TABLE OF CONTENTS

Figures

Tables

REVISION HISTORY

REVISION	DESCRIPTION	DATE
0.1	Preliminary Version	Oct 04

1. OVERVIEW

1.1. PORTS

The 7700PTX-NV is a network-controlled protocol translator that translates SNMP or TCP application 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 shows how the 7700PTX-NV is typically set up for serial communication.

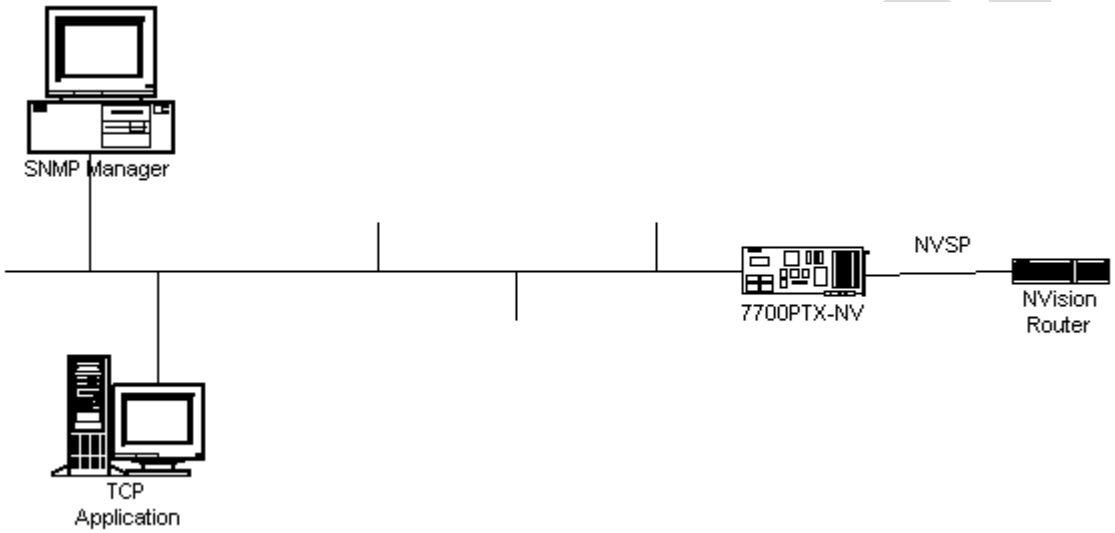


Figure 1: Typical 7700PTX-NV Serial Setup

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

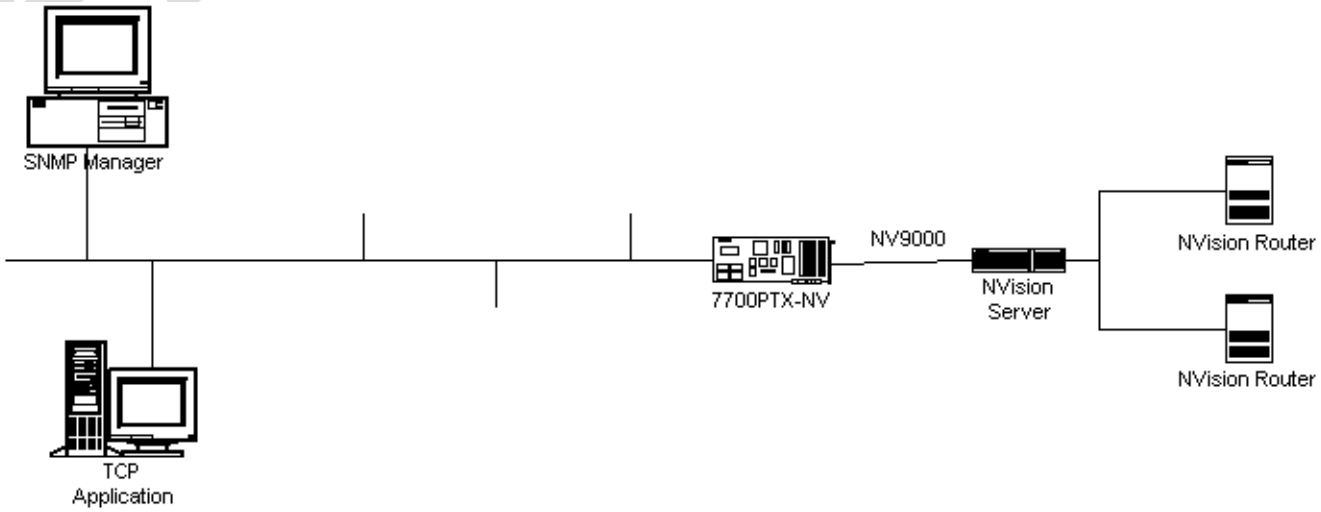


Figure 2: Typical 7700PTX-NV Ethernet Setup

2. BASIC CONFIGURATION

2.1. CONFIGURATION STEPS

To configure the 7700PTX-NV:

