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REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
1.0	Preliminary	Mar 06
1.1	Standardized Format	Mar 07
1.2	Updated card edge drawing	Nov 07
1.3	Added features, block diagram, technical specs & <i>VistaLINK</i> [®] section.	Nov 08
1.4	Removed references to GPI, GPO, LTC specifications	Apr 09
1.5	Removed block diagram	Nov 09

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1. OVERVIEW

The 7700PTX Universal Protocol Translator module provides an interface between third-party and Evertz equipment. The 7700PTX communicates with third-party equipment either via one of four serial ports or via a built in Ethernet port. These ports can provide bi-directional protocol support.

Function:

The function of the 7700PTX generally falls into one of 4 categories:

1. **Third-Party Router Control:** In this mode the 7700PTX affords *VistaLINK®* the ability to control and monitor third-party routers. The 7700PTX can convey UMD information to Evertz monitoring equipment.
2. **Third-Party UMD Interface:** In this mode the 7700PTX translates third-party UMD protocol data into a format suitable for Evertz monitoring equipment.
3. **Third-Party Switcher Interface:** In this mode the 7700PTX extracts tally information from third-party switchers and translates and conveys that tally information to Evertz monitoring equipment.
4. **Third-Party Device Control:** In this mode the 7700PTX allows *VistaLINK®* to control third-party devices such as satellite controllers.

Features:

- 4 serial ports RS232/422 selectable
- Modular, conveniently fits into 7700FR-C 3RU frame
- Frame status trigger
- *VistaLINK®* - capable for remote monitoring and control via SNMP (using *VistaLINK®*PRO)

The 7700PTX-QUTZ is designed to control and/or monitor a Quartz router via the Quartz Remote Protocol No. 1. The 7700PTX-QUTZ can operate in either or both of two modes:

1. **A control mode:** *VistaLINK®* Pro performs router cross-point switches.
2. **A monitor mode:** The 7700PTX-QUTZ monitors the router for cross point changes and transmits label or description information to a UMD (Under Monitor Display).

The 7700PTX-QUTZ is a network-controlled protocol translator that translates SNMP (Simple Network Management Protocol) application commands into Quartz Remote Control Protocol packets. The translated packets are then transmitted to one of up to four Quartz routers. These routers are connected serially to the 7700PTX-QUTZ. Normally, the 7700PTX-QUTZ would connect to the router designated by the master.

Figure 1-1 shows a typical 7700PTX-QUTZ setup.

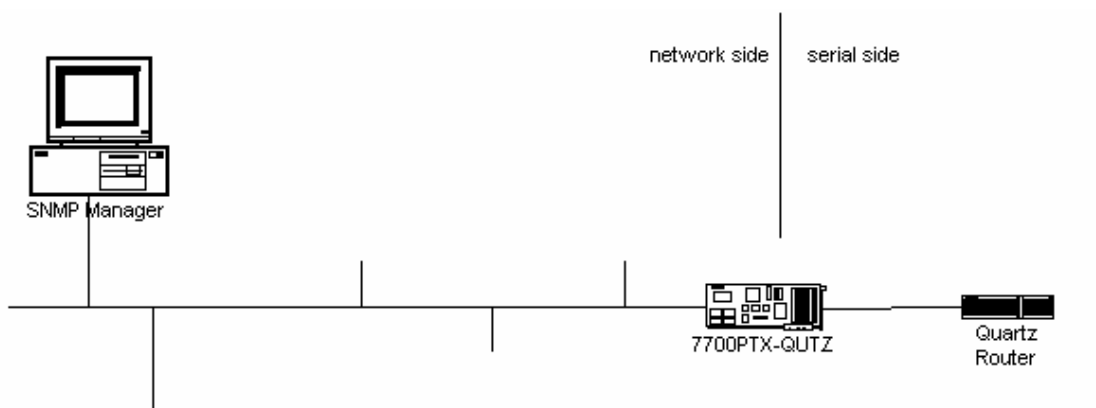


Figure 1-1: Typical 7700PTX-QUTZ Setup

2. CARD EDGE CONTROLS

2.1. DETERMINING CURRENT IP ADDRESS SETTINGS

To read the current IP address during normal operation, press the toggle switch DOWN. The IP address can be read on the four-character alphanumeric display.

