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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Apr 07
1.1	Added information on source name offset and VGPI transmission	Oct 07
1.2	Updated card edge drawing	Nov 07
1.3	Updated Preview VGPI Offset information	Apr 08
1.4	Added features, block diagram, technical specs and VistaLINK section. Updated CTP protocol setup.	Nov 08
1.5	Removed references to GPI, GPO, LTC specifications	Apr 09
1.6	Removed block diagram	Nov 09

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
- 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-CTP is a protocol translator that can accept, on any of its 4 serial ports, the Contribution Tally Protocol.

The typical environment, as Figure 1-1 shows, has the 7700PTX-CTP connecting to a switcher. The 7700PTX-CTP, in turn, communicates with a MVP via a TCP link.

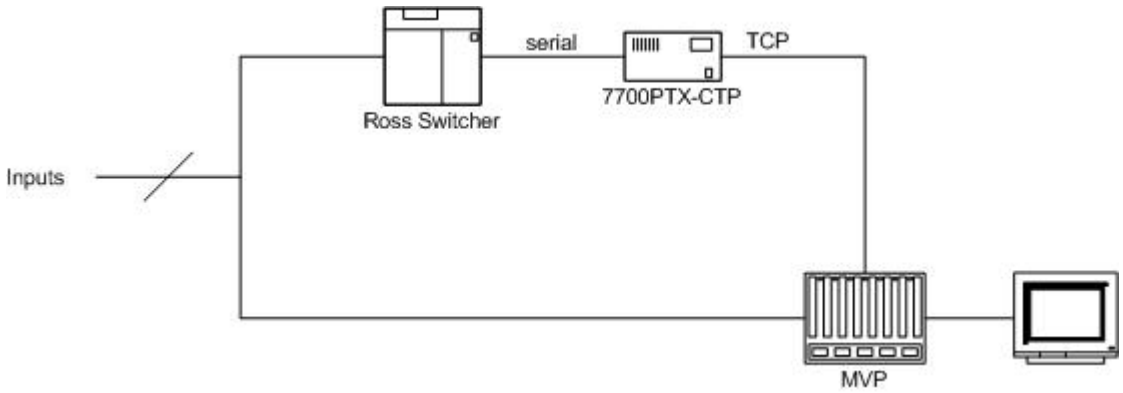

Figure 1-1: Typical 7700PTX-CTP Setup

The function of the 7700PTX-CTP is to monitor the Contribution Tally Protocol to:

1. Determine which, if any, of the switcher's inputs is contributing to the switcher's program output. This is represented by the 7700PTX-CTP as a collection of virtual GPIs and conveyed via TCP to the display card(s) of an MVP.

2. Determine which, if any, of the switcher's inputs is contributing to the switcher's preview output. This is represented by the 7700PTX-CTP as a collection of virtual GPIs and conveyed via TCP to the display card(s) of an MVP.

3. Determine the names of the switcher's inputs/sources and convey them via TCP to the display card(s) of an MVP.

As an example, suppose:

1. 12 video sources are supplied to inputs 1 – 12 of the switcher.

2. A MVP is monitoring these sources.

3. A 7700PTX-CTP communicates with the switcher via a RS-422 link.

4. The 7700PTX-CTP communicates with the display card of the MVP via TCP.

5. The MVP's output card display matches that of Figure 1-2 where each input has associated with it a program tally, a preview tally, and a UMD.