1) Connect a PC running a console application (Windows HyperTerminal) to the 7700PTX-NV debug/monitor port via the adapter cable
2) Power on the 7700PTX-NV
3) Configure the 7700PTX-NV network parameters
4) Decide if the 7700PTX-NV will communicate with the NVision equipment via a serial or Ethernet link
5) For serial communication, configure the parameters of each 7700PTX-NV serial port to match those of the CTRL port of the NVision router(s). Configure the 7700PTX-NV to use the NVision Serial Protocol (NVSP)
6) For Ethernet communication, configure on the 7700PTX-NV the IP address of the NVision server, configure the 7700PTX-NV to use the NV9000 protocol
7) Power off the 7700PTX-NV
8) If the 7700PTX-NV is using NVSP, physically wire its serial port(s) to the CTRL port of the NVision router(s)
9) Power on the 7700PTX-NV

For detailed instructions on configuring serial and network connections please see Chapter 5

2.2. CARD EDGE CONTROLS

2.2.1. Determining Current Settings

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

2.2.2. Clearing Previous Settings

To clear ALL current settings, apply power to the card while holding the toggle switch UP. The Red LED (the left of the two LEDs) will light. When the Red LED is off and the Green LED (the right of the two LEDs) lights, the settings have been cleared, and you can enter your new settings.

2.2.3. Card Edge LEDs

LED 15 (when facing the card edge, on the left side; sixth from the top) is lit when Ethernet activity is detected.

All other card edge LEDs are for factory use only.

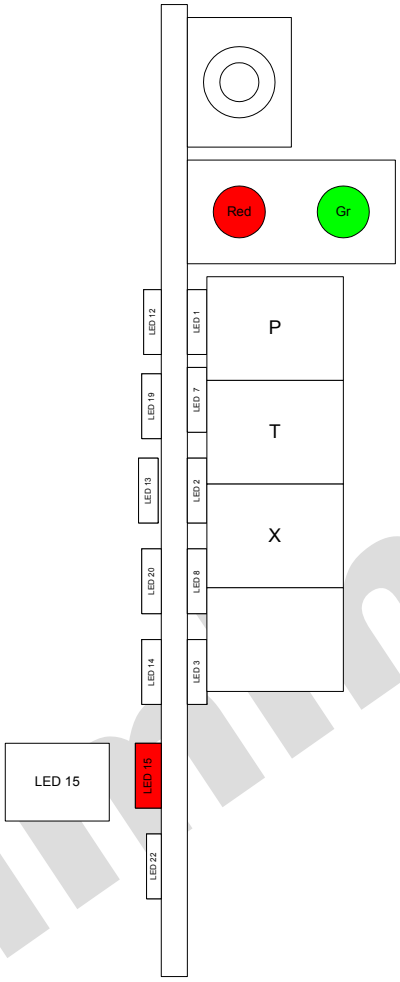


Figure 3: PTX Upper Card Edge

2.3. DEBUG/MONITOR SERIAL PORT SETTINGS

The 7700PTX-NV is configured via the debug/monitor serial port, the header of which is labeled *J1*. A special adapter cable allows the 7700PTX-NV to connect to a PC. A terminal application (such as *HyperTerminal* in ANSIW emulation mode) uses the serial port settings given in Table 1.

Setting	Value
Baud rate	115,200
Number of data bits	8
Parity	None
Number of stop bits	2

Table 1: Debug/Monitor Serial Port Settings

2.4. MAIN MENU

Table 2 lists the entries available in the 7700PTX-NV 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 the SIO ports of the Encore controller
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 label of the source associated with a particular output
6	Engineering/Debug	Used for troubleshooting

Table 2: 7700PTX-NV Main Menu

2.5. NETWORK CONFIGURATION

To configure the network settings of the 7700PTX-NV, select *Network Configuration* from the *Main Menu*.

If DHCP is desired, the *Use DHCP* field should be set to *true*. Otherwise, input the IP address, subnet mask, and gateway (if any) and set the *Use DHCP* field *false*.

Once the network settings are configured, select *Save* and *Exit* before exiting *Network Configuration*, otherwise select *Exit*. The 7700PTX-NV must be rebooted for any network changes to take effect.

2.6. SERIAL PORT SETUP

Table 3 lists the parameters of the 7700PTX-NV serial ports when connecting to one of the two CTRL ports of an NVision router. The serial port settings must match those of the connected NVision CTRL port.

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

Table 3: Serial Port Parameters

2.7. SERIAL PORT WIRING

The back plate connections of the 7700PTX-NV are shown in Figure 4.

