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# REVISION HISTORY

| REVISION | DESCRIPTION | DATE |
|---|---|---|
| 1.0 | First document revision | Feb 05 |
| 1.1 | Minor corrections | Feb 05 |
| 1.2 | Additions for UMDs General cleanup | July 06 |
| 1.3 | Updated | Sept 06 |
| 1.4 | Added slave mode | Nov 06 |
| 1.5 | Standardized format | Feb 07 |
| 1.6 | Updated Card Edge drawing | Nov 07 |
| 1.7 | Added features, block diagram, technical specs and VistaLINK® section | Nov 08 |
| 1.8 | Removed references to GPI, GPO, LTC specifications | Apr 09 |
| 1.9 | 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 *Vista*LINK® 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 *Vista*LINK® to control third-party devices such as satellite controllers.

**Features:**
- 4 serial ports RS232/422 selectable
- Selectable +5V or +12V supply for driving GPI over longer cable runs
- Modular, conveniently fits into 7700FR-C 3RU frame
- Frame status trigger
- *Vista*LINK® - capable for remote monitoring and control via SNMP (using *Vista*LINK® PRO)

The 7700PTX-10XL is a protocol translator that can operate on a per port basis, in one of two modes:

1) Master mode
2) Slave mode

When in master mode the 7700PTX-10XL transmits requests to 10XL-based routers that are connected serially to the 7700PTX-10XL. The routers, which operate as slaves, send responses to the 7700PTX-10XL. Typically an SNMP manager provides the stimulus behind the request generation.

Figure 1-1 shows how the 7700PTX-10XL is typically set up for master mode.

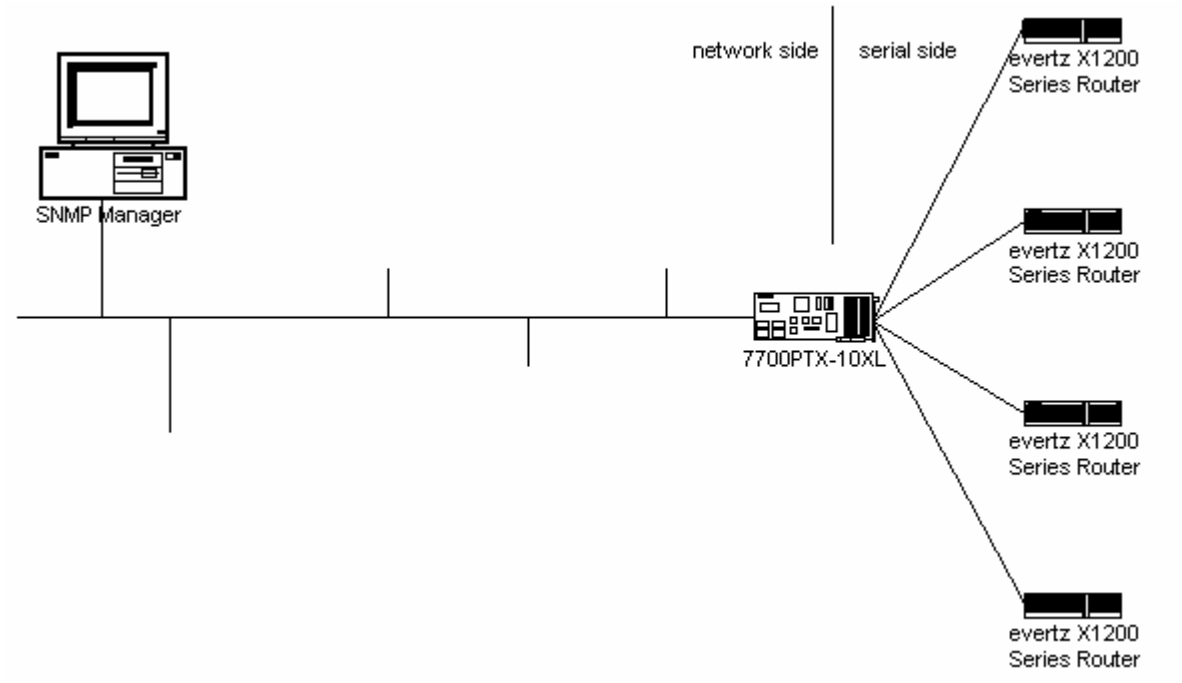



**Figure 1-1: Typical 7700PTX-10XL Master Mode Setup**

When in slave mode the 7700PTX-10XL receives 10XL protocol requests over a serial link from an external server. The 7700PTX-10XL transmits 10XL protocol responses to the server. The 7700PTX-10XL momentarily activates a GPO associated with the serial port. The GPO activation enables one of the two GPIs of a 7700R2X2-HES router causing a cross point change.