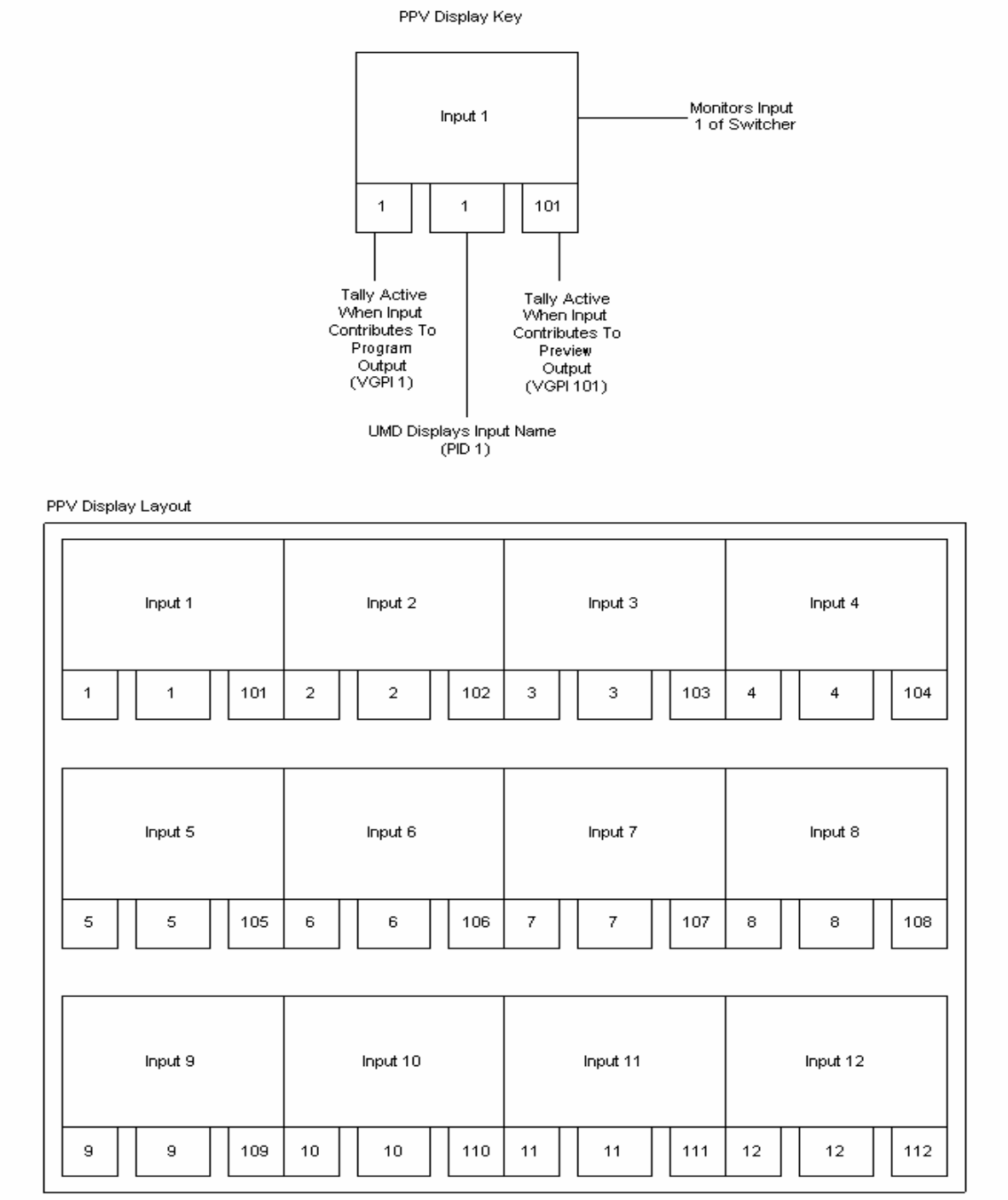

Figure 1-2: 7700PTX-CTP Example

The names of the switcher inputs will appear on the UMD located beneath each display window. If the input contributes to the program output the tally on the left will be active. If the input contributes to the preview output the tally on the right will be active.

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.

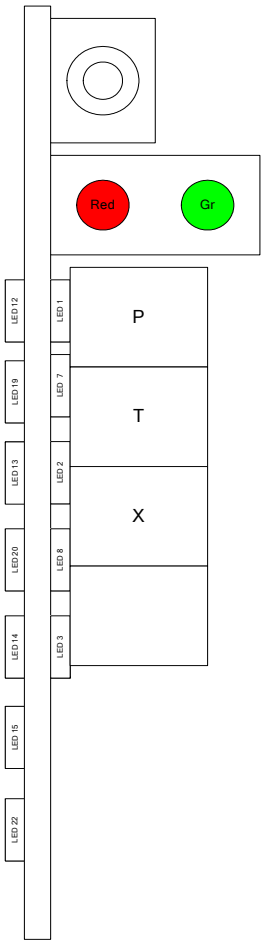

Figure 2-1: PTX Card Edge

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
EU EMC Directive

3.3. PHYSICAL

Number of Slots: 2

4. CONFIGURATION

4.1. CONFIGURATION STEPS

The basic steps required to configure the 7700PTX-CTP are as follows:

1. Connect a PC running a console application to the PTX debug/monitor port via the adapter cable.
2. Configure the network parameters of the 7700PTX-CTP.
3. Configure the parameters of each serial port to match those of the connected switcher.
4. Configure the CTP protocol parameters should changes to the defaults be required.
5. Configure the IP address and TCP port of the UMD peer(s).
6. Save all configuration parameters.
7. Power off the 7700PTX-CTP.
8. Physically wire the serial port(s) of the 7700PTX-CTP to the switcher.
9. Power on the 7700PTX-CTP.

4.2. DEBUG/MONITOR PORT CONNECTION

The 7700PTX-CTP 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 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.

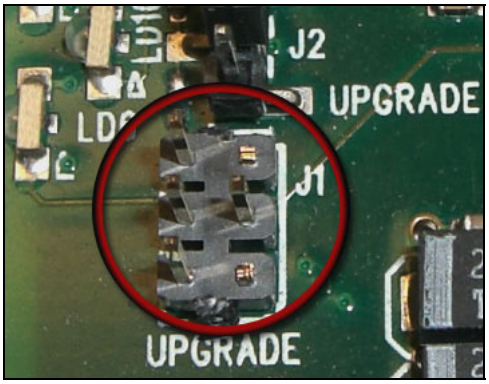

Figure 4-1: Upgrade Jumper

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.

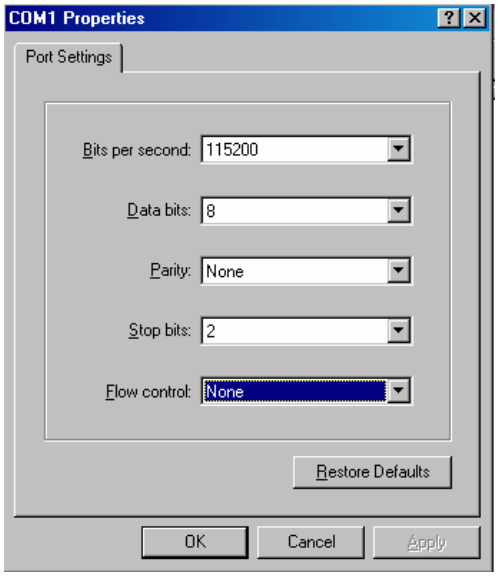

Figure 4-3: COM1 Properties

9. Enter the information as listed in the screen above.

10. Press the <Enter> key or select OK. The "*COM Properties*" window closes, leaving the HyperTerminal window open.

11. Apply power if the 7700PTX-CTP does not have power. The boot sequence and *Main Menu* are displayed in the HyperTerminal window.

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

13. Various 7700PTX-CTP parameters are configurable via the 7700PTX-CTP's menu system, the root of which is called *Main Menu*.