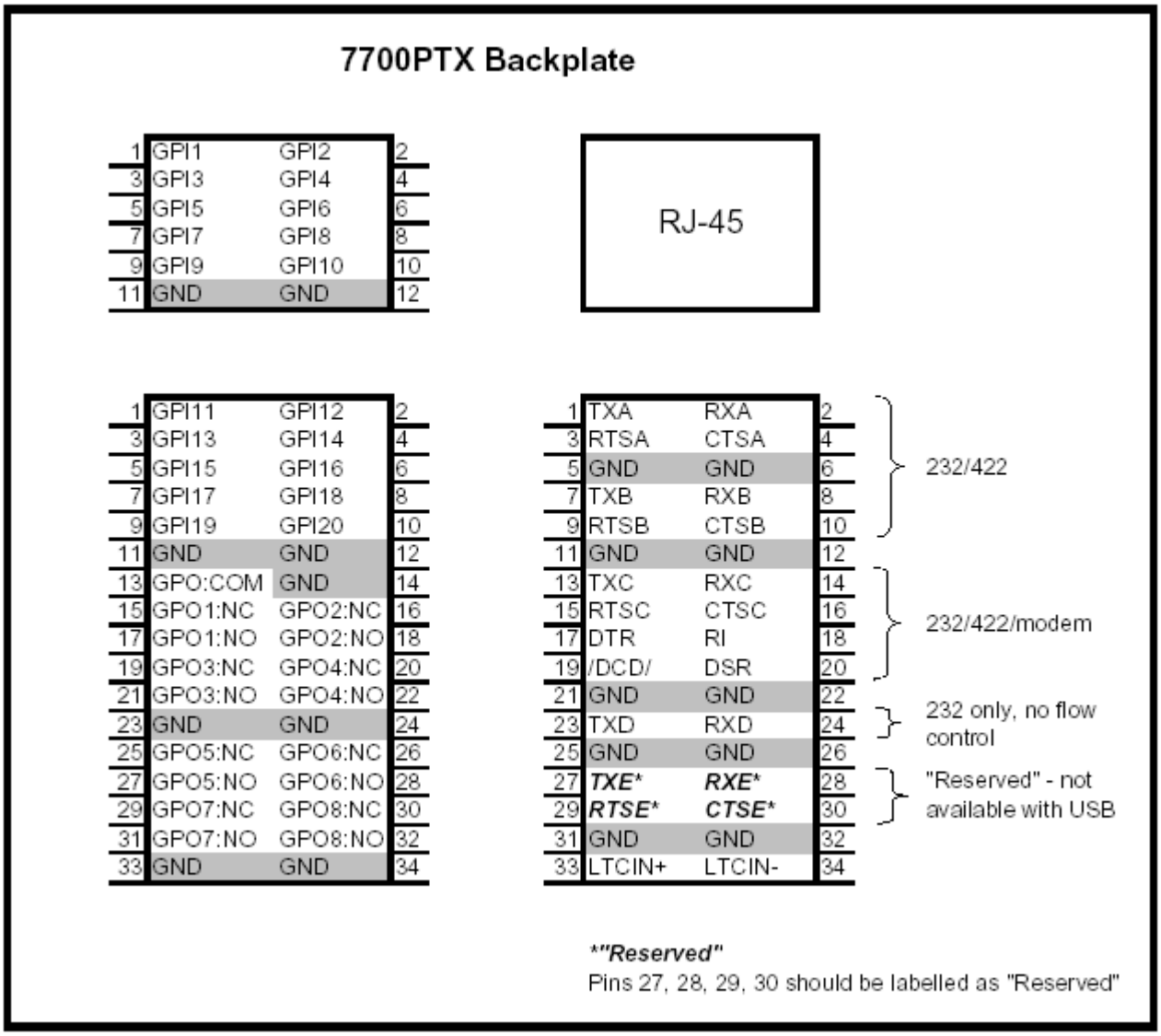


Figure 4: Back Plate Connections

The serial ports located under the RJ-45 block are labeled A – D. These correspond to serial ports 1 – 4. Serial port E is currently not in use.

2.7.1. RS-422 Wiring

7700PTX-NV Pin	NVision CTRL Pin
Tx (tx-)	Receive A- (8)
Rts (tx+)	Receive B+ (3)
Gnd	Receive Common (4)
Rx (rx-)	Transmit A- (2)
Cts (rx+)	Transmit B+ (7)
Gnd	Transmit Common (6)

Table 4: RS422 Wiring

2.8. NVISION PROTOCOL SETUP

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.

2.8.1. 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

2.8.2. 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

3. EXTENDED CONFIGURATION

Section 2 covers the steps required to configure the 7700PTX-NV for most installations. However, further configuration is available for extended features.

3.1. SNMP SETUP

The 7700PTX-NV monitors its ability to communicate with an NVision router or NVision server. It can communicate its status with an SNMP manager via traps. If this is desired, then the IP addresses of any SNMP managers can be added or removed via the *SNMP Setup* entry of the *Main Menu*. Once an SNMP manager is added or removed, the setting takes effect immediately – no reboot is required. By default, no SNMP manager IP addresses are configured.

3.2. NVSP SETUP

Some properties of the NVision Serial Protocol can be tailored. This section describes how.

3.2.1. 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*.

To configure matching partition information on the 7700PTX-NV:

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) 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

3.2.2. Power On Router Initialization

Typically, an NVision router restores its previous cross point settings when powered on. Routers that restore croos point settings should not have Reset Route Initialization enabled.

Routers that lose the cross point settings when powered off can be restored by the 7700PTX-NV when the router is powered on. To enable this feature:

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 power on reset router initialization
5) When prompted select y to enable or n to disable the feature
6) Select Save and Exit
7) The 7700PTX-NV must be rebooted for the feature to take effect

3.2.3. 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

3.3. NV9000 SETUP

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

3.3.1. 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. DEBUG TIPS

4.1. STATISTICS

The 7700PTX-NV tracks a wide variety of statistical information. These statistics are viewed via the *Show task statistics* entry of the *Engineering/Debug* menu. Some of these statistics are discussed briefly below.