Figure 1-2 shows how the 7700PTX-10XL is typically set up for slave mode.

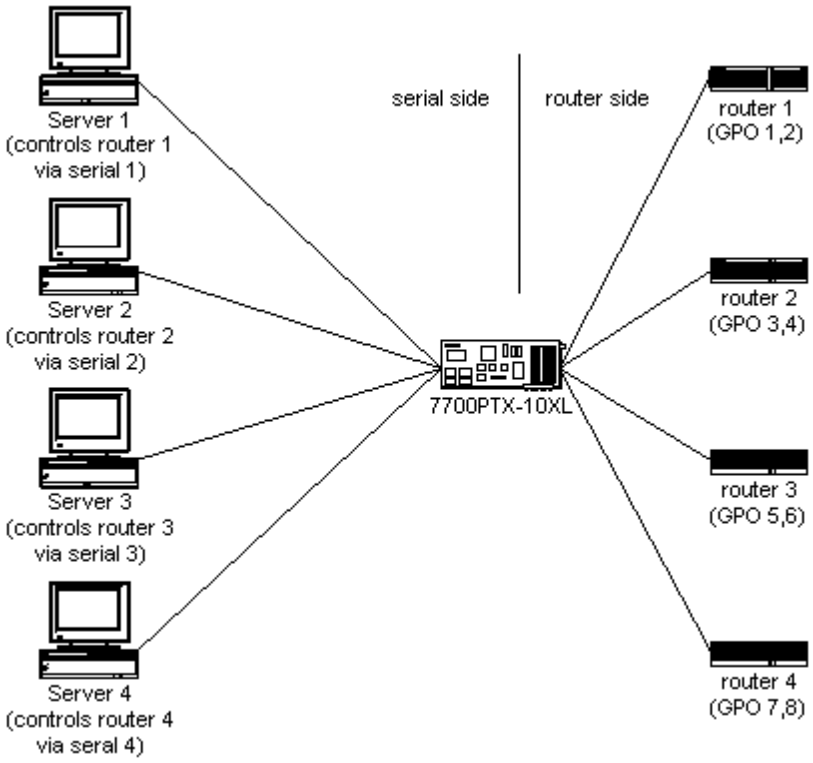



**Figure 1-2: Typical 7700PTX-10XL Slave Mode Setup**

# 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 is illuminated.

## 2.3. CARD EDGE LEDS

LED 22 is illuminated when Ethernet activity is detected.

All other card edge LEDs are for factory use only.

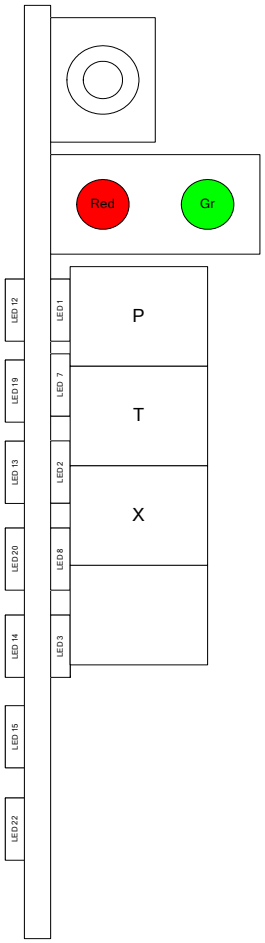



**Figure 2-1: PTX Card Edge**

# 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<br>EU EMC Directive |

## 3.3. PHYSICAL

| | |
|---|---|
| **Number of Slots:** | 2 |

# 4. CONFIGURATION

## 4.1. CONFIGURATION STEPS

### 4.1.1. Master Mode

Perform the following steps to configure the 7700PTX-10XL to operate in master mode:

1. Connect a PC running a console application to the PTX debug/monitor port via the adapter cable.
2. Configure the 7700PTX-10XL's network parameters.
3. Configure the parameters of each serial port to match those of the router(s).
4. Set the serial ports to operate in master mode.
5. Configure the number of inputs and outputs to match those of the router(s).
6. Configure the router input and output descriptions.
7. Set the serial address of each port to match that of the router(s).
8. If changes to the default settings are required configure the SNMP read and write community strings.
9. Configure UMD peers if required.
10. Save all configuration parameters.
11. Power off the 7700PTX-10XL.
12. Physically wire the serial port(s) of the 7700PTX-10XL to the router(s).
13. Power on the 7700PTX-10XL.