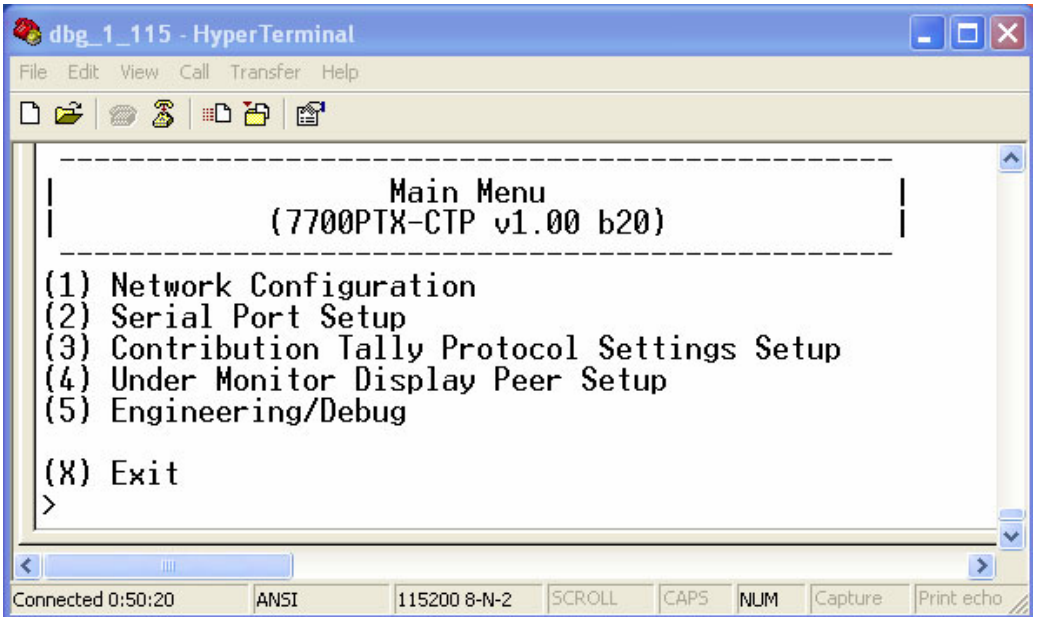

Figure 4-4: HyperTerminal Main Menu

4.3. MAIN MENU

Table 4-1 lists the entries available in the 7700PTX-CTP'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 that are connected to the switcher.
3	**Contribution Tally Protocol Settings Setup**	Parameters pertaining to the Contribution Tally Protocol.
4	**Under Monitor Display Setup**	IP address and TCP port of UMD peers.
5	**Engineering/Debug**	Used for troubleshooting.

Table 4-1: 7700PTX-CTP 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-CTP must be rebooted for any network setting changes to take effect.

4.5. SERIAL PORT SETUP

4.5.1. Parameters

The 7700PTX-CTP has 4 serial ports. The parameters associated with each serial port are listed in Table 4-2.

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

Typically the switcher uses 8 data bits, no parity, and 1 stop bit. The highest baud rate supported by both the switcher and 7700PTX-CTP should be used (typically 115200).

The serial port settings of the 7700PTX-CTP must match those of the switcher. The 7700PTX-CTP must be rebooted for any serial parameter changes to take effect.

4.5.2. Rear Plate

Figure 4-5 provides an illustration of the 7700PTX rear plate.

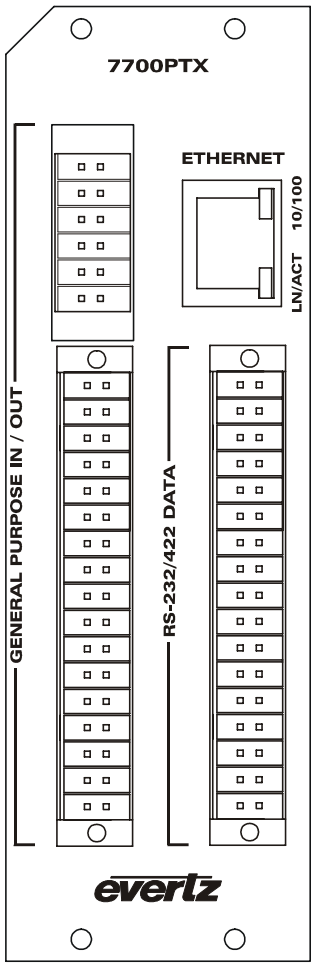

Figure 4-5: 7700PTX Rear Plate

4.5.3. RS-232 Wiring

Figure 4-6 shows which pins of the back plate are used for RS-232 serial connections.

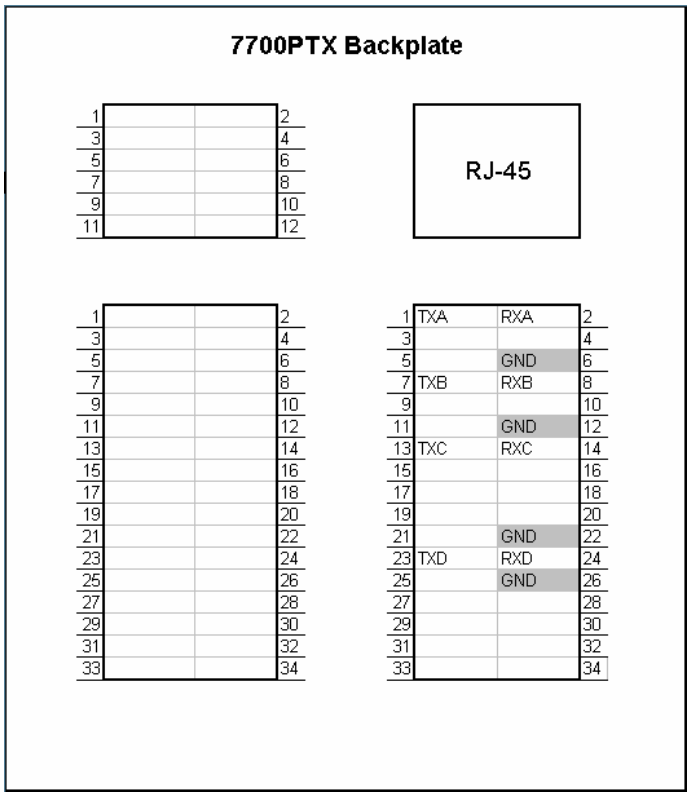

Figure 4-6: RS-232 Pins

Table 4-3 outlines how to connect the 7700PTX-CTP to the switcher for RS-232 operation.