2.2. RESTORING FACTORY DEFAULTS

To restore all settings to factory defaults, apply power to the card while holding the toggle switch UP until the green LED illuminates.

2.3. CARD EDGE LEDS

LED 22 is illuminated when Ethernet activity is detected.

All other card edge LEDs are for factory use only.

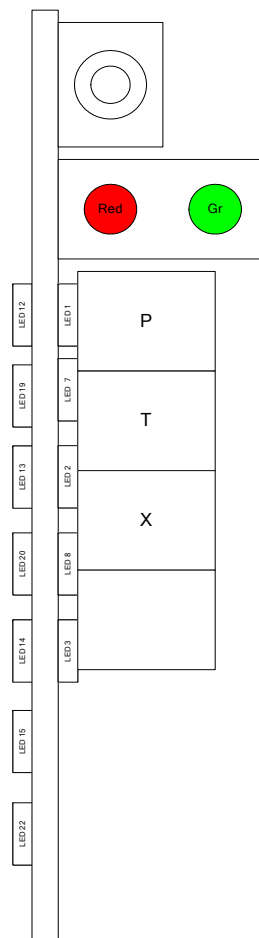


Figure 2-1: PTX Card Edge

3. TECHNICAL SPECIFICATIONS

3.1. DATA INPUT SERIAL PORT

Number of Ports: 4 RS-232 or 3 RS-422
Connector: Phoenix Terminal Block pins
Baud Rate: Up to 1Mbaud

3.2. ELECTRICAL

Voltage: +12V DC
Power: < 6W
Safety: ETL Listed, complies with EU safety directives
EMI/RFI: Complies with FCC Part 15, Class A
EU EMC Directive

3.3. PHYSICAL

Number of Slots: 2

4. CONFIGURATION

4.1. CONFIGURATION STEPS

Perform the following steps to configure the 7700PTX-QUTZ:

1. Connect a PC running a console application to the PTX debug/monitor port via the adapter cable.
2. Configure the 7700PTX-QUTZ's network parameters.
3. Configure the parameters of each serial port to match those of the router(s).
4. Configure the number of inputs and outputs to match those of the router(s).
5. Configure the levels involved in a cross point write (a set).
6. Configure the level monitored in a cross point read (a get).
7. Configure UMD peers if required.
8. Power off the 7700PTX-QUTZ.
9. Physically wire the serial port(s) of the 7700PTX-QUTZ to the router(s).
10. Power on the 7700PTX-QUTZ.



The 7700PTX-QUTZ is normally connected to the master Quartz router.

4.2. DEBUG/MONITOR PORT CONNECTION

The 7700PTX-QUTZ is configured via the debug/monitor port, the header of which is labelled J1. A special Evertz adapter cable allows this port to connect to the COM port of a personal computer. The following steps describe this procedure.

1. Locate the small, keyed, four-pin end of the upgrade cable provided by Evertz.
2. Connect it to the four-pin interface (J1) near the front of the 7700PTX, directly above the card unlock latch.

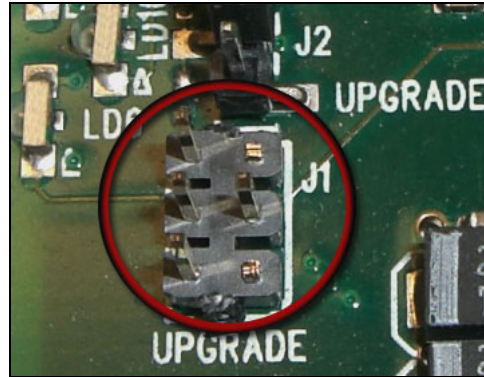


Figure 4-1: Upgrade Jumper

3. Connect the other end of the upgrade cable to a straight-through serial cable. Connect the serial cable to the serial or COM port of the computer.
4. Initiate HyperTerminal on your computer by selecting:
“Start\Programs\Accessories\Communications\HyperTerminal”.
5. Enter a name for your connection, for example: PTX.
6. Press the <Enter> key. A new “Connect To” window opens.