### 4.1.2. Slave Mode

Perform the following steps to configure the 7700PTX-10XL to operate in slave mode:

1. Connect a PC running a console application to the PTX debug/monitor port via the adapter cable.
2. Configure the 7700PTX-10XL's network parameters.
3. Configure the parameters of each serial port to match those of the server(s).
4. Set the serial ports to operate in slave mode.
5. Set the number of router inputs to 2.

6. Set the number of router outputs to 1.

7. Configure the router input and output descriptions.

8. Set the serial address of each port to match that of the server(s).

9. If changes to the default settings are required, configure the SNMP read and write community strings.

10. Configure UMD peers if required.

11. Save all configuration parameters.

12. Power off the 7700PTX-10XL.

13. Physically wire the serial port(s) of the 7700PTX-10XL to the server(s).

14. Connect GPO: COM to ground.

15. Connect the GPO NO (normally open) pins to the GPI pins of the 7700R2X2-HES router according to Table 4-5.

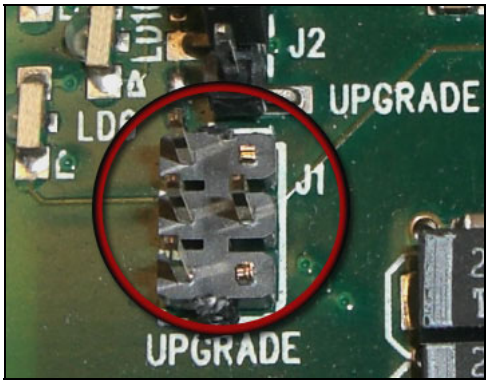
16. Power on the 7700PTX-10XL.

## 4.2. DEBUG/MONITOR PORT CONNECTION

The 7700PTX-10XL is configured via the debug/monitor port, the header of which is labeled J1. A special Evertz adapter cable allows this port to connect to the COM port of a personal computer. The following steps describe how to execute 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.




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. On the computer click “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 will open.


7. Select COM1 for the “Connect using’ setting. If COM1 is in use, choose an alternate COM port.

8. Press the <Enter> key or click OK. This causes the “COM Properties” window to open.

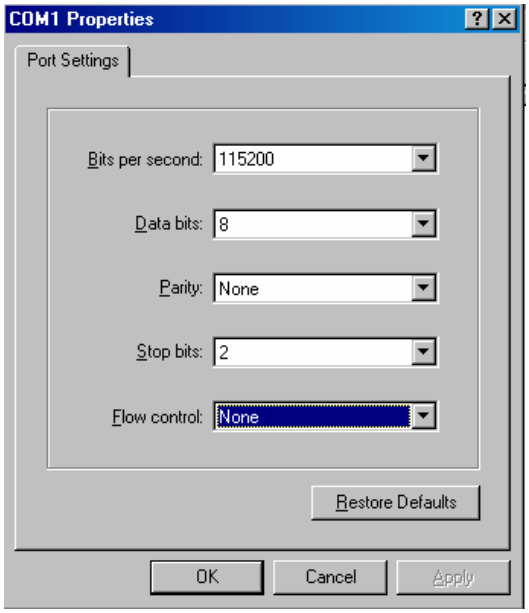



**Figure 4-1: COM1 Properties Window**

9. Enter the information as listed in Figure 4-1.

10. Press the <Enter> key or click OK. The “COM Properties” window closes, leaving the HyperTerminal window open.

11. Apply power to the 7700PTX-10XL if it has no power. The boot sequence and Main Menu are displayed in the HyperTerminal window.