7700PTX-CTP			Switcher
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 4-7 displays which pins of the back plate are used for RS-422 serial connections.

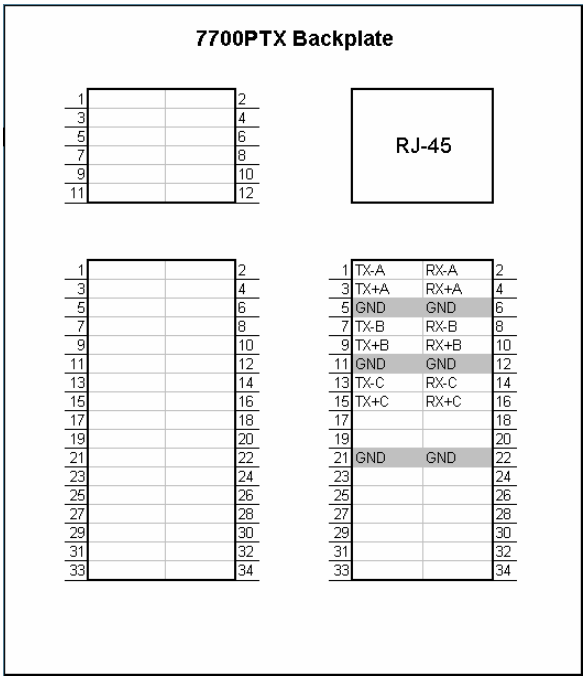

Figure 4-7: RS-422 Pins

Table 4-4 outlines how to connect the 7700PTX-CTP to the CTP switcher for RS-422 operation.

7700PTX-CTP			Switcher
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-CTP's fourth serial port is not RS-422 capable.

4.6. CTP PROTOCOL SETUP

```
 ------------------------------------------------
|          CTP Setup For Serial Port 1           |
|            (7700PTX-CTP v1.00 b67)             |
 ------------------------------------------------
 ------------------------------------------------
         VGPI Image Video Dsp Id:   500
              VGPI Refresh Count:   750

            Program Output Number:   5
              Program VGPI Offset:   0
                   Tx Program UMD:   n
                Program UMD Dsp Id:   129

            Preview Output Number:   6
              Preview VGPI Offset:   100
                   Tx Preview UMD:   n
                Preview UMD Dsp Id:   130

                   Tx Source Names:   y
         Src Names Refresh Count:   750
         Src Names Dsp Id Offset:   0

     Include Non-Physical Sources
     with VPGIs and Source Names:   n
 ------------------------------------------------
(1) Set VGPI image video display Id
(2) Set VGPI refresh count
(3) Set the program output number
(4) Set the program VGPI offset
(5) Enable/disable program UMD transmission
(6) Set program UMD display Id
(7) Set the preview output number
(8) Set the preview VGPI offset
(9) Enable/disable preview UMD transmission
(10) Set preview UMD display Id
(11) Enable/disable source name transmission
(12) Set source names refresh count
(13) Set source names display Id offset
(14) Include non-physical sources with VGPIs and source names

(S) Save and Exit
(X) Exit
>
```

Figure 4-8: CTP Protocol Parameters

The 7700PTX-CTP must be rebooted for any CTP protocol parameter changes to take effect.

4.6.1. VGPI Image Video Display Id

This value is used for the transport of the VGPI data. A value should be selected that does not conflict with another display ID.

4.6.2. VGPI Refresh Count

The switcher sends tally information to the 7700PTX-CTP on a continuous and repetitive basis, even in the absence of changes to this tally information.

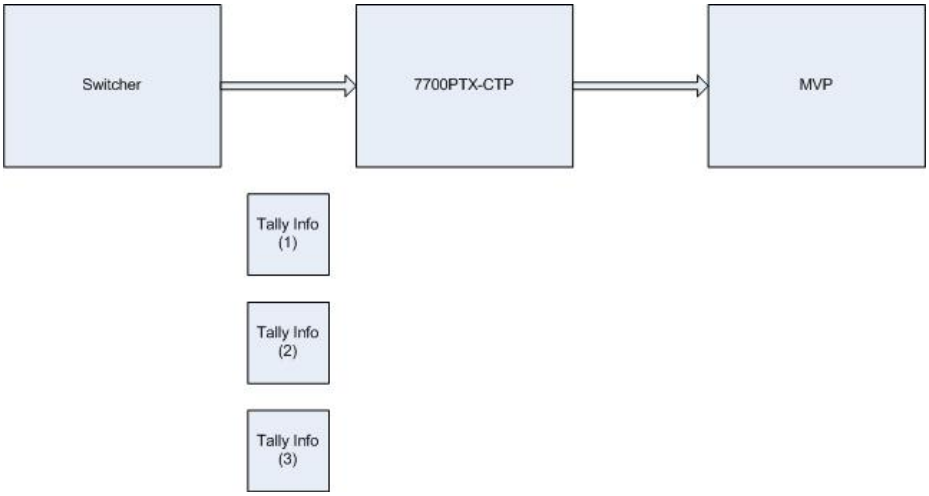

Figure 4-9: Tally Info Transmission

The VGPI refresh count parameter specifies how many iterations of non-changing tally information the 7700PTX-CTP receives before it provides a VGPI refresh to the MVP. For instance, if the VGPI refresh count is set to 750 it means the 7700PTX-CTP will receive the unchanging tally information 750 times before it sends a VGPI refresh to the MVP. The VGPI refresh is beneficial should the MVP lose power.