Figure 4-2: ‘Connect To’ Window

7. Select COM1 for the “*Connect using*” setting. If COM1 is in use, choose an alternate COM port.
8. Press the <Enter> key or select OK. This opens the “COM Properties” window as shown in Figure 4-3.

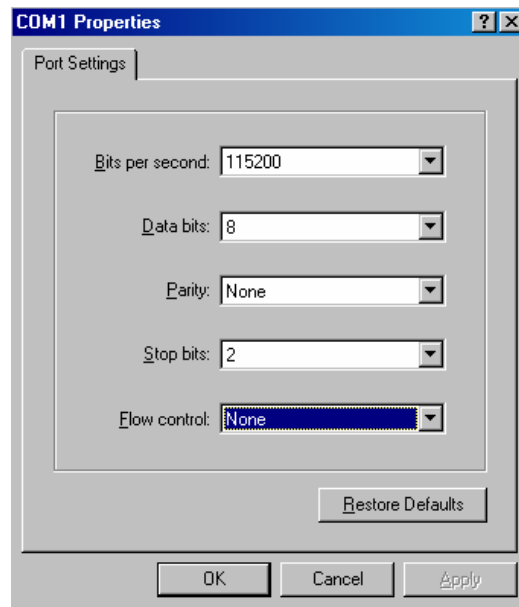


Figure 4-3: COM1 Properties

9. Enter the information as listed in Figure 4-3.
10. Press the <Enter> key or select OK. The "COM Properties" window closes, leaving the HyperTerminal window open.
11. Apply power if the 7700PTX-QUTZ does not have power. The boot sequence and Main Menu are displayed in the HyperTerminal window.
12. If the 7700PTX-QUTZ has power, press the <Enter> key to view the 7700PTX-QUTZ's menu system.
13. Various 7700PTX-QUTZ parameters are configurable via the 7700PTX-QUTZ's menu system, the root of which is called *Main Menu*.

4.3. MAIN MENU

Table 4-1 lists the entries available in the 7700PTX-QUTZ's *Main Menu*.

Entry	Item	Notes
1	Network Configuration	IP address, subnet mask, gateway, etc.
2	Serial Port Setup	Baud rate, number of data bits, etc. of serial ports which connect to Datatek router(s)
3	SNMP Setup	IP address of SNMP manager(s) to receive traps
4	Quartz Protocol Settings Setup	Settings specific to the router and the Quartz Remote Control Protocol.
5	Under Monitor Display Setup	IP address and TCP port of PPV to receive the description of the input associated with a particular output
6	Engineering/Debug	Used for troubleshooting

Table 4-1: 7700PTX-QUTZ Main Menu

4.4. NETWORK CONFIGURATION

1. From the *Main Menu* select *Network Configuration*.
2. If DHCP (Dynamic Host Configuration Protocol) is desired, then the *Use DHCP* field is set to *True*. Otherwise, the IP address, subnet mask, and gateway (if any) are set and the *Use DHCP* field is set to *False*.
3. Once the network settings are configured, select *Save* and *Exit* before exiting the *Network Configuration* to save the settings, otherwise select *Exit*.



The 7700PTX-QUTZ must be rebooted for any network setting changes to take effect.

4.5. SERIAL PORT SETUP

4.5.1. Parameters

The 7700PTX-QUTZ has four serial ports. The parameters associated with each serial port are listed in Table 4-2. Typically, the Quartz router is set to 38400 baud, 8 data bits, no parity, 1 stop bit.

Parameter	Special Notes
Baud Rate	
Data Bits	
Parity	
Stop Bits	
Standard	For serial port 4, only RS-232 is valid.

Table 4-2: Serial Port Parameters



The serial port settings of the 7700PTX-QUTZ must match those of the router(s). The 7700PTX-QUTZ must be rebooted for any serial parameter changes to take effect.

