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REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	Preliminary	Sept 05
1.1	Standardized Format	Mar 07
1.2	Updated card edge drawing	Nov 07
1.3	Added features, block diagram, technical specs & *Vista*LINK® 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 *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-NV is a network-controlled protocol translator that translates SNMP commands into either NVision Serial Protocol (NVSP) packets that are transmitted to one of up to four NVision routers; or NV9000 protocol packets that are transmitted to an NVision server.

Figure 1-1 shows how the 7700PTX-NV is typically set up for serial communication.

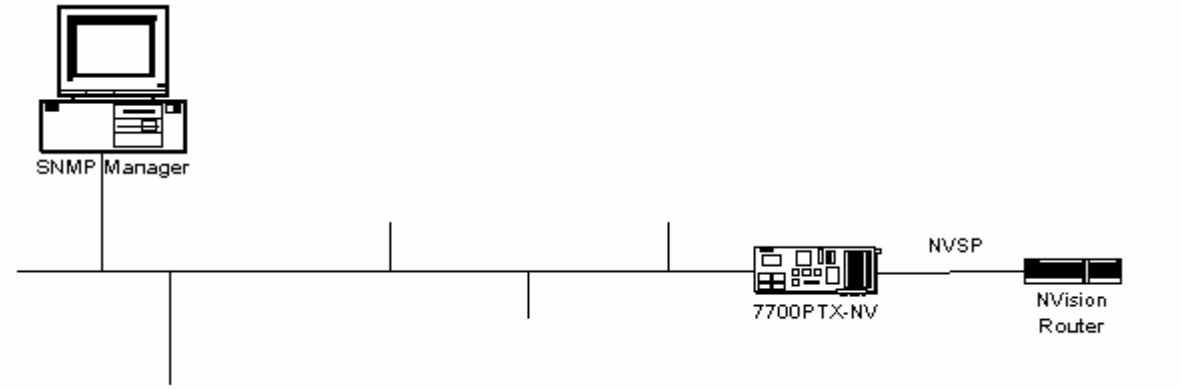

Figure 1-1: Typical 7700PTX-NV Serial Setup

Figure 1-2 shows how the 7700PTX-NV is typically set up for Ethernet communication.

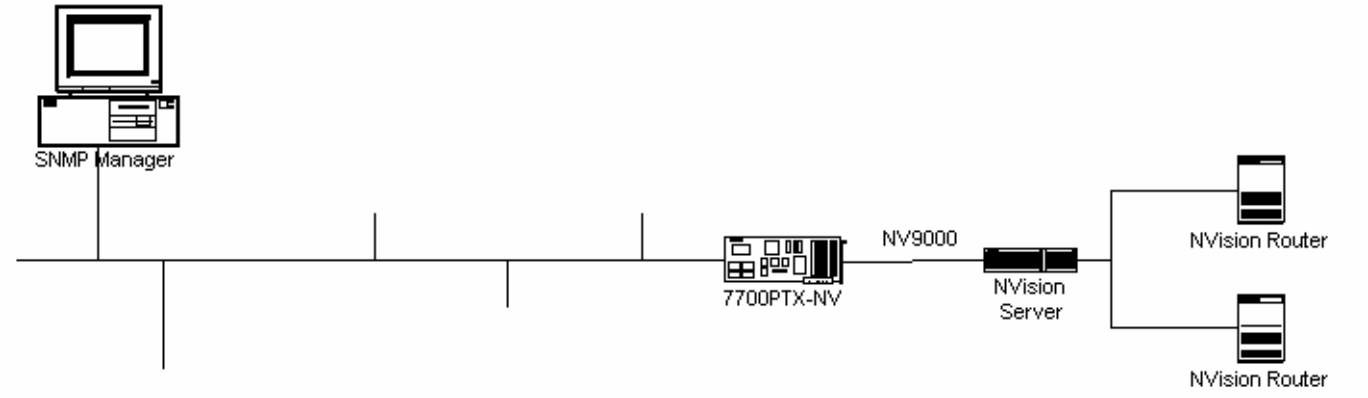

Figure 1-2: Typical 7700PTX-NV Ethernet Setup

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.