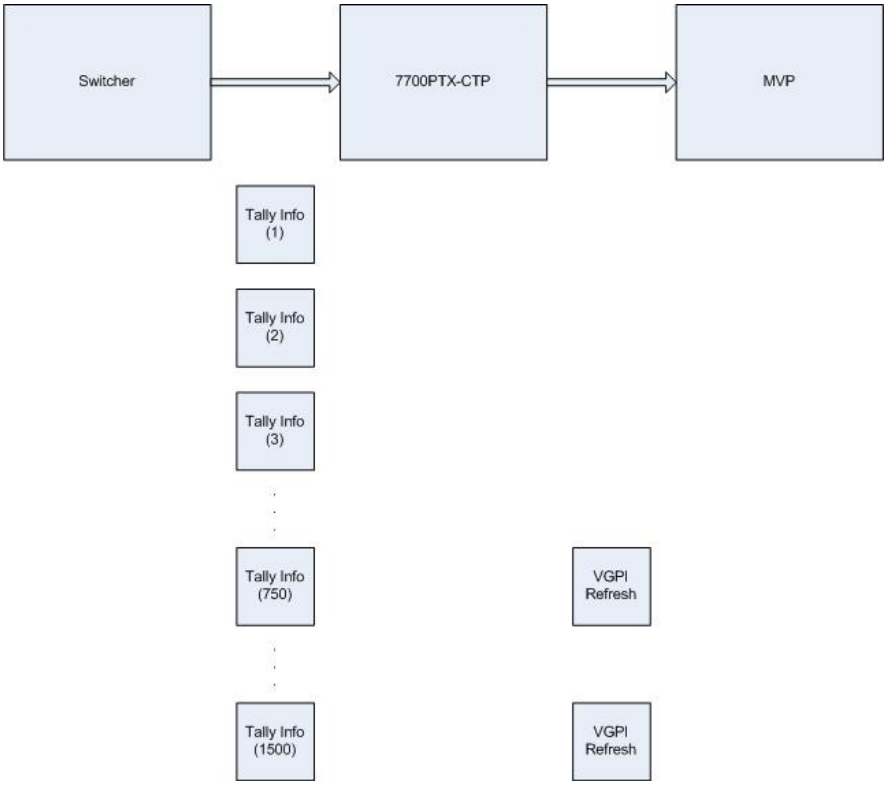

Figure 4-10: VGPI Refresh

4.6.3. Program Output Number

This parameter represents the output of the switcher that corresponds to the program output. The default for this parameter is 5.

4.6.4. Program VGPI Offset

This is the value added to the switcher's source number to obtain the program VGPI number that the 7700PTX-CTP transmits to the PPV(s). Table 4-5 shows the default offset (0) as well as a user-defined offset (1). Selecting an offset of –1 will disable the transmission of the program VGPIs.

CTP Source Number	Offset = 0, VGPI Number	Offset = 1, VGPI Number
1	1	2
2	2	3
3	3	4
4	4	5
5	5	6
. **.** **.**	. . .	. . .
88	88	89
89	89	90
90	90	91
91	91	92
92	92	93

Table 4-5: CTP Source Number to Program VGPI Mapping

Setting the program VGPI offset to –1 disables the transmission of the program VGPIs.

4.6.5. Tx Program UMD

Suppose the switcher's program output is being monitored by a display window of the MVP.

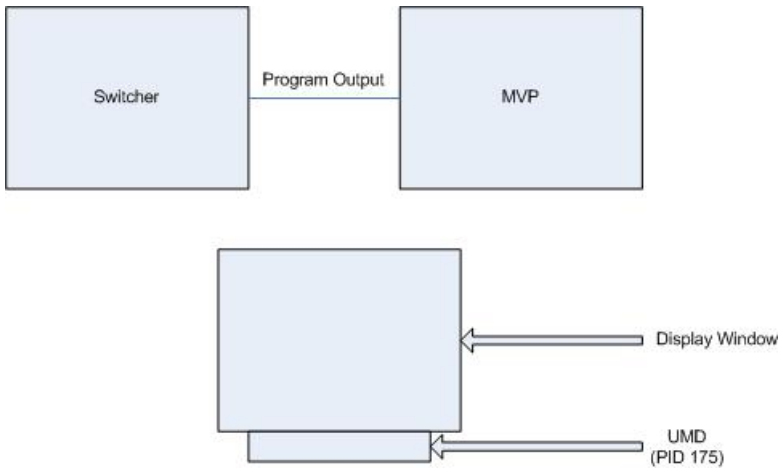

Figure 4-11: Program UMD

The display window can have a UMD associated with it. When the Tx Program UMD parameter is set to ***yes***, the 7700PTX-CTP will transmit the name(s) of the switcher source(s) contributing to the program output.

4.6.6. Program UMD Display Id

This parameter should match the protocol ID of the UMD displaying the names of switcher source(s) contributing to the program output. For the example of Figure 4-11, the program UMD display ID would be set to 175.

4.6.7. Preview Output Number

This parameter is the output of the switcher that corresponds to the preview output. The default for this parameter is 6.

4.6.8. Preview VGPI Offset

This is the value added to the switcher's source number to obtain the preview VGPI number that the 7700PTX-CTP transmits to the PPV(s). Table 4-6 shows the default offset (100) as well as a user-defined offset (101). Selecting an offset of –1 will disable the transmission of the preview VGPIs.