4.5.2. Back Plate

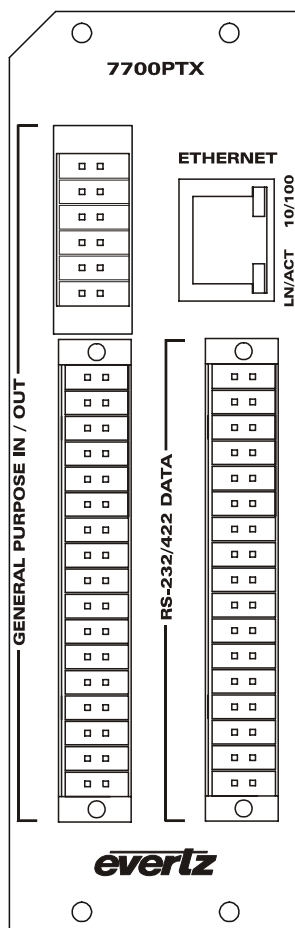


Figure 4-4: 7700PTX Back Plate

4.5.3. RS-232 Wiring

Figure 4-5 shows which pins of the back plate are used for RS-232 serial connections.

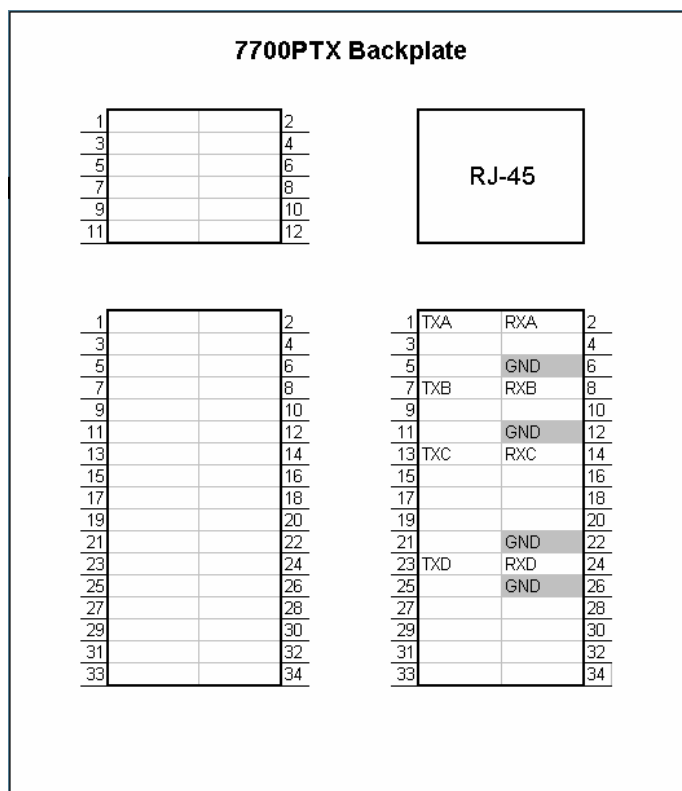


Figure 4-5: RS-232 Pins

Table 4-3 details how to connect the 7700PTX-QUTZ to the router for RS-232 operation.

7700PTX-QUTZ			Router	
Port	Pin Name	Pin	DB9 Male Pin	Pin Name
1	TXA	1	3	RX
	RXA	2	7	TX
	GND	6	6	GND
2	TXB	7	3	RX
	RXB	8	7	TX
	GND	12	6	GND
3	TXC	13	3	RX
	RXC	14	7	TX
	GND	22	6	GND
4	TXD	23	3	RX
	RXD	24	7	TX
	GND	26	6	GND

Table 4-3: RS-232 Wiring



The 7700PTX-QUTZ's fourth serial port is not RS-422 capable.

4.6. SNMP SETUP

Table 4-5 lists the parameters associated with the SNMP setup.

Parameter	Notes
Read-only community	Community string used for SNMP gets. The default is <i>public</i> .
Read-write community	Community string used for SNMP gets or sets. The default is <i>private</i> .