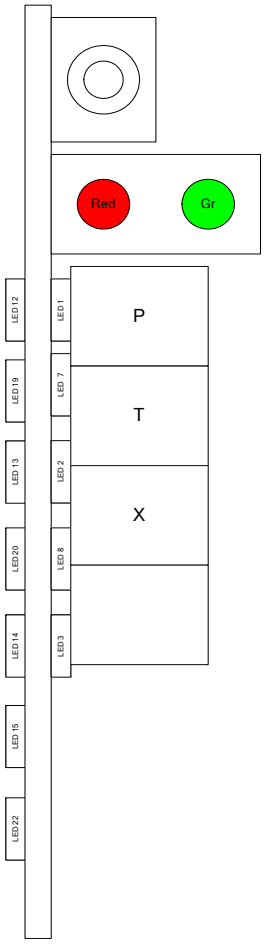

Figure 2-1: PTX Card Edge

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

Follow the steps below to configure the 7700PTX-NV:

1. Connect a PC running a console application to the PTX debug/monitor port via the adapter cable.

2. Configure the 7700PTX-NV's network parameters.

3. Decide if the 7700PTX-NV will communicate with the NVision equipment via serial or Ethernet.

4. For serial communication, configure the parameters of each 7700PTX-NV to match those of the CTRL port of the NVision router(s). Configure the 7700PTX-NV to use the NVision Serial Protocol (NVSP).

5. For Ethernet communication, configure on the 7700PTX-NV the IP address of the NVision server; configure the 7700PTX-NV to use the NV9000 protocol.

6. Configure UMD peers if required.

7. Power off the 7700PTX-NV.

8. If the 7700PTX-NV is using NVSP, physically wire the serial port(s) to the CTRL port of the NVision router(s).

9. Power on the 7700PTX-NV.

4.2. DEBUG/MONITOR PORT CONNECTION

The 7700PTX-NV 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.

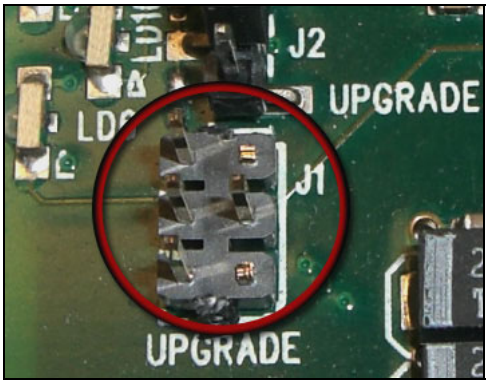

Figure 4-1: Upgrade Jumper

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 as shown in Figure 4-3.

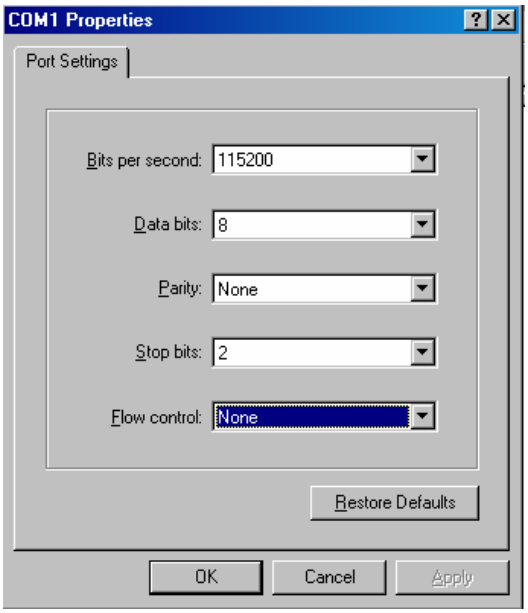

Figure 4-3: COM1 Properties

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-NV does not have power. The boot sequence and Main Menu are displayed in the HyperTerminal window.

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

13. Various 7700PTX-NV parameters are configurable via the 7700PTX-NV'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-NV'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 NVision router(s)
3	**SNMP Setup**	IP address of SNMP manager(s) to receive traps
4	**NVision Setup**	Settings specific to the NVision Serial Protocol (NVSP) or the NV9000 Ethernet 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-NV 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 set to *False*.

3. Once the network settings are configured, select *Save* and *Exit* before exiting *Network Configuration* to save the settings, otherwise select *Exit*.

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

4.5. SERIAL PORT SETUP

4.5.1. Parameters

The 7700PTX-NV has 4 serial ports. The parameters associated with each serial port are listed in Table 4-2. Typically, these connect to one of the two CTRL ports on the back of the NVision router.