CTP Source Number	Offset = 100, VGPI Number	Offset = 101, VGPI Number
1	101	102
2	102	103
3	103	104
4	104	105
5	105	106
. **.** **.**	. . .	. . .
88	188	189
89	189	190
90	190	191
91	191	192
92	192	193

Table 4-6: CTP Source Number to Preview VGPI Mapping

Setting the preview VGPI offset to –1 disables the transmission of preview VGPIs.

4.6.9. Tx Preview UMD

Suppose the switcher's preview output is being monitored by a display window of the MVP.

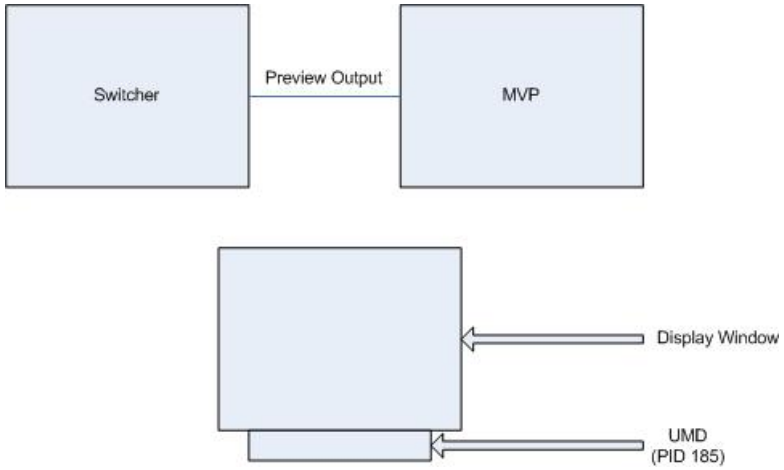

Figure 4-12: Preview UMD

The display window can have a UMD associated with it. When the Tx Preview UMD parameter is set to ***yes***, the 7700PTX-CTP will transmit the name(s) of the switcher source(s) contributing to the preview output.

4.6.10. Preview UMD Display Id

This parameter should match the protocol ID of the UMD displaying the names of switcher source(s) contributing to the preview output. For the example of Figure 4-12, the preview UMD display ID would be set to 185.

4.6.11. Transmit Source Names

By default, the 7700PTX-CTP will transmit the names of sources provided by the switcher. Please note that the switcher must be configured to transmit these names to the 7700PTX-CTP in order for the 7700PTX-CTP to forward them to the PPV(s).

4.6.12. Source Names Refresh Count

If it is configured to do so, the switcher sends the name of its sources to the 7700PTX-CTP on a continuous and repetitive basis, even in the absence of changes to these names. This parameter specifies the maximum number of times, in the absence of any changes, the 7700PTX-CTP will receive a cycle of CTP source name messages before it provides an update to the MVP.

4.6.13. Source Names Display ID Offset

This is the value added to the switcher's source number to obtain the UMD display ID that the 7700PTX-CTP transmits to the PPV(s). Table 4-7 shows how the display IDs are given offsets of 0 and 101.

CTP Source Number	Offset = 0, Display ID	Offset = 101, Display ID
1	1	102
2	2	103
3	3	104
4	4	105
5	5	106
. **.** **.**	. . .	. . .
88	88	189
89	89	190
90	90	191
91	91	192
92	92	193

Table 4-7: CTP Source Number to Display ID Mapping

Thus, if we have an offset of 0, we would want to create the layout shown in Figure 4-13 to display the names of the first 12 sources.