Table 4-5: SNMP Parameters



These parameters must match those of the SNMP manager. Changes to these parameters do not require a reboot of the 7700PTX-QUTZ.

4.7. QUARTZ REMOTE CONTROL PROTOCOL CONFIGURATION



Changes to any of these parameters do not require a reboot of the 7700PTX-QUTZ.

4.7.1. Number of Router Inputs & Outputs

The Quartz Remote Control Protocol does not permit the 7700PTX-QUTZ to automatically determine the number of sources and destinations associated with a given level. The number of inputs (or sources) and outputs (or destinations) associated with must be retrieved using *WinSetup*. The number of router inputs and outputs retrieved must be set on the 7700PTX-QUTZ. This can be accomplished by:

- Using *VistaLINK*[®] Pro
- Using the 7700PTX-QUTZ's *Quartz Protocol Settings Setup* menu

To configure the number of router inputs and outputs from the console follow the steps outlined below:

1. From the *Main Menu* select *Quartz Protocol Settings Setup*.
2. Select *Quartz Protocol Setup For Serial Port 1* (or the relevant serial port to which the Quartz router is connected).
3. Select *Set number of inputs*.
4. Enter the number of router inputs.
5. Select *Set number of outputs*.

6. Enter the number of router outputs.
7. Select *Save and Exit*.

4.7.2. Write Levels

By default the 7700PTX-QUTZ uses level V (the video or first level) when issuing a cross point switch request to the Quartz router. Should this need to be changed the console can be used as follows:

1. From the *Main Menu* select *Quartz Protocol Settings Setup*.
2. Select *Quart Protocol Setup For Serial Port 1* (or the relevant serial port to which the QUTZ router is connected).
3. Use *Add crosspoint write level* and *Remove crosspoint write level* to set the write levels according to Table 4-6.
4. Select *Save and Exit*.

WINSETUP LEVEL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Protocol Level	V	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O

Table 4-6: WinSetup/Protocol Level Associations

As an example, suppose WinSetup is used to create the following:

Level Number	Level Name	Associated Router
1	Video	32x32 Serial Video
2	Left	32x32 Digital Audio
3	Right	32x32 Digital Audio

The 7700PTX-QUTZ will have its write levels configured as *VAB* to allow simultaneous switching of levels 1, 2, and 3.

4.7.3. Read Level

By default the 7700PTX-QUTZ monitors level V. Should this need to be changed the console can be used as follows:

1. From the *Main Menu* select *Quartz Protocol Settings Setup*.
2. Select *Quartz Protocol Setup For Serial Port 1* (or the relevant serial port to which the Quartz router is connected).
3. Select *Set crosspoint read level*.

4. Enter the level to monitor.
5. Select *Save and Exit*.

The read level should correspond to one of the write levels. Using the example above, level *V* would remain the read level.

4.7.4. Removal of Numbers from Source & Destination Names

Some Quartz routers prepend a number to a source or destination name. By default, the 7700PTX-QUTZ removes these numbers. If the numbers are desired then this setting should be set to *No*. This parameter can be modified as follows:

1. From the *Main Menu* select *Quartz Protocol Settings Setup*.
2. Select *Quartz Protocol Setup For Serial Port 1* (or the relevant serial port to which the Quartz router is connected).
3. Select *Remove numbers from source/destination names*.
4. Make your selection at the prompt.
5. Select *Save and Exit*.

4.8. UNDER MONITOR DISPLAY SETUP

The 7700PTX-QUTZ has the ability to transmit router source label information to the UMDs of up to 12 PPVs.

As an example, suppose we have the setup of Figure 4-7.