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

4.5.2. Back Plate

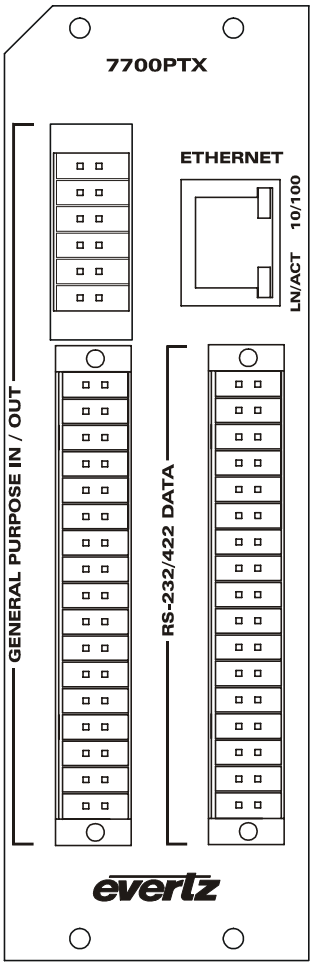

Figure 4-4: 7700PTX Back Plate

4.5.3. RS-422 Wiring

Figure 4-5 shows which pins of the back plate are used for RS-422 serial connections.

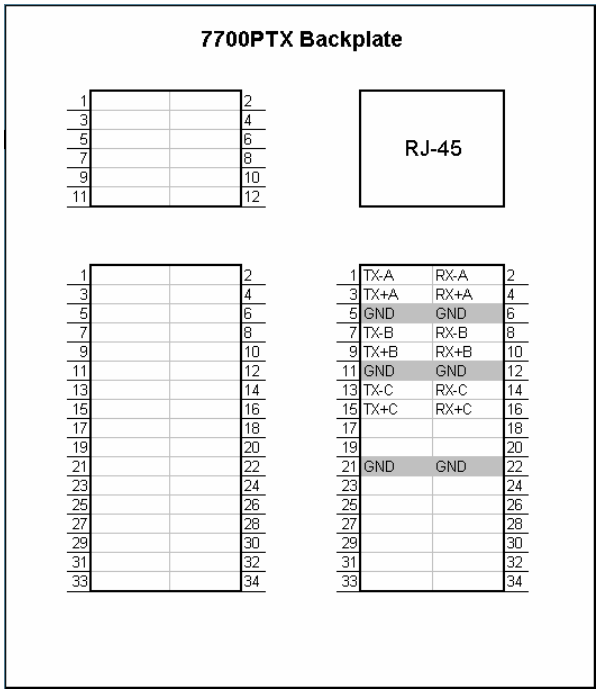

Figure 4-5: RS-422 Pins

Table 4-3 details how to connect the 7700PTX-NV to the router for RS-422 operation.

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

Table 4-3: RS-422 Wiring

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

4.6. SNMP SETUP

Table 4-4 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 4-4: SNMP Parameters

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

4.7. NVISION PROTOCOL SELECTION

The 7700PTX-NV supports two NVision protocols:

1. NVision Serial Protocol (NVSP)
2. NV9000 Protocol

By default, the 7700PTX-NV is configured to use NVSP, which provides serial control of a single NVision router.

NV9000 provides TCP/IP control of multiple NVision routers via a central communication point: *the NVision server*.

4.7.1. Enabling NV9000 Protocol Client

To enable the 7700PTX-NV to use NV9000:

1. From *Main Menu* select *NVISION Setup*
2. Select *Enable NVision 9000 Ethernet protocol*
3. Select *NVision 9000 protocol Setup*
4. Select *TCP/IP settings*
5. Select *Set NVision server IP address*
6. Enter the IP address of the NVision server
7. Select *Save and Exit*

8. The 7700PTX-NV must be rebooted for the changes to take effect

4.7.2. Enabling NVSP Client

1. From *Main Menu* select *NVISION Setup*
2. Select *Enable NVision serial protocol*
3. The 7700PTX-NV must be rebooted for the changes to take effect

4.8. NVSP SETUP

Some properties of the NVision Serial Protocol can be tailored. Sections 4.8.1 to 4.8.3 describe how to configure the Nvision Serial Protocol.