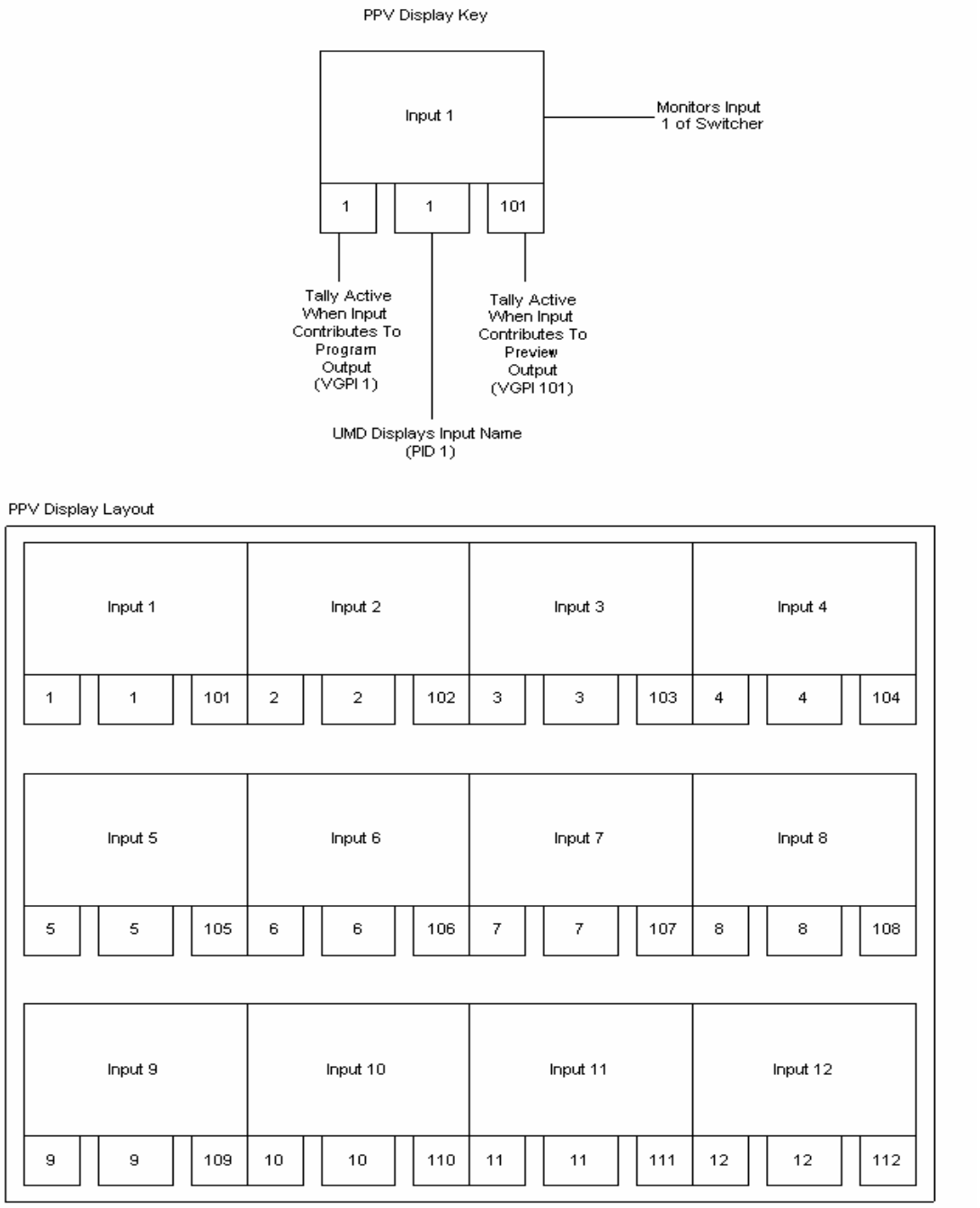

Figure 4-13: Example Display Layout for Source Names

In summary:

Source Display ID = (CTP Source Number) + (Source Names Display ID Offset)

A UMD with:

Protocol ID = Source Display ID

This will display the source.

4.6.14. Include Non-Physical Sources with VGPIs and Source Names

Switcher sources 1 – 92 correspond to the physical or external switcher inputs. Switcher sources 93 – 128 correspond to non-physical or internal switcher inputs. This parameter controls whether or not the non-physical sources are included with the VGPI and source name data sent by the 7700PTX-CTP to the PPV(s).

4.7. UNDER MONITOR DISPLAY SETUP

Suppose we have the setup of Figure 4-14.

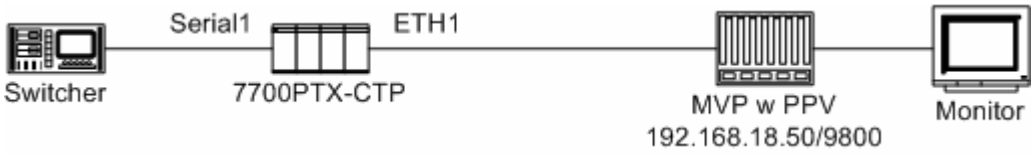

Figure 4-14: UMD Peer Configuration

The 7700PTX-CTP is used to communicate with the PPV using the IP address 192.168.18.50 which is listening for the UMD image video protocol data over TCP port 9800. To configure the 7700PTX-CTP:

1. From the *Main Menu* select *Under Monitor Display Peer Setup*.
2. Select *UMD Peer Setup via Ethernet 1*.
3. Select the appropriate peer number 1 – 12 (the PTX-CTP can communicate with up to 12 PPVs).
4. Enter the IP address (192.168.18.50) and TCP port (9800) of the UMD peer.
5. Select *Save and Exit*.
6. Repeat steps 4 and 5 for each PPV.

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

5. TROUBLESHOOTING TIPS

5.1. CHECKING SWITCHER COMMUNICATION

1. From the *Main Menu* select *Engineering/Debug*.

2. Select *Show task statistics*.

3. There are four entries, one for each serial port, listed under the heading *incoming serial port statistics…* If the item *in chars* is reported as a non-zero hexadecimal value then the 7700PTX-CTP is receiving data from the switcher. If it is consistently reported as 0x00000000 then the 7700PTX-CTP is not receiving data from the switcher. In this case the serial settings or wiring may be incorrect or the switcher may not be configured properly.