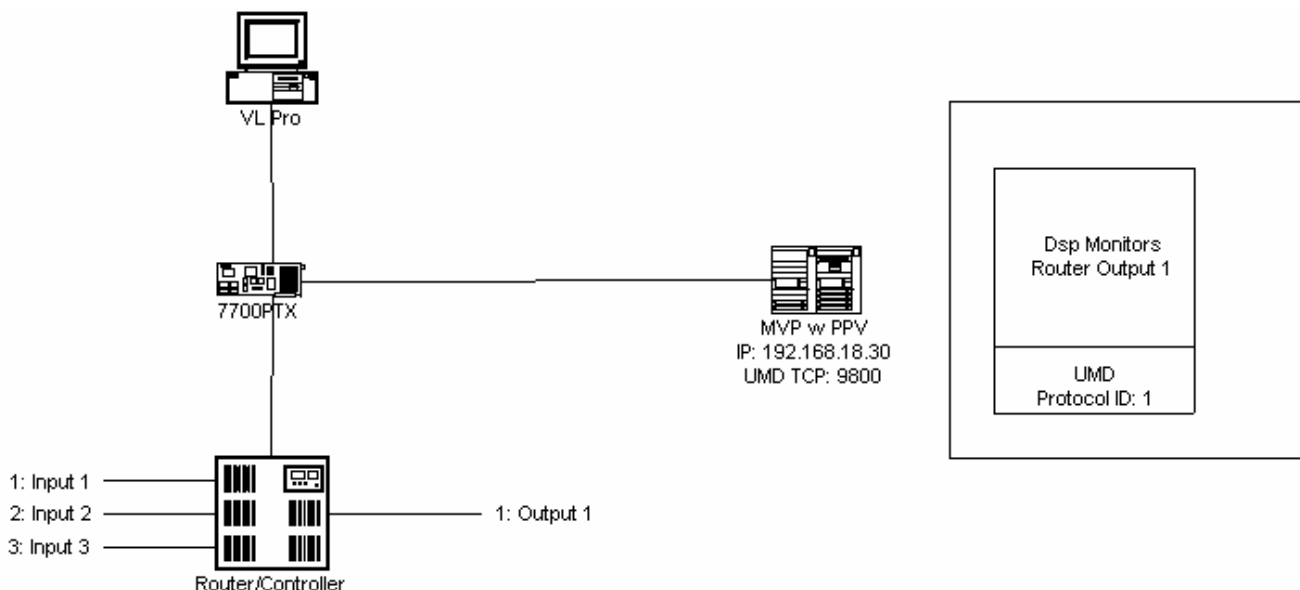


Figure 4-7: UMD Example

Where:

- A router has 3 inputs connected (labeled Input 1, Input 2, and Input 3) and 1 output (labeled Output 1)
- A 7700PTX-QUTZ monitors the router cross points
- An MVP contains a PPV with IP address 192.168.18.30
- The PPV is set to receive UMD data via the Image Video protocol over a TCP, with TCP port configured at 9800
- Protocol ID (PID) set to 1
- A PC running *VistaLINK*[®] Pro configures the 7700PTX-QUTZ so that the UMD PID associated with router Output 1 matches the PID of the UMD (for example, 1)

The *Under Monitor Display Setup* menu allows the configuration of the IP address and TCP port of the PPV to receive router source label information. In keeping with the above example, the 7700PTX-QUTZ would be configured to have a peer 1 IP address of 192.168.18.30 and a TCP port of 9800. When router input 1 is on output 1, the UMD of the display should display INPUT 1. If the cross point is switched to input 3, the UMD should display INPUT 3.



The 7700PTX-QUTZ must be rebooted for any UMD peer changes to take effect.