4.1.1. Serial Port Activity

4.1.1.1. Incoming

An example of incoming serial port activity is represented by the following:

```
framer statistics...
  in     in    in
prot   port   subp                    valid      cmds      cmds     timeout              no
  id     id     id      in chars    cmds out   too lng  malfrmd  discrds   no outQ  mbufs
**** **** ***** ********** ********** ******* ******* ******* ******* *******
```

```
10NV 1S1        0  0x00000003 0x00000001 0x00000 0x00000 0x00000 0x00000 0x00000
10NV 2S2        0  0x00000003 0x00000001 0x00000 0x00000 0x00000 0x00000 0x00000
10NV 3S3        0  0x00000003 0x00000001 0x00000 0x00000 0x00000 0x00000 0x00000
10NV 4S4        0  0x00000003 0x00000001 0x00000 0x00000 0x00000 0x00000 0x00000
```

An example of incoming Ethernet activity is represented by the following:

```
framer statistics...
  in       in     in
prot   port   subp                          valid       cmds      cmds     timeout                 no
  id       id     id        in chars       cmds out    too lng  malfrmd  discrds    no outQ  mbufs
**** **** ***** ********** ********** ******* ******* ******* ******* *******
14ND  6E1       1  0x00000003 0x00000001 0x00000 0x00000 0x00000 0x00000 0x00000
```

These statistics are described in Table 5

Parameter	Notes
In prot id	The router protocol expected on this serial port displayed in both a numeric (10 for NVSP, 14 for NV9000) and textual (NV for NVSP, ND for NV9000) format.
In port id	The port identifier in both numeric (1 – 4 for serial, 6 for Ethernet) and textual (S1 – S4 for serial, E1 for Ethernet) format.
In subp id	The sub-port identifier. Serial ports do not require a sub-port ID so this value should be 0.
In chars	The number of alpha-numeric characters received from the NVision router or NVision server. If a router is connected and this value is 0 it may mean: • The serial port configuration is incorrect • The serial port wiring is incorrect
Valid cmds out	The number of full packets received by the 7700PTX-NV.
Cmds too long	The number of packets received that were too long. Typically, this field should be 0. If not, it may point to bad wiring or incorrect serial port settings.
Cmds malfmd	The number of bad packets received by the 7700PTX-NV. Typically, this field should be 0 during normal router operation. If not, it may point to bad wiring or incorrect serial port settings.
Timeout discards	The number of packets discarded due to inactivity. This value gets incremented if part of a packet is received. This value should normally be 0.
No outQ	This value should be 0.
No mbufs	The number of packets discarded due to lack of internal storage on the 7700PTX-NV. The value should normally be 0.

Table 5: Incoming Statistics

4.1.1.2.Outgoing

The following represents an example of outgoing serial port activity:

```
outgoing serial port statistics...
Port    Out Cmds
****   **********
 S1    0x00000001
 S2    0x00000001
 S3    0x00000001
 S4    0x00000001
```

These statistics are described in Table 6.

Parameter	Notes
Port	The port identifier in textual (S1 – S4) format.
Out Cmds	The number of packets sent by the 7700PTX-NV to the NVision router.

Table 6: Outgoing Serial Port Statistics

The following represents an example of outgoing Ethernet activity:

Router ethernet statistics...
data pkts tx (pass): 0x0000000e
data pkts tx (fail): 0x00000000

These statistics are described in Table 7.

Parameter	Notes
data pkts tx (pass)	The number of packets successfully sent over TCP/IP by the 7700PTX-NV to the NVision server.
data pkts tx (fail)	The number of packets which failed to be sent over TCP/IP by the 7700PTX-NV to the NVision server.

Table 7: Outgoing Ethernet Port Statistics

4.2. OPERATIONAL STATE

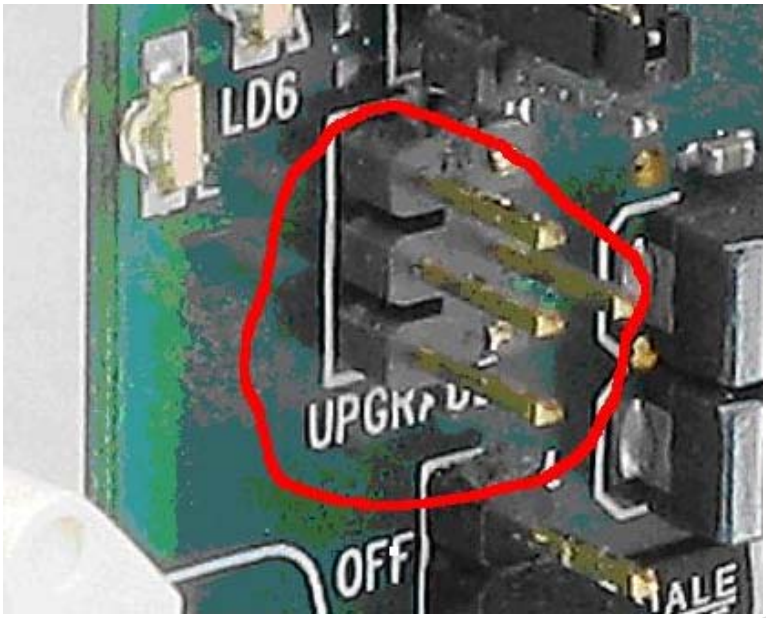
The state of the various 7700PTX-NV tasks is accessed via the *Show task state entry* of the *Engineering/Debug* menu. Generally speaking, all tasks/statuses should report their status ready.