12. If the 7700PTX-10XL has power, hit the <Enter> key to view the 7700PTX-10XL's menu system.

13. Various 7700PTX-10XL parameters are configurable via the 7700PTX-10XL'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-10XL'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 10XL router(s) or server(s) |
| **3** | **SNMP Setup** | IP address of SNMP manager(s) to receive traps |
| **4** | **10XL Protocol Settings Setup** | Settings specific to the 10XL 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-10XL 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-10XL must be rebooted for any network setting changes to take effect.**

## 4.5. SERIAL PORT SETUP

### 4.5.1. Parameters

The 7700PTX-10XL has 4 serial ports. The parameters associated with each serial port are listed in Table 4-2. When in master mode a serial port of the 7700PTX-10XL connects to and transmits requests to a 10XL router. When in slave mode a serial port of the 7700PTX-10XL connects to and receives requests from a server.

| 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-10XL must match those of the router(s) or server(s). The 7700PTX-10XL must be rebooted for any serial parameter changes to take effect.**

### 4.5.2. Back Plate

Figure 4-2 provides an illustration of the 7700PTX rear plate.

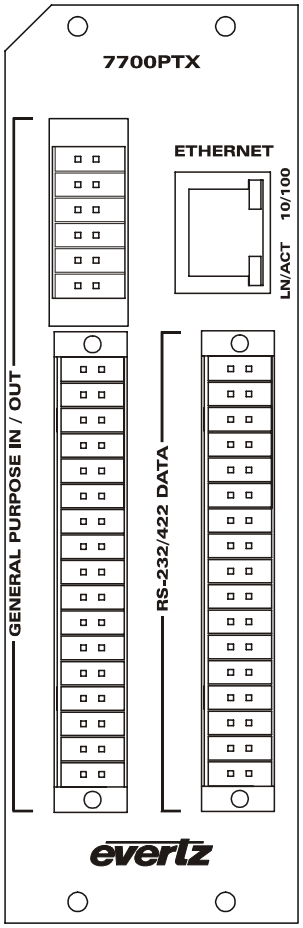



**Figure 4-2: 7700PTX Back Plate**

### 4.5.3. RS-232 Wiring

Figure 4-3 shows which pins of the rear plate are used for RS-232 serial connections.

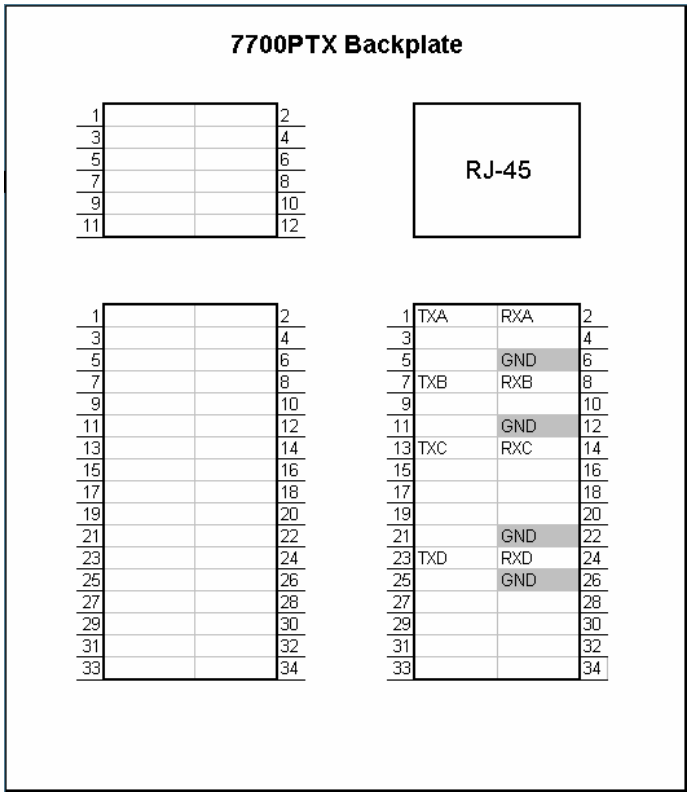



**Figure 4-3: RS-232 Pins**

Table 4-3 details how to connect the 7700PTX-10XL to the router or server for RS-232 operation.

| 7700PTX-10XL | | | Router/Server |
|---|---|---|---|
| **Port** | **Pin Name** | **Pin** | **Pin Name** |
| **1** | **TXA** | 1 | **RX** |
| | **RXA** | 2 | **TX** |
| | **GND** | 6 | **GND** |
| **2** | **TXB** | 7 | **RX** |
| | **RXB** | 8 | **TX** |
| | **GND** | 12 | **GND** |
| **3** | **TXC** | 13 | **RX** |
| | **RXC** | 14 | **TX** |
| | **GND** | 22 | **GND** |
| **4** | **TXD** | 23 | **RX** |
| | **RXD** | 24 | **TX** |
| | **GND** | 26 | **GND** |

**Table 4-3: RS-232 Wiring**

### 4.5.4. RS-422 Wiring

Figure 4-4 shows which pins of the rear plate are used for RS-422 serial connections.