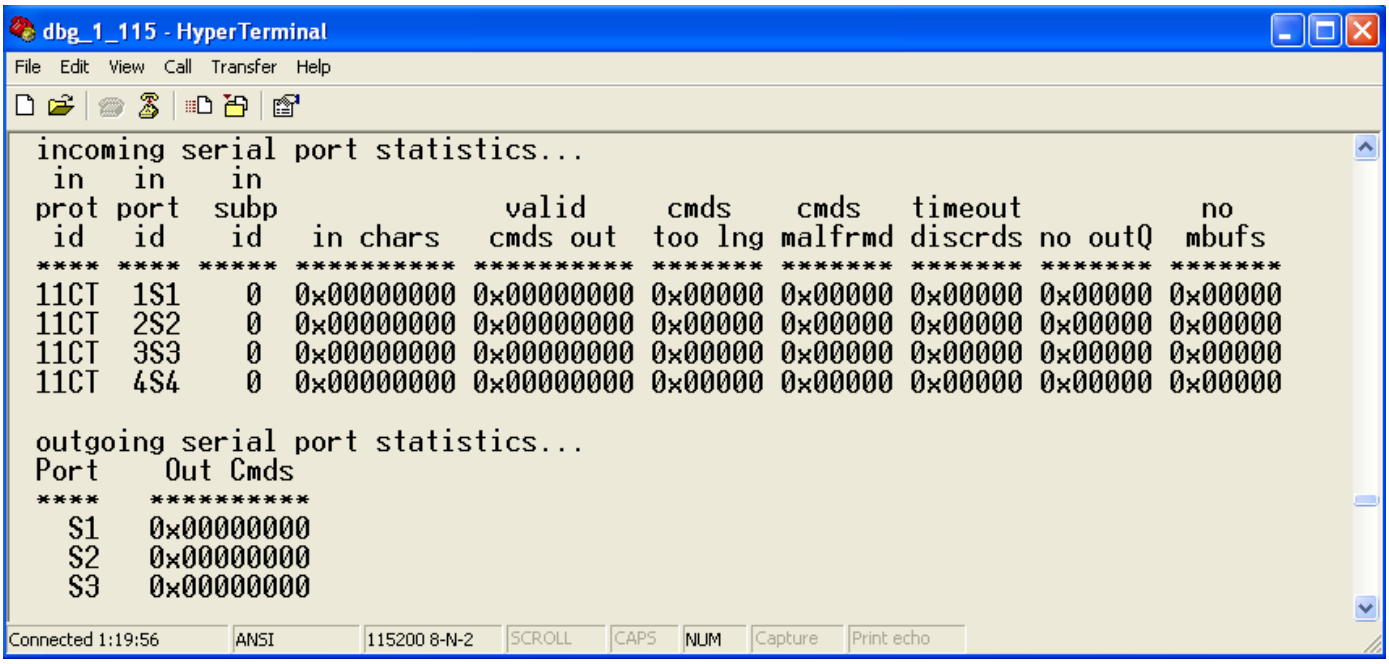

Figure 5-1: CTP Status

5.2. CHECKING UMD COMMUNICATION

1. From the *Main Menu* select *Engineering/Debug*.

2. Select *Show task state*.

3. There are up to 12 UMD peer entries listed under the heading *UMD peer status…* A status reported as *ready* indicates the 7700PTX-CTP is able to communicate with that UMD peer. A status consistently reported as something other than ready indicates the inability of the 7700PTX-CTP 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 5-2 shows that the 7700PTX-CTP is able to communicate with the UMD peer whose IP address is 192.168.18.40 and who is listening on TCP port 9800.

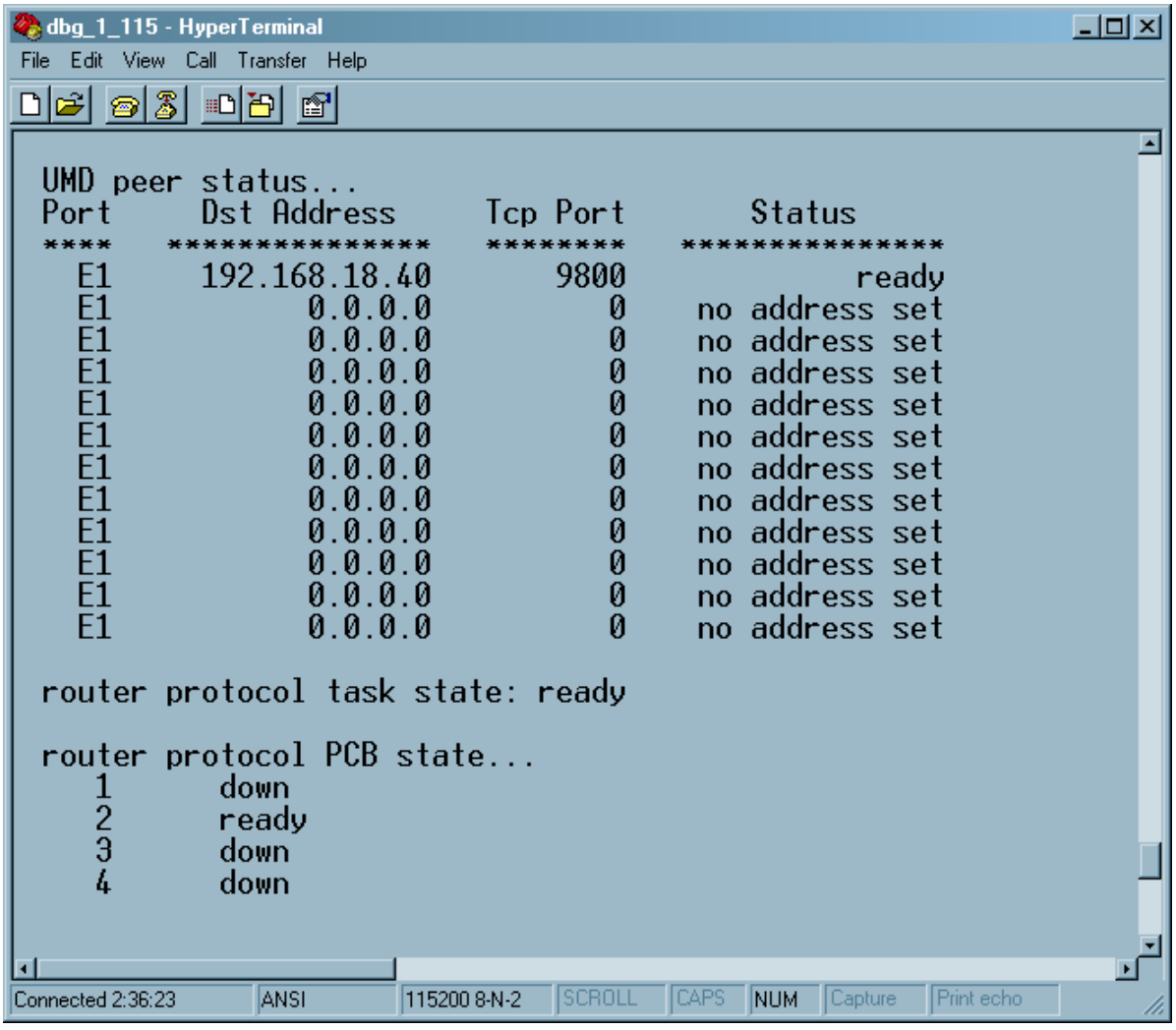

Figure 5-2: UMD Peer Status

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-CTP 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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