5. CONFIGURING NETWORK AND SERIAL CONNECTIONS

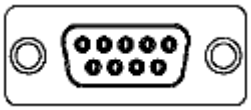
5.1. MAKING THE SERIAL CONNECTION

1) Take 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.



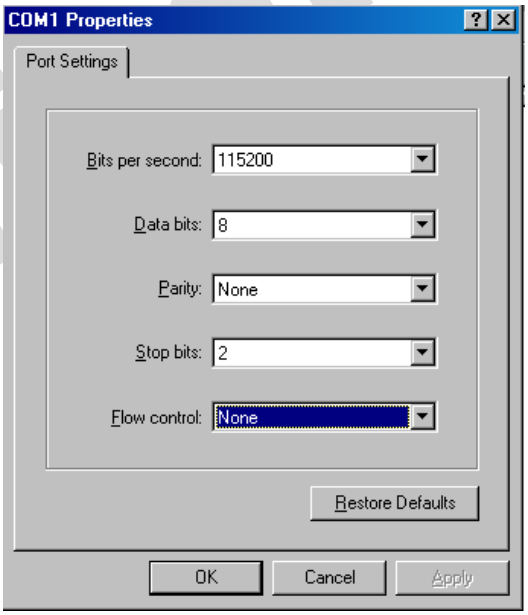
3) Connect the other end of the upgrade cable to the serial or COM port of the computer. This is commonly called a DB-9 connector.



5.2. CONFIGURING THE SERIAL CONNECTION

1) On the Windows computer, click “Start”. A menu opens.
2) Click “Programs”. A menu opens.
3) Click “Accessories” A menu opens.
4) Click “Communications”. A menu opens.
5) Click “HyperTerminal”. A window opens.
6) Enter a name for your connection. Example: “PTX”.
7) Press the <Enter> key. A new “Connect To” window opens.

8) Enter country and area code details in the appropriate spaces. If COM1 is already taken for another device, choose COM2.
9) Press the <Enter> key or click OK. “HyperTerminal” and “Properties ”windows open.

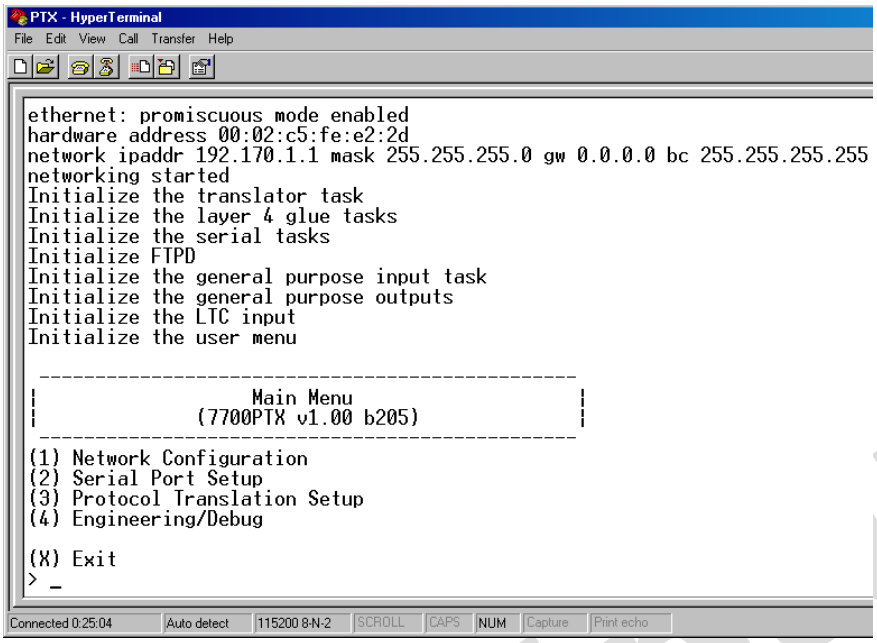


10) Enter the information as listed in the illustration above, the same as in the table below.