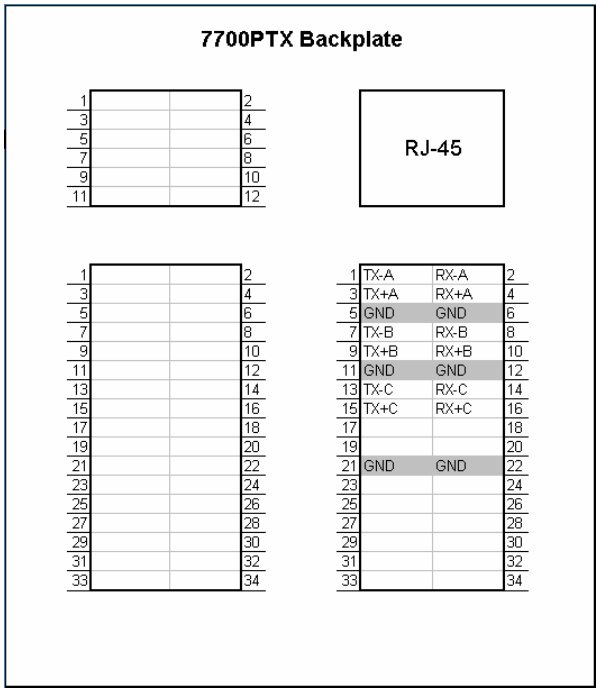



**Figure 4-4: RS-422 Pins**

Table 4-4 details how to connect the 7700PTX-10XL to the router or server for RS-422 operation.

| 7700PTX-10XL | | | Router/Server |
|---|---|---|---|
| **Port** | **Pin Name** | **Pin** | **Pin Name** |
| **1** | **TX-A** | 1 | **RX-** |
| | **TX+A** | 3 | **RX+** |
| | **RX-A** | 2 | **TX-** |
| | **RX+A** | 4 | **TX+** |
| | **GND** | 6 | **GND** |
| **2** | **TX-B** | 7 | **RX-** |
| | **TX+B** | 9 | **RX+** |
| | **RX-B** | 8 | **TX-** |
| | **RX+B** | 10 | **TX+** |
| | **GND** | 12 | **GND** |
| **3** | **TX-C** | 13 | **RX-** |
| | **TX+C** | 15 | **RX+** |
| | **RX-C** | 14 | **TX-** |
| | **RX+C** | 16 | **TX+** |
| | **GND** | 22 | **GND** |

**Table 4-4: RS-422 Wiring**

**The 7700PTX-10XL's 4th serial port is not RS-422 capable.**

### 4.5.5. GPO Common Pin Wiring

When operating any of the serial ports in slave mode, the GPO common pin (Pin 13) must be connected to ground (GND, Pin14) as shown in Figure 4-5.