4.8.1. Router Partitions

A 7700PTX-NV using NVSP at power-up attempts to automatically discover the partition information of the router. The partition information is typically configured on the router using NVision *UniConfig*. This process can be time consuming, as the 7700PTX-NV must poll 250 partitions.

To speed up this process, configure the 7700PTX-NV with the same partition information found in the router with NVision *UniConfig*.

Perform the following steps to configure the matching partition information on the 7700PTX-NV:

1. From the *Main Menu* select *NVISION Setup*
2. Select *NVision serial protocol setup*
3. Select *NVISION Protocol Setup For Serial Port 1* (if the NVision router is connected to the 7700PTX-NV second serial port, then select *NVISION Protocol Setup For Serial Port 2*)
4. Use *Set router partition* and *Clear router partition* to configure partition information that matches that of the NVision router
5. Select *Save and Exit*
6. The 7700PTX-NV must be rebooted for the partition information to take effect

4.8.2. Power On Router Initialization

This parameter should be left as *No*.

4.8.3. Source Device ID and Address

The 7700PTX-NV uses a source device ID of 254 and a source device address of 0 when communicating to an NVision router via NVSP.

To modify the ID and source device address:

1. From *Main Menu* select *NVISION Setup*.
2. Select *NVision serial protocol setup*.
3. Select *NVISION Protocol Setup For Serial Port 1* (if the NVision router is connected to the 7700PTX-NV second serial port, then select *NVISION Protocol Setup For Serial Port 2*).
4. Select *Set source device id and address*.
5. Enter the new source device ID and source device address.
6. Select *Save and Exit*.
7. The 7700PTX-NV must be rebooted for the changes to take effect.

4.9. NV9000 SETUP

Some properties of the NV9000 protocol can be tailored. The following section describes how.

4.9.1. User ID

The requestor of a cross point switch must identify itself in the protocol by means of a 32-bit value called a user ID. By default the 7700PTX-NV uses the user ID 0x03040506 (50595078). To change this value:

1. From *Main Menu* select *NVISION Setup*.
2. Select *NVision 9000 protocol setup*.
3. Select *NV9000 protocol settings*.
4. Select *Set PTX's user ID*.
5. Enter the user ID.
6. Select *Save and Exit.*
7. The 7700PTX-NV must be rebooted for changes to take effect.

4.10. UNDER MONITOR DISPLAY SETUP

The 7700PTX-NV 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.