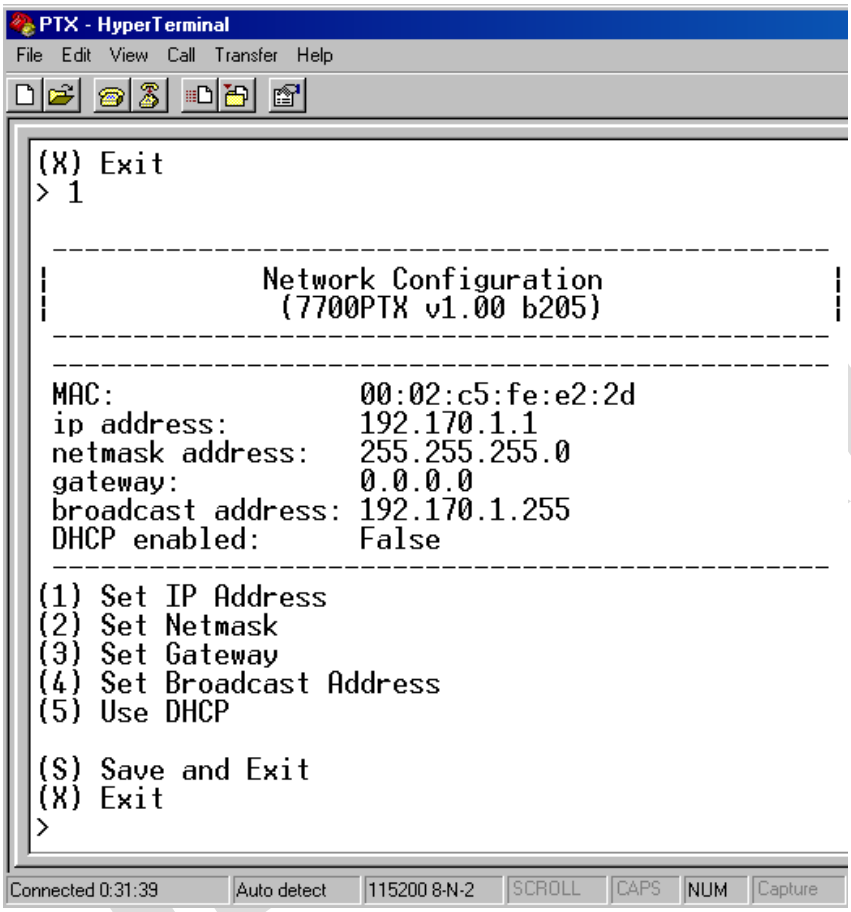
Baud	115200
Data bits	8
Parity	None
Stop bits	2
Flow Control	None

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

12) Apply power to the card. The boot sequence is displayed in the HyperTerminal window.



13) Use the numbered menu on the HyperTerminal window to change settings. For example, press 1 and <Enter> to change the Network Configuration, including IP address, Net Mask, Gateway, and Broadcast Address, or to use DHCP.



5.3. FINDING THE COMPUTER IP ADDRESS

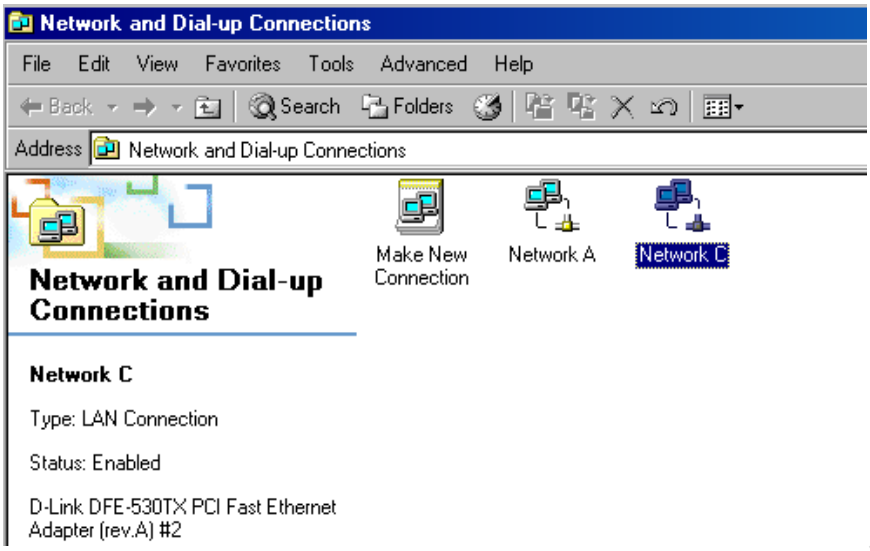
On a network, you might not have any control over what the IP address of your computer is. The following example is for Windows 2000, which may differ from other operating systems.

To learn the IP address of your computer in MSFT Windows 2000:

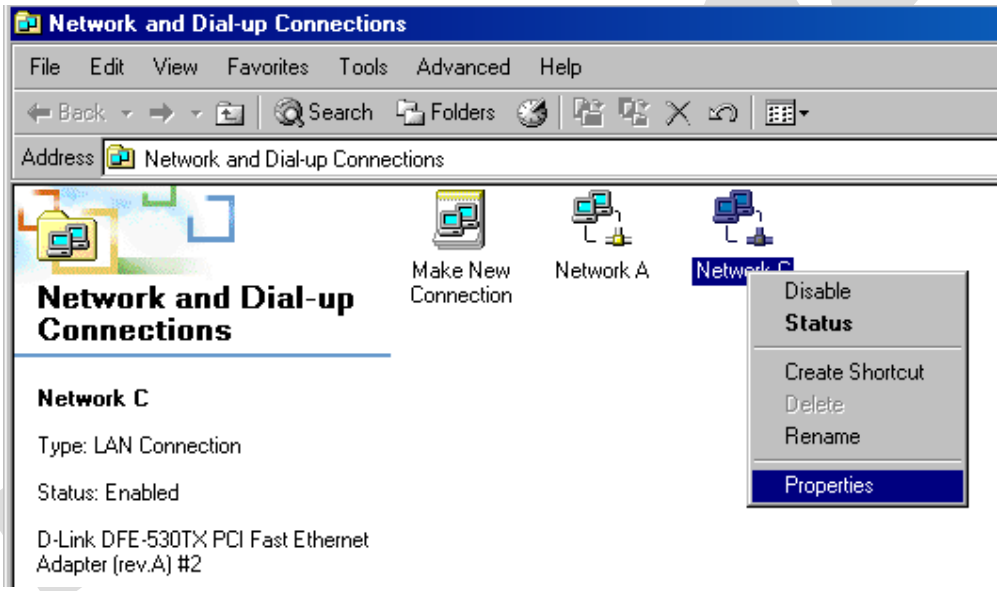
1) Click “Start”. A menu opens.
2) Click “Programs”. A menu opens.
3) Click “Accessories” A menu opens.
4) Click “Communications”. A menu opens.
5) Click “Network and Dial-up Connections”. A new pane opens. In the new pane will be icons, including one titled “Make a New Connection”. Your network card icon(s) should also be visible there.