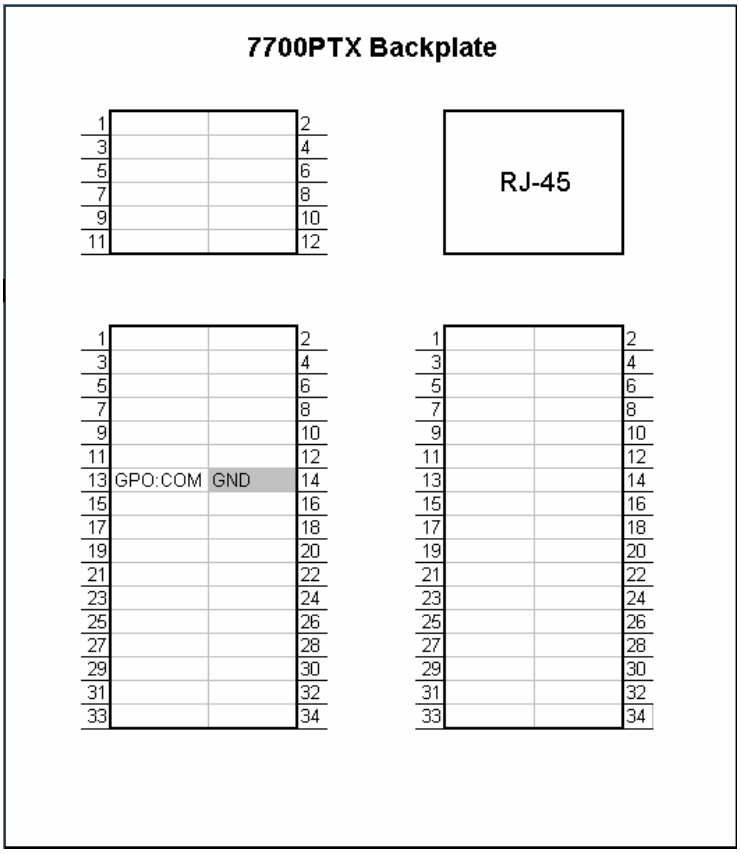



**Figure 4-5: GPO Comm For Slave Mode**

### 4.5.6. GPO to GPI Wiring

Table 4-5 details how to connect, when operating in slave mode, the 7700PTX-10XL to the 7700R2x2-HES routers.

| 7700PTX Back Plate Pin | GPO Normally Open (NO) Pin | 7700PTX-10XL Serial Port | 7700R2X2-HES Router | 7700R2X2-HES GPI Pin |
|---|---|---|---|---|
| 17 | 1 | 1 | 1 | 1 |
| 18 | 2 | | | 2 |
| 21 | 3 | 2 | 2 | 1 |
| 22 | 4 | | | 2 |
| 27 | 5 | 3 | 3 | 1 |
| 28 | 6 | | | 2 |
| 31 | 7 | 4 | 4 | 1 |
| 32 | 8 | | | 2 |

**Table 4-5: GPO to GPI Wiring**

## 4.6. SNMP SETUP

Table 4-6 lists the parameters associated with the SNMP setup.

| Parameter | Notes |
|---|---|
| **Read-only community** | Community string used for SNMP gets. The default is *public*. |
| **Read-write community** | Community string used for SNMP gets or sets. The default is *private*. |

**Table 4-6: SNMP Parameters**

**These parameters must match those of the SNMP manager. Changes to these parameters do not require a reboot of the 7700PTX-10XL.**

## 4.7. 10XL PROTOCOL CONFIGURATION

**Changes to any of these parameters do not require a reboot of the 7700PTX-10XL.**

### 4.7.1. Master Mode

Follow the steps below to switch serial port 1 of the 7700PTX-10XL into master mode:

1. From the *Main Menu* select *10XL Protocol Settings Setup*.
2. Select *10XL Protocol Setup For Serial Port 1*.
3. Select *Set mode*.
4. Select *Master*.

### 4.7.2. Slave Mode

Follow the steps below to switch serial port 1 of the 7700PTX-10XL into slave mode:

1. From the *Main Menu* select *10XL Protocol Settings Setup*.
2. Select *10XL Protocol Setup For Serial Port 1*.
3. Select *Set mode*.
4. Select *Slave*.

### 4.7.3. Number of Router Inputs

Follow the steps below to set the number of inputs for the router associated with serial port 1 of the 7700PTX-10XL:

1. From the *Main Menu* select *10XL Protocol Settings Setup*.
2. Select *10XL Protocol Setup For Serial Port 1*.
3. Select *Set number of router inputs*.
4. Enter the number of router inputs.

### 4.7.4. Number of Router Outputs

To set the number of outputs for the router associated with serial port 1 of the 7700PTX-10XL, follow the steps below:

1. From the *Main Menu* select *10XL Protocol Settings Setup*.
2. Select *10XL Protocol Setup For Serial Port 1*.
3. Select *Set number of router outputs*.
4. Enter the number of router outputs.

### 4.7.5. Input & Output Descriptions

The textual descriptions of the inputs and outputs for the router associated with serial port 1 of the 7700PTX-10XL must be manually set. This can be accomplished by:

- Using VistaLINK® Pro
- Using the 7700PTX-10XL's *10XL Protocol Settings Setup* menu

To configure the descriptions from the console, follow the steps outlined below:

1. From the *Main Menu* select *10XL Protocol Settings Setup*.
2. Select *10XL Protocol Setup For Serial Port 1*.
3. Select *Set input description*.
4. Enter the input number 1 and its description.
5. Repeat steps 2 & 3 for the remaining inputs.
6. Select *Set output description.*
7. Enter the output number 1 and its description.
8. Repeat steps 5 & 6 for the remaining outputs.