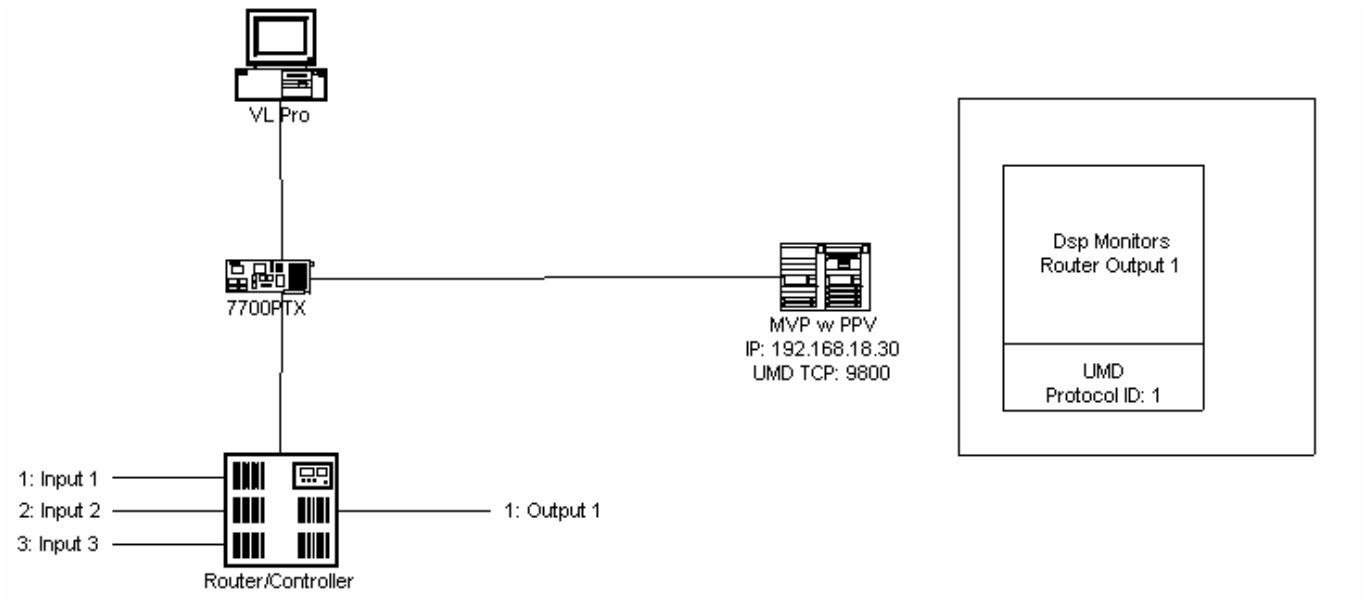

Figure 4-6: UMD Example

Where:

- A router has 3 inputs connected (labeled Input 1, Input 2, and Input 3) and 1 output (labeled Output 1)
- A 7700PTX-NV 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 *Vista*LINK® Pro configures the 7700PTX-NV 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-NV 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-NV must be rebooted for any UMD peer changes to take effect.

5. TROUBLESHOOTING TIPS

5.1. VLPRO NOTES

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

2. The 7700PTX-NV 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 NVSP 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-NV is actively communicating with the router on that port. If the state is consistently reported as *down* then the 7700PTX-NV 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-NV is able to communicate with a router connected to port 2.

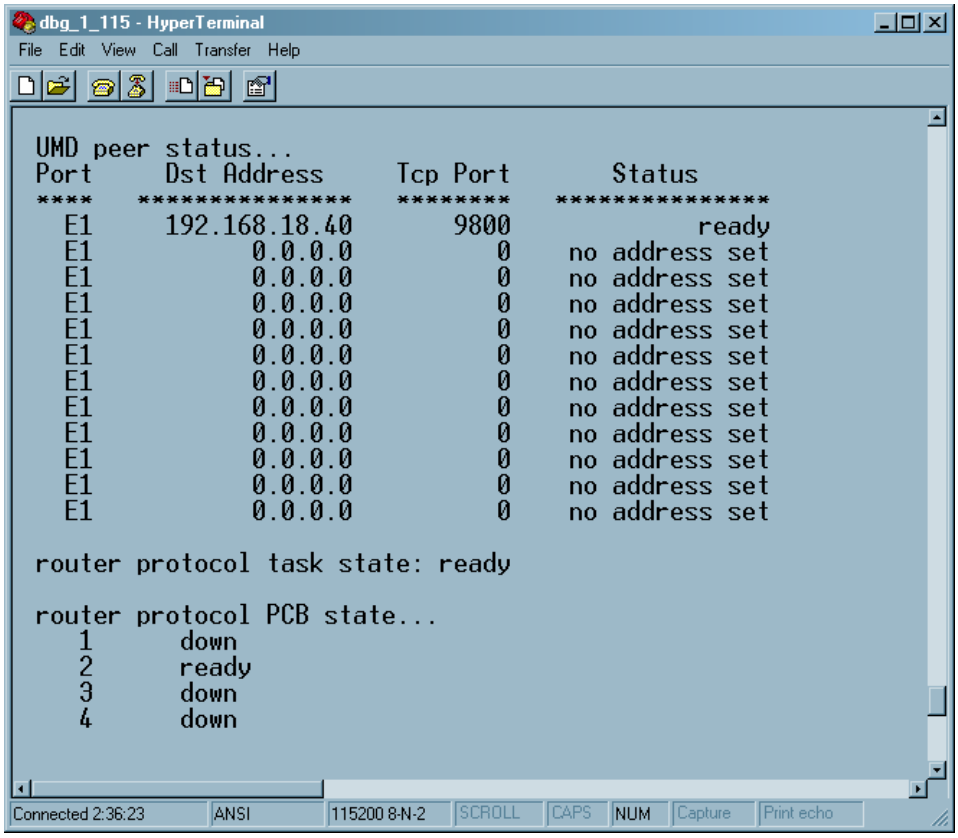

Figure 5-1: Communication States

5.3. CHECKING UMD PEER COMMUNICATION

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

2. Select *Show task state*.

3. There are 12 UMD peer entries listed under the heading *UMD peer status…* A status reported as *ready* indicates the 7700PTX-NV is able to communicate with that UMD peer. A status consistently reported as something other than ready indicates the inability of the 7700PTX-NV 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-NV 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. CHECKING NV9000 COMMUNICATION