If there is no network card icon in the computer, please see your IT staff

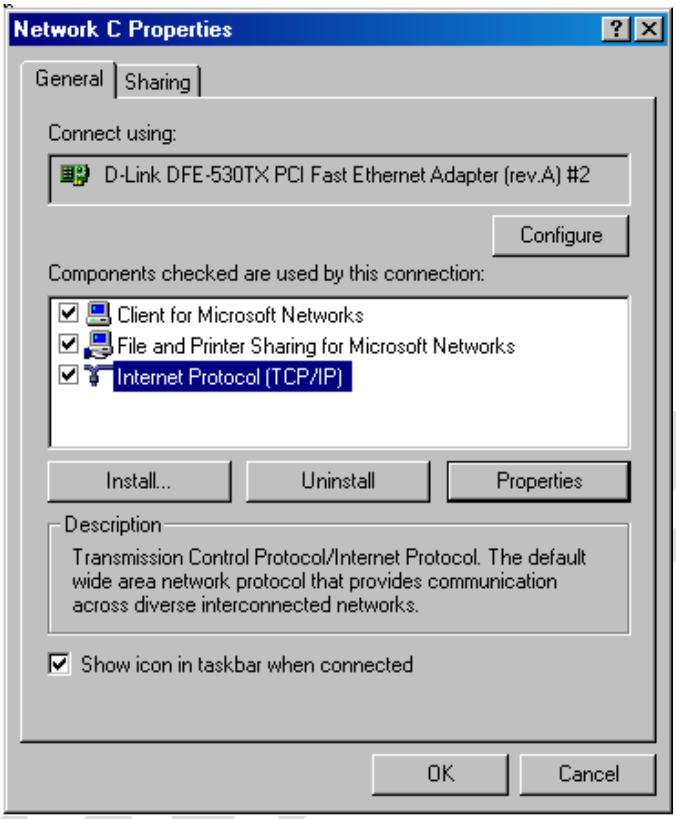
In the example below there are two Network Interface Cards. Network A is the corporate network, which we won’t change. Network C is what we’ll use to connect to the PTX.



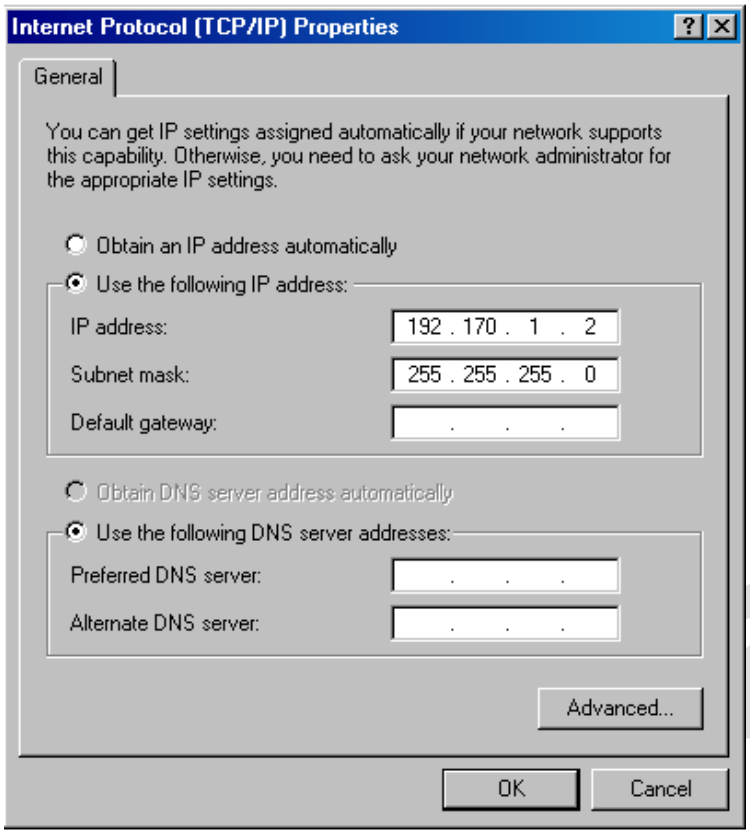
1) Highlight the icon of the NIC you wish to use to connect with the PTX.
2) Right click the icon. A menu opens.



3) Click “Properties”. A Network Properties window opens.



4) Ensure a box next to “Internet Protocol (TCP/IP)” is checked, meaning it is installed. If TCP/IP is not installed in the computer, please see your IT staff.
5) Highlight “Internet Protocol (TCP/IP)”
6) Click on the PROPERTIES button. A TCP/IP Properties window opens.