### 4.7.6. Serial Address

The 10XL serial address must be the same at both the master and the slave side. To set the serial address for serial port 1 of the 7700PTX-10XL, follow the steps outlined below:

1. From the *Main Menu* select *10XL Protocol Settings Setup*.
2. Select *10XL Protocol Setup For Serial Port 1*.
3. Select *Set serial address*.
4. Enter the matching serial address.

### 4.7.7. Power On Reset Router Initialization

When operating in master mode, set this parameter to *Yes* **ONLY** if the connected router loses its cross points when its power is cycled. Since virtually all routers do not, this field should be left as *No*.

### 4.7.8. Save & Exit

To save the 10XL protocol configuration settings, select *Save & Exit* prior to returning to the *Main Menu*.

## 4.8. UNDER MONITOR DISPLAY SETUP

The 7700PTX-10XL 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 4-6:

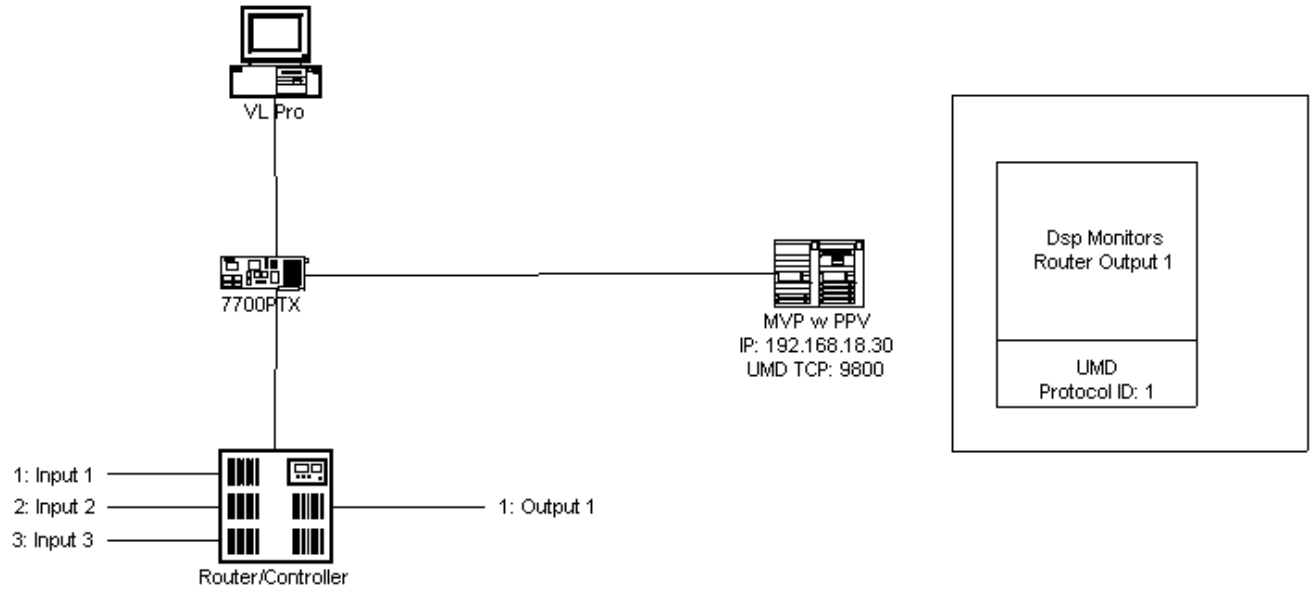



**Figure 4-6: UMD Example**

Where:

- A router has 3 inputs connected (labeled *Input 1*, *Input 2*, and *Input 3*) and 1 output (labeled *Output 1*)
- A 7700PTX-10XL 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 TCP (TCP port is configured to be 9800)
- The PPV drives a single display monitoring router Output 1; the display contains a UMD with a protocol ID (PID) set to 1
- A PC running VistaLINK® Pro configures the 7700PTX-10XL so that the UMD PID associated with router Output 1 matches the PID of the UMD (ie. 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-10XL 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-10XL must be rebooted for any UMD peer changes to take effect.**

# 5. TROUBLESHOOTING TIPS

## 5.1. VLPRO NOTES

1. The 7700PTX-10XL must be able to communicate with any connected routers in order for VLPro to operate properly.

2. The 7700PTX-10XL 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-10XL is actively communicating with the router on that port. If the state is consistently reported as *down,* then the 7700PTX-10XL 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-10XL, in master mode, is able to communicate with a router connected to port 2.