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

2. Select *Show task state*.

3. As per Figure 5-2, *router protocol PCB* state 1 should appear as ready. This reports the 7700PTX-NV's ability to exchange NV9000 protocol data with the server. The *Router ethernet state* should appear as *ready*. This reports the 7700PTX-NV's ability to exchange TCP data with the server. If this state is consistently reported as *down* then you should check the IP address of the server, the server's ability to receive TCP traffic over TCP port 9193, use a computer to ping both the 7700PTX-NV and the server.

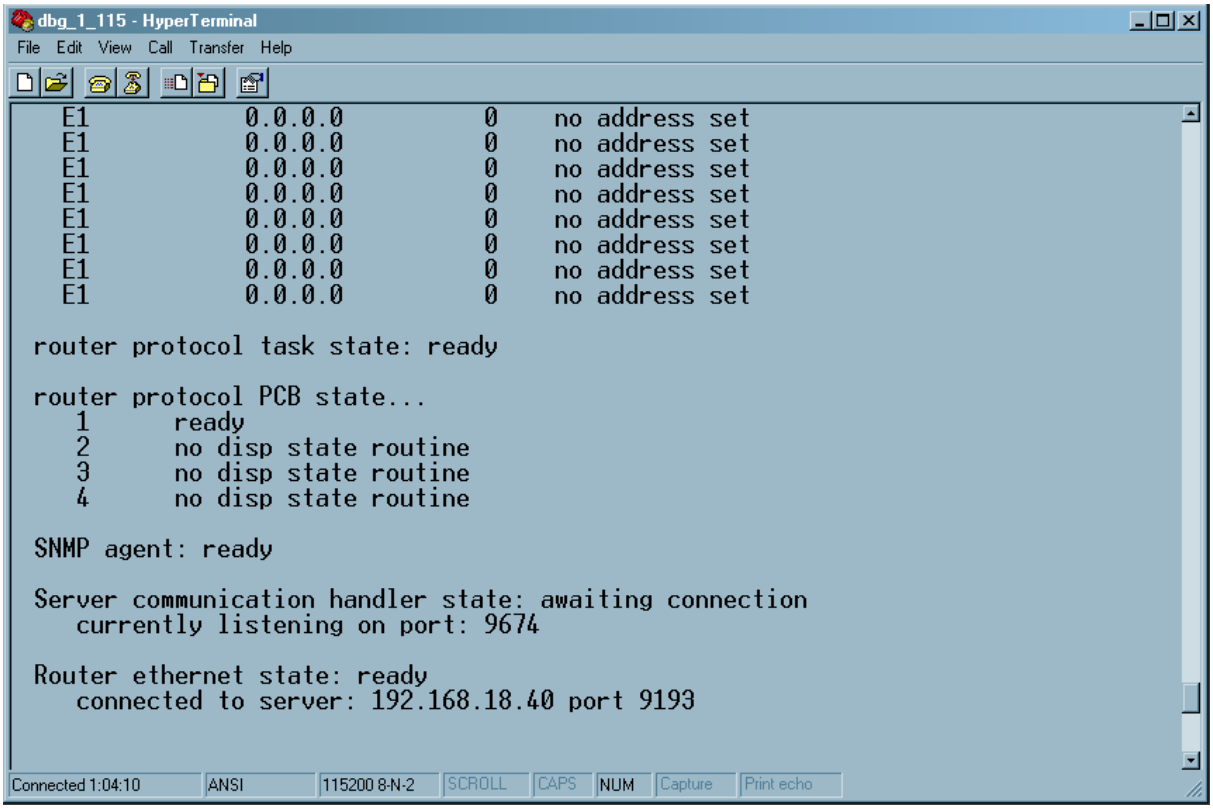

Figure 5-2: NV9000 Communication State

5.5. NVSP ROUTER POLLING

By default, the 7700PTX-NV polls each router at twenty-second intervals. A poll cycle consists of fetching all cross points. It is also used to determine the 7700PTX-NV-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-NV 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. *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-NV 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.