7) View the IP Address provided. If no IP address is present, you must enter one, as you cannot obtain one automatically from the PTX.

5.4. SETTING THE COMPUTER IP ADDRESS

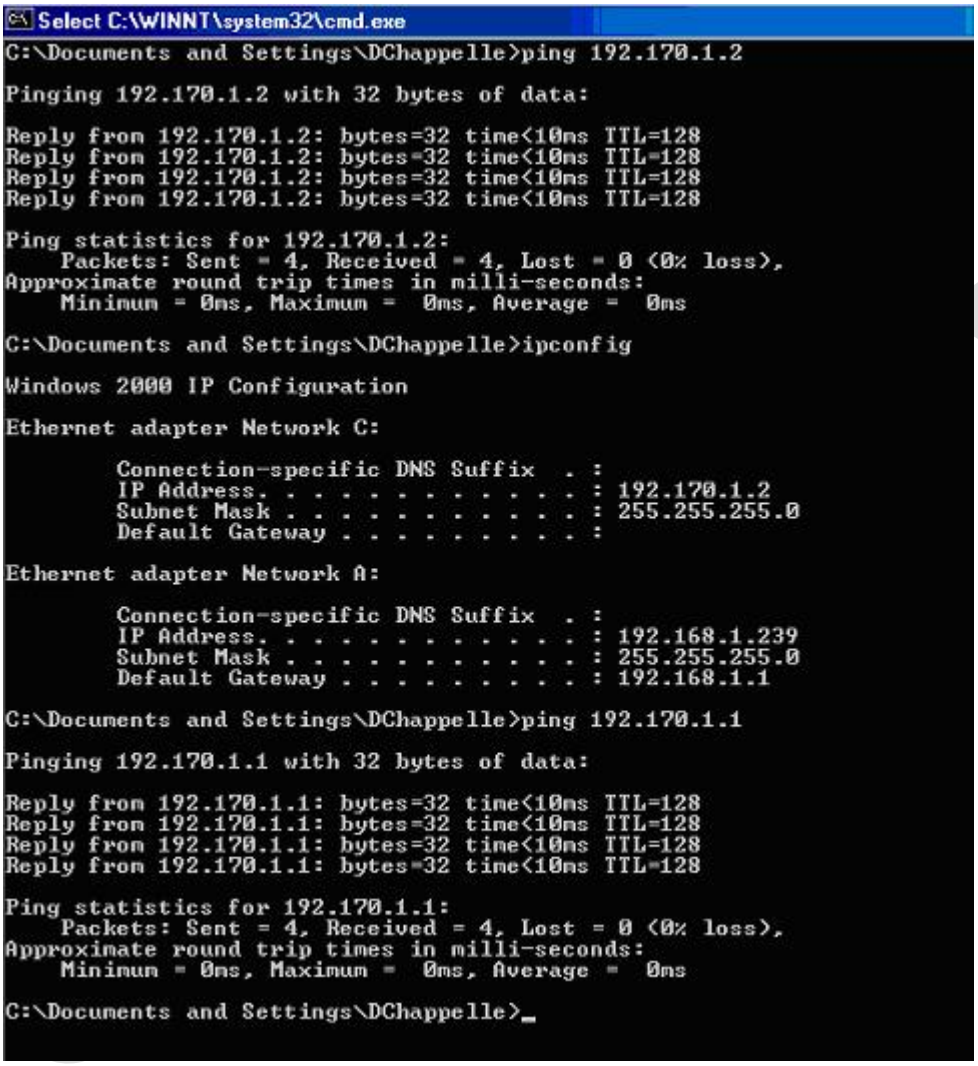
1) In the "Properties" window, click the round box next to "Use the following IP address".
2) Enter the IP address desired. Example: 192.170.1.2
3) Your PTX and NIC must be on the same subnet. If no number is already specified, enter 255.255.255.0 as the Subnet Mask.
4) Click OK. The TCP/IP Properties window closes.
5) Click OK. The Network Properties window closes.

During normal operation, press down the card edge toggle switch to view the IP address on the card edge LCD.

5.5. TESTING AN ETHERNET CONNECTION

Ping is a method of determining if a device is connected to a network. You can ping the addresses of your PTX and computer network interface cards.

1) Click Start. A menu opens
2) Click Run. A windowpane opens
3) Type "Cmd" and press enter. The Command Prompt windowpane opens.
4) At the Command Prompt, type *ping*, space, and the IP address of the device you are pinging. Press Enter. You should see the results of your ping in the command prompt window.



Once your computer NIC IP Address is correctly configured you can communicate with other devices on the network.

6. PERFORMING A FIRMWARE UPGRADE

There are two ways to upgrade PTX firmware:

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

FTP is recommended, as it is much quicker.

6.1. FTP

Suppose the PTX IP address is 192.168.18.22, its firmware file is called ptx.bin, and the firmware file is located in c:\temp.

1) Open a command prompt window (in Windows: Start/Programs/Accessories/Command Prompt)
2) Enter the command: *cd c:\temp*.

3) Enter the command: *ftp –A 192.168.18.22*.
4) Enter the FTP command: *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

Suppose the firmware file is called ptx.bin:

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) Set the terminal application serial port settings to 115200 8 N 2.
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 firmware file 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.