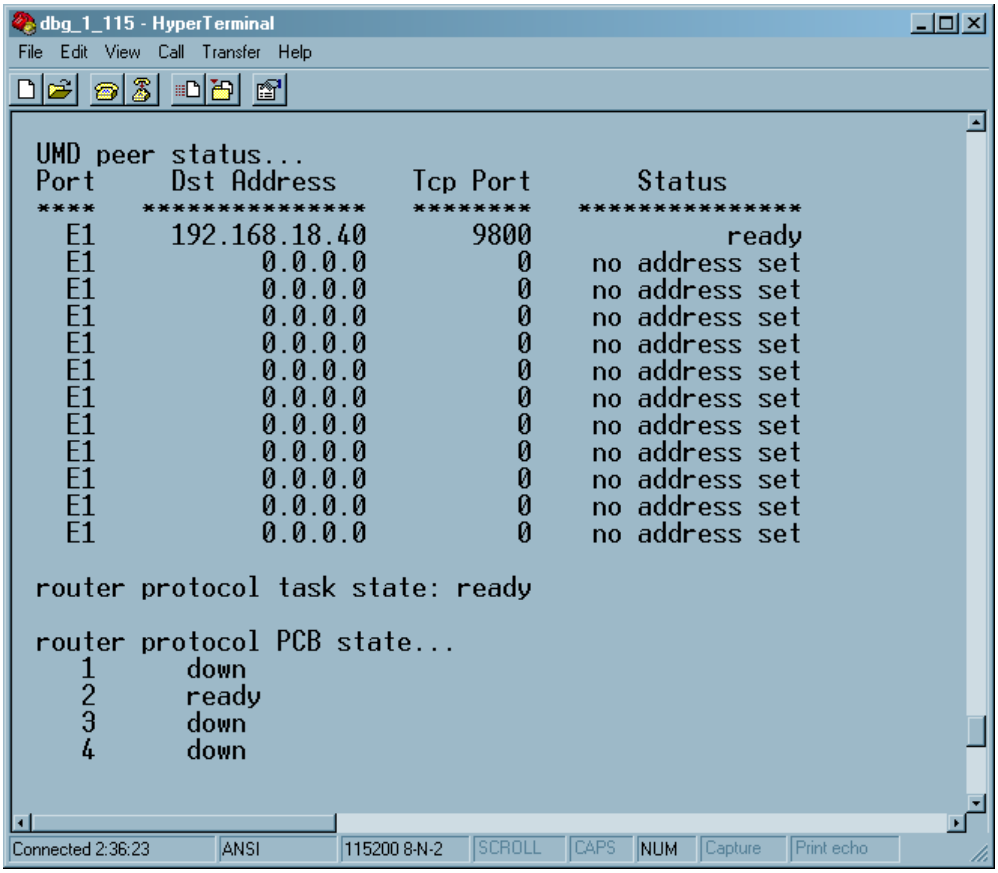



**Figure 5-1: Communication States**

## 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 are listed under the heading *UMD peer status…* A status reported as *ready* indicates the 7700PTX-10XL is able to communicate with that UMD peer. A status consistently reported as something other than ready indicates the inability of the 7700PTX-10XL 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 the 7700PTX-10XL is able to communicate with the UMD peer whose IP address is 192.168.18.40 and is listening on TCP port 9800.

## 5.4. ROUTER POLLING

By default, as a master the 7700PTX-10XL polls each router at 30-second intervals. A poll consists of a 10XL read or query request packet addressed to each router output.

The polling mechanism detects changes in router status (ie. active/inactive) as well as changes to the router cross-points. A change in router status results in an SNMP trap being sent to any configured trap hosts.

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.

Regardless of the router poll setting, upon power-on the 7700PTX-10XL transmits a single poll request to each serial port to determine initial router activity status. Once set, the router poll status setting is saved to flash and no reboot is required.

# 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. *VISTA*LINK® REMOTE MONITORING/CONTROL

## 7.1. WHAT IS *VISTA*LINK®?

*Vista*LINK® 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. *Vista*LINK® 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 *Vista*LINK® 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, *Vista*LINK® 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 *Vista*LINK®-C Configuration Utility graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz *Vista*LINK® 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-10XL 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.