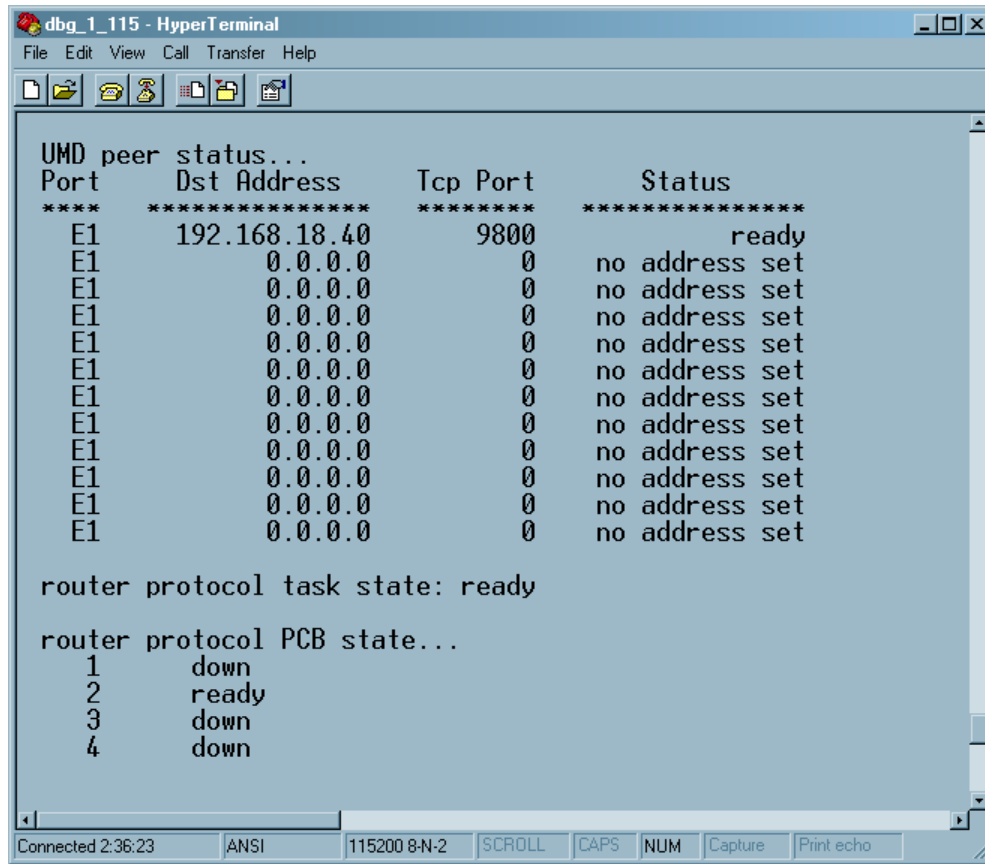
5. TROUBLESHOOTING TIPS

5.1. VLPRO NOTES

1. The 7700PTX-QUTZ must be able to communicate with any connected routers in order for VLPro to operate properly.
2. The 7700PTX-QUTZ must be able to communicate with its configured UMD peers before UMD information can be transmitted.
3. VLPro must associate a UMD protocol ID with a router output in order for UMD information to be transmitted.

5.2. CHECKING ROUTER COMMUNICATION

1. From the *Main Menu* select *Engineering/Debug*.
2. Select *Show task state*.
3. There are four entries, one for each serial port, listed under the heading *Router protocol PCB state...* If the state associated with the serial port is reported as *ready* then the 7700PTX-QUTZ is actively communicating with the router on that port. If the state is consistently reported as *down* then the 7700PTX-QUTZ is unable to communicate with the router in which case the serial port settings or wiring should be checked.
4. Figure 5-1 shows the 7700PTX-QUTZ is able to communicate with a router connected to port 2.



```

dbg_1_115 - HyperTerminal
File Edit View Call Transfer Help

UMD peer status...
Port      Dst Address      Tcp Port      Status
****      *****          ****          *****
E1        192.168.18.40    9800          ready
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set
E1        0.0.0.0          0             no address set

router protocol task state: ready

router protocol PCB state...
1         down
2         ready
3         down
4         down

Connected 2:36:23  ANSI  115200 8-N-2  SCROLL  CAPS  NUM  Capture  Print echo
  
```

Figure 5-1: Communication States

5.3. CHECKING UMD PEER COMMUNICATION

1. From the *Main Menu* select *Engineering/Debug*.
2. Select *Show task state*.
3. The status of up to 12 UMD peer entries is listed under the heading *UMD peer status...* A status reported as *ready* indicates the 7700PTX-QUTZ is able to communicate with that UMD peer. A status consistently reported as something other than *ready* indicates the inability of the 7700PTX-QUTZ to communicate with that UMD peer. Be sure that the UMD peer has been rebooted after being configured to receive the Image Video over TCP.
4. Figure 5-1 shows that the 7700PTX-QUTZ is able to communicate with the UMD peer whose IP address is 192.168.18.40 and who is listening on TCP port 9800.

