

TABLE OF CONTENTS

1. OVERVIEW	1
2. INSTALLATION	2
2.1. CONNECTING GPI/GPO, RS-232/422 INTERFACES	3
2.2. GENERAL PURPOSE INPUTS & OUTPUTS	6
2.3. CONFIGURING THE MODULE OVER AN RS-232 SERIAL CONNECTION	7
2.3.1. Network Configuration Menu	9
2.3.2. SNMP Configuration Menu	10
2.3.3. Auxiliary Serial Port Configuration Menu	11
3. SPECIFICATIONS	12
3.1. GENERAL PURPOSE INTERFACE INPUTS	12
3.2. GENERAL PURPOSE INTERFACE OUTPUTS	12
3.3. DATA INPUT SERIAL PORT	12
3.4. ELECTRICAL	12
3.5. PHYSICAL	12
4. STATUS INDICATORS	13
5. CARD EDGE CONTROLS	14
6. LOCATION OF LEDS AND JUMPERS	15
6.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS	15
6.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES	15
6.2.1. Upgrading the Firmware Using FTP	16
6.2.1.1. Determine the IP Address of the Module.....	16
6.2.1.2. Establishing a Valid Network Connection.....	16
6.2.1.3. FTP Upgrade	17
6.2.1.4. Completing the FTP Upgrade.....	19
6.2.2. Upgrading the Firmware Over an RS-232 Serial Connection.....	19
6.3. CONTROLLING GPI PULLUP VOLTAGE	19
7. VISTALINK® REMOTE MONITORING/CONTROL	20
7.1. WHAT IS VISTALINK®?	20
7.2. VISTALINK® MONITORED PARAMETERS	20
7.3. VISTALINK® CONTROLLED PARAMETERS	20
7.4. VISTALINK® TRAPS	21

Figures

Figure 1-1: 7700TPI Block Diagram	2
Figure 2-1: 7700TPI Rear I/O Module and Pinout Assignments	3
Figure 2-2: Typical GPI Circuitry	7
Figure 2-3: Typical GPO Circuitry	7
Figure 2-4: 7700TPI Main Menu.....	8
Figure 2-5: 7700TPI Network Configuration Menu.....	9
Figure 2-6: 7700TPI SNMP Configuration Menu	10
Figure 2-7: 7700TPI Auxiliary Serial Port Configuration Menu	11
Figure 4-1: LED Status Indicators and Card Edge Controls	13
Figure 5-1: Card Edge Controls	14
Figure 6-1: LED and Jumper Locations.....	15
Figure 6-2: Opening a DOS Command Window	16
Figure 6-3: Pinging a 7700TPI Module.....	17
Figure 6-4: FTP Upgrading a 7700TPI Module	18

Tables

Table 2-1: Upper Left 2x6 Terminal Block Connector Pin Assignments	4
Table 2-2: Lower Left 2x17 Terminal Block Connector Pin Assignments	5
Table 2-3: Lower Right 2x17 Terminal Block Connector Pin Assignments	6
Table 2-4: 7700TPI Configuration COM Settings.....	8
Table 7-1: <i>VistaLINK</i> ® <i>Monitored</i> Parameters	20
Table 7-2: <i>VistaLINK</i> ® <i>Controlled</i> Parameters	20
Table 7-3: <i>VistaLINK</i> ® Traps	21

Preliminary

REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
0.1	Preliminary version	Aug 06
0.2	Updated <i>VistaLINK</i> [®] section. General cleanup.	Dec 08

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Preliminary

1. OVERVIEW

The 7700TPI *VistaLINK*[®] module links third-party equipment and Evertz *VistaLINK*[®] Network Management System (NMS). Third-party equipment with fault alarming capabilities via General Purpose Interface outputs (GPO), serial RS-232/422/485 connection, or Ethernet can communicate fault alarm conditions to the *VistaLINK*[®] application software through the 7700TPI to SNