoring of the E1 interface (local).

## 2.2 Maintenance and Troubleshooting

### 2.2.1 Routine Maintenance

1. No mandatory routine maintenance is required for the PRI E1 unit.
2. Since the PRI E1 unit keeps long term Performance Data and logs all events, it is advisable to log onto each PRI E1 unit once a month and records the Performance Data and Event Log. Once the information is recorded, reset the Performance Monitors and clear the Event Log. This is purely optional and if not done, will have no adverse effects on the network.

### 2.2.2 Troubleshooting

Before troubleshooting a PRI E1 unit, first verify that configuration is correct and appropriate for the type of network the PRI E1 unit is used in. If this is the case, perform a Reboot on the PRI E1 unit. If the condition persists, reset Factory Defaults and reenter the configuration. If the condition still persists then a hardware fault is the likely cause.

## 2.4 Provisioning

This unit comes from the factory with default provisioning. This provisioning can be altered through a VT-100 terminal via craft port on front panel.

When this module is inserted in to a previously provisioned slot, if the card type matches, the module will change its provisioning options to match the previously provisioned module. If the module type does not match the module will assume its default provisioning.

The provisioning options are as follows with the default optioning noted:

Option	Choices	Default
UMAP1100 Address (= 1 + switch setting)		00
Network Management interface selection (VT-100)		Front
Network Management interface selection (GUI NMS)		Rear
Network Management interface parameters		9600, 8, 1, None
Default Super user ID		piad
Default Super user password		1234
E1 Frame format	CRC4, CAS ; conventional, CAS	CRC4, CAS
Transmit E1 Timing Source	External, Internal, Looped	Internal
E1 Line Code	HDB3	HDB3
CGA Process Mode	Normal, CM2, CM3	Normal
Remote Control Method	None, Occupy One Channel, Using Facility Data Link	Using Facility Data Link

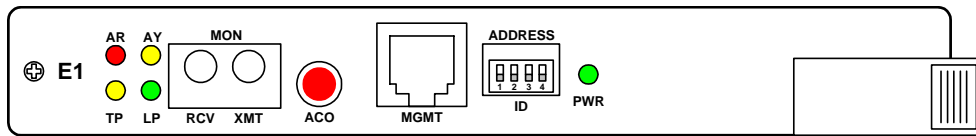
## 2.5 Specification

**Table 2-1. E1 Controller Unit Electrical Specification**

Parameter	Specification
Bit Rate - Internal Clock	2048 kbit/s, $\pm 50$ ppm
Synchronization	Drop/Insert mode: East <sub>out</sub> and West <sub>out</sub> are slaved to East <sub>in</sub> and West <sub>in</sub> respectively.  End Terminal mode: Loop, Internal, or External timing.
Channel bank input timing (software selectable) and composite clock output	<ol style="list-style-type: none"> <li>1. free running timing</li> <li>2. loop timing</li> <li>3. external timing: composite clock input terminal (on rear panel)</li> </ol>
Line Code	HDB3
Line Impedance	120 $\Omega$ balanced
Transmit Level	$\pm 3.0$ V balanced
Output Pulse Shape	Per Figure 15/G.703
Jitter Output	< 5 %
Jitter Tolerance	Per Table 2/G.823 (2048 kbit/s)
E1 Signal Attenuation	> 10 dB @ 1024 kHz
Multiframe Alignment Signal	per Table 9/G.704
Framing	Conventional: per Table 4a/G.704  CRC4: per Table 4b/G.704

## 2.6 Controls and Indicators

### Front Panel of E1

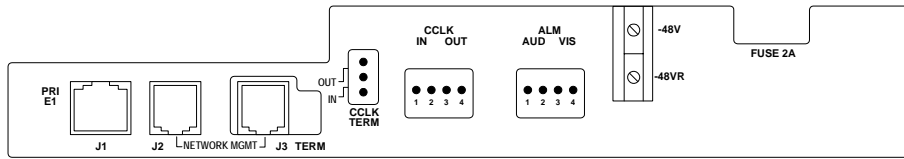


**Figure 2-3. E1 Front-Panel Layout**

**Table 2-2. E1 Controller Unit Front Panel Features**

Label	Color	Indication or Function
AR (LED)	Red	The problem exists immediately on this device. 1. E1 interface is on LOS (Loss of Signal) alarm. 2. E1 interface is on LOF (Loss of Frame) alarm. 3. E1 interface is on AIS (Alarm Indication Signal).
AY (LED)	Yellow	A yellow condition is an RAI (Remote Alarm Indicator).
TP (LED)	Yellow	It activated after AY or AR occurs. Indicates that the system is conditioning the signaling data based on detected alarm conditions.
LP (LED)	Green	Indicates that the unit is in a loopback condition where the data for each unit is looped back on itself. This indication only occurs during local testing.
PWR LED	Green	Illuminated when the UMAP1100 is receiving power.
ACO Pushbutton		When pressed, the audible alarm cut off. To open the audible alarm contacts from the UMAP1100 system. This switch will only mask audible indications of present alarm conditions. If a new alarm occurs, the alarm will re-enable.
MON jack		Allows monitoring of the E1 signal (both transmit (XMT) and receive (RCV)) without interfering with operations.
MGMT jack		The RJ-11 jack is the local/craft port (directly connect PC on front panel).
ID switch		Setting the system address on the system management bus.

## Rear Panel of E1



**Figure 2-4. E1 Rear-Panel Layout**

**Table 2-3. E1 Controller Unit Rear Panel Features**

Label	Indication or Function
FUSE 2A	Power Protection.
Power	-48V power wiring. (with screw lug) Refer to page 2-6~2-7.
ALM	Audible: pin 1 and 2. Visible: pin 3 and 4.
CCLK	In: pin 1 and 2. Out: pin 3 and 4.
CCLK TERM	Clock Terminal Resister. In: 135 ohm termination on composite clock input. Out: No termination on composite clock input.
J1	E1 connector. Related information refers to page 2-9. (RJ-45)
J2	GUI NMS connector (RJ-11).
J3	

## CHAPTER 5. FXO/2-WIRE FOREIGN EXCHANGE OFFICE

### 5.1 General

#### Equipment Function

The 2-Wire FXO unit is part of the UMAP1100, and is one of several types of channel units available for the UMAP1100. Each circuit on the FXO can be independently configured for a 2W FXO or DPT application. In the FXO application, this unit can be configured for loop start or ground start modes of operation. Each circuit can also operate in the *DPT* mode as a 2-wire loop with reverse battery supervision application.

The FXO card have full and half two sizes that user can choose based on real need.

The differences between full and half card are the size of card and the numbers of service channel. The full card supports 12 channels of FXO operation (services 12 channels), and the half card supports 6 channels of FXO operation (services 6 channels).

#### Equipment Features

The manual provides the following features:

- Prescription gain setting for the transmit and receive levels.
- Supports 6/12 channels of FXO/DPT/DID operation.
- Each channel is to be individually optional for 600 or 900 ohms plus 2.16 uf impedance, selected by NMS or VT-100 terminal via craft port.
- Loop-start or ground-start mode of operation.
- Gain adjustable for TX TLP and RX TLP from +6 ~ -10 dBm step 0.1 dBm, selected by NMS.
- On hook transmission for ANI function.
- Optional network per-channel loopback.
- Front-panel BUSY LED that indicates busy/idle status.
- Temperature hardened (-40°C to +65°C)

## **Network Management Interface**

This module is managed through a VT-100 terminal via craft port on front panel, which controls the provisioning of the unit and obtains status information from the unit. For operation of the NMS interface, see the Network Management System.

This unit will maintain its default provisioning until that provisioning is altered through the NMS. If this provisioning is changed, it will maintain the new provisioning even if power is lost. If replaced with a new unit, the new unit will default to the same provisioning as was set for the prior unit. If this unit is installed in a location that was used by a different type of unit, this unit will use its own default provisioning.

## **5.2 Function Description**

The following describes one of the 6/12 circuits on the FXO and can be considered typical of any of the 6/12 circuits.

### **5.2.1 Incoming Voice Operation All Modes**

Each circuit, or channel, of the unit receives digital voice and signaling information from the E1 unit of the UMAP1100. The digital voice information is converted to analog voice information and conveyed to the level adjusting circuit. The range of the received voice information can be adjusted for a transmission level point (TLP) of +6 to -10 dBm. The voice information goes through a hybrid, which transmits it to the two wire transmission facilities. The impedance of the hybrid can be configured for either a balanced 600 or 900 ohm facility.

### **5.2.2 R2 Line Signaling**

The FXO converts between ITU R2 line signaling and 2-Wire Loop Signaling. The FXO provides one way calling from a remote analog PBX to an R2 signal central office.

**Table 5-1. Loop Start Signal Procedure**

FXO						FXS				
<b>Incoming to station</b>										
	Tx		Rx			Tx		Rx		
	A	B	A	B		A	B	A	B	
No ringing	1	0	1	0		1	0	1	0	On-hook
Ringing	0	0	1	0	→	1	0	0	0	On-hook
No ringing	1	0	0	0	←	0	0	1	0	Off-hook
No ringing	1	0	1	0	←	1	0	1	0	On-hook
<b>Outgoing from station</b>										
No ringing	1	0	1	0		1	0	1	0	On-hook
No ringing	1	0	0	0	←	0	0	1	0	Off-hook
No ringing	1	0	1	0	→	1	0	1	0	On-hook

## 5.3 Installation

### Wiring the Unit

**Table 5-2. PIN CHART for 50-pin (25-pair) Telco Connector**

Circuit 1	Pin 1 = R	Pin 26 = T
	Pin 2 = Not connected	Pin 27 = Not connected
Circuit 2	Pin 3 = R	Pin 28 = T
	Pin 4 = Not connected	Pin 29 = Not connected
Circuit 3	Pin 5 = R	Pin 30 = T
	Pin 6 = Not connected	Pin 31 = Not connected
Circuit 4	Pin 7 = R	Pin 32 = T
	Pin 8 = Not connected	Pin 33 = Not connected
Circuit 5	Pin 9 = R	Pin 34 = T
	Pin 10 = Not connected	Pin 35 = Not connected
Circuit 6	Pin 11 = R	Pin 36 = T
	Pin 12 = Not connected	Pin 37 = Not connected
Circuit 7	Pin 13 = R	Pin 38 = T
	Pin 14 = Not connected	Pin 39 = Not connected
Circuit 8	Pin 15 = R	Pin 40 = T
	Pin 16 = Not connected	Pin 41 = Not connected
Circuit 9	Pin 17 = R	Pin 42 = T
	Pin 18 = Not connected	Pin 43 = Not connected
Circuit 10	Pin 19 = R	Pin 44 = T
	Pin 20 = Not connected	Pin 45 = Not connected
Circuit 11	Pin 21 = R	Pin 46 = T
	Pin 22 = Not connected	Pin 47 = Not connected
Circuit 12	Pin 23 = R	Pin 48 = T
	Pin 24 = Not connected	Pin 49 = Not connected
Spare line	Pin 25 = Frame Ground	Pin 50 = Frame Ground

## 5.4 Provisioning

This unit comes from the factory with default provisioning. This provisioning can be altered through the a VT-100 terminal via craft port on front panel.

When this module is inserted in to a previously provisioned slot, if the card type matches, the module will change its provisioning options to match the previously provisioned module. If the module type does not match the module will assume its default provisioning.

The provisioning options are as follows with the default optioning noted:

Option	Choices	Default
Per circuit forced busy	On, Off	Off
Per circuit timeslots allocation	1-30	Sequence
Per circuit channel type	FXO/GS, FXO/LS, DPT/NORMAL, DPT/WINK, DID	FXO/LS
Per circuit interface impedance	600 Ohm, 900 Ohm	600 Ohm
Per circuit transmit gain setting (TTLP)	-10.0 to +6.0 dBm	0 dBm
Per circuit receive gain setting (RTLP)	-10.0 to +6.0 dBm	-3.0 dBm
Per circuit CGA Immediate action	idle, busy	Idle
Per circuit CGA Delayed action	idle, busy	Busy

\* **GS: Ground Start**

**LS: Loop Start**

## 5.5 Specification

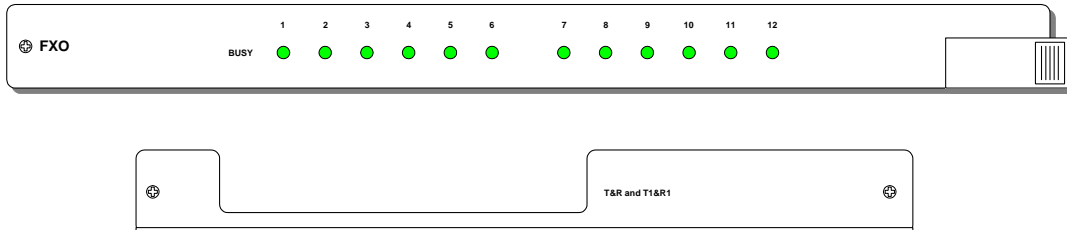
**Table 5-3. 2W FXO/DPT Channel Unit Specification Model**

Parameter	Function Specification
Number of Subscriber for Each Module:	12 circuits.
Quantizing Level:	8 bit, A-law
Insertion Loss:	0 ±0.5 dB (@ 1004Hz)
XMT INPUT TLP RANGE	-10.0 ~ +6.0 dBm
XMT default input level	0 dBm
RCV OUTPUT TLP RANGE	-10.0 ~ +6.0 dBm
RCV default output level	-3.0 dBm
XMT and RCV PRESRIPTION ATTN	0 to 16 dB in increments of 0.1 dB
Loss from Frequency Change:	
300 – 3000 Hz	-0.25 ~ +0.5 dB
3000 – 3400 Hz	-0.25 ~ +1.5 dB
Gain from Input Level Tracking (Single circuit):	
+ 3 ~ -37 dBm0	< 0.25 dB
-37 ~ -50 dBm0	< 0.50 dB
Impedance:	900 Ohm + 2.16 uf or 600 Ohm + 2.16 uf Selected by NMS or VT-100 terminal via craft port.
Return loss:	
ERL	≥ 28 dB
SRL	≥ 15 dB
Longitudinal Balance:	
300 – 600 Hz	≥ 53 dB
600 – 2400 Hz	≥ 53 dB
2400 – 3000 Hz	≥ 53 dB
3000 – 3400 Hz	≥ 46 dB
Idle Channel Noise:	Max 20 dBmCO.

Signal to Quantizing Distortion Ratio:	
0 ~ -30 dB	33 dB
-30 ~ -40 dB	27 dB
-40 ~ -45 dB	22 dB
Cross Talk Attenuation:	> 65 dB
Loopback:	PC interface control loopback for codec to network side loopback. (Hybrid echo test.)
Ring Voltage Circuit Sensitivity:	65 Vrms at 20 Hz minimum
Tip Ground Circuit Sensitivity:	850 ohm and less for detection 10,000 ohm and more for no detection
Ring Ground Nominal Circuit Resistance:	410 ohms
Circuit internal loop resistance:	360 ohms minimum DC resistance of circuit 670 ohms maximum DC resistance of circuit
Operating Environment:	(in service) -40°C ~ +65°C < 95% RH

## 5.6 Controls and Indicators

### FXO Full Card (12 Channels)

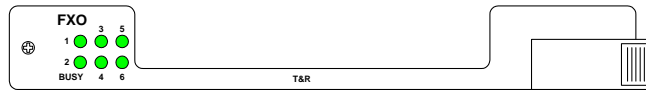


**Figure 5-1. FXO Front/Rear Panel Layout (Full Card)**

**Table 5-4. FXO Front/Rear Panel Features**

Indicator Name / Color	Indication or Function
BUSY 1 indicator (green)	User line 1 in service (occupied)
BUSY 2 indicator (green)	User line 2 in service (occupied)
BUSY 3 indicator (green)	User line 3 in service (occupied)
BUSY 4 indicator (green)	User line 4 in service (occupied)
BUSY 5 indicator (green)	User line 5 in service (occupied)
BUSY 6 indicator (green)	User line 6 in service (occupied)
BUSY 7 indicator (green)	User line 7 in service (occupied)
BUSY 8 indicator (green)	User line 8 in service (occupied)
BUSY 9 indicator (green)	User line 9 in service (occupied)
BUSY 10 indicator (green)	User line 10 in service (occupied)
BUSY 11 indicator (green)	User line 11 in service (occupied)
BUSY 12 indicator (green)	User line 12 in service (occupied)
TELCO 25-pair connector (Male)	T&R signal connector at <b>rear</b> panel for transmitting voice information. <i>See page 5-4 for pin assignment.</i>

### FXO Half Card (6 Channels)



**Figure 5-2. FXO Front Panel Layout (Half Card)**

**Table 5-5. FXO Front Panel Features**

<b>Indicator Name / Color</b>	<b>Indication or Function</b>
TELCO 25-pair connector (Male)	T&R signal connector at <b>rear</b> panel for transmitting voice information. <i>See page 5-4 for pin assignment.</i>
BUSY 1 indicator (green)	User line 1 in service (occupied)
BUSY 2 indicator (green)	User line 2 in service (occupied)
BUSY 3 indicator (green)	User line 3 in service (occupied)
BUSY 4 indicator (green)	User line 4 in service (occupied)
BUSY 5 indicator (green)	User line 5 in service (occupied)
BUSY 6 indicator (green)	User line 6 in service (occupied)