5.4. ROUTER POLLING

By default, the 7700PTX-QUTZ polls each router at ten-second intervals. A poll consists of a *Router Connected* request packet. Polling detects changes in 7700PTX-QUTZ-to-router connection status (active/inactive). A change in router status results in an SNMP trap being sent to any configured trap hosts.

This poll duration can be changed via the *Set Router Poll Status* entry of the *Engineering/Debug* menu. The time between polls can be set on a per-serial port basis. If 0 is selected as the time between polls, polling is disabled.

Once set, the router poll status setting takes effect immediately; no reboot is necessary. It is saved to flash and recalled should the 7700PTX-QUTZ be powered off, and then on.

6. PERFORMING A FIRMWARE UPGRADE

There are two ways to upgrade PTX firmware:

1. Using FTP to perform the upgrade via TCP/IP. (*recommended procedure*)
2. Using a terminal application such as *HyperTerminal* to perform the upgrade via a serial connection.

6.1. FTP PROCEDURE

1. Open a command prompt window (in Windows: Start/Programs/Accessories/Command Prompt)
2. Enter the location of the firmware file. For example, type `cd c:\temp`.
3. Enter the command `ftp` followed by the PTX IP address.
For example, type `ftp -A 192.168.18.22`.
4. Enter the FTP command `put` followed by the firmware file name. For example, `put ptx.bin`.
5. When the transfer is complete enter the FTP command: `bye`.
6. Step 5 begins the process of saving the firmware to the non-volatile flash of the PTX. The save process is displayed as a percentage on the PTX LCD. Once the process is complete, the PTX LCD again displays the product name and firmware version.
7. Power off the PTX.
8. Power on the PTX.

6.2. SERIAL PROCEDURE

1. Power off the PTX.
2. Connect an adapter cable to a PC running a console or terminal application, such as Windows *HyperTerminal*, to the PTX debug/monitor port.
3. Configure the port settings of the terminal program as follows:

Baud	115200
Parity	no
Data bits	8
Stop bits	2
Flow Control	None

4. Set the PTX run/upgrade jumper to the upgrade position.
5. Power on the PTX.
6. After a few moments, the prompt `PPCBOOT>` will appear. Enter the command `upload`.

7. Start the firmware upload on the terminal application (for instance, in *HyperTerminal* select Transfer/Send File...), use Xmodem as the transfer protocol, and select the firmware file. For example, *ptx.bin*.
8. Once the upload is complete the message *upload okay* is displayed.
9. Power off the PTX.
10. Set the PTX run/upgrade jumper to the run position.
11. Remove the serial adapter cable.
12. Power on the PTX.

7. VISTALINK® REMOTE MONITORING/CONTROL

7.1. WHAT IS VISTALINK®?

VistaLINK® is Evertz' remote monitoring and configuration platform which operates over an Ethernet network using Simple Network Management Protocol (SNMP). SNMP is a standard computer network protocol that enables different devices sharing the same network to communicate with each other. *VistaLINK®* provides centralized alarm management, which monitors, reports, and logs all incoming alarm events and dispatches alerts to all the VLPro Clients connected to the server. Card configuration through *VistaLINK®* PRO can be performed on an individual or multi-card basis using simple copy and paste routines, which reduces the time to configure each module separately. Finally, *VistaLINK®* enables the user to configure devices in the network from a central station and receive feedback that the configuration has been carried out.

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz *VistaLINK®-C* Configuration Utility graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *VistaLINK®* enabled products.
2. Managed devices, (such as 7700PTX modules), each with a unique address (OID), communicate with the NMS through an SNMP Agent. The 7700PTX-QUTZ communicates directly with the manager using its internal Agent.
3. A virtual database known as the Management Information Base (MIB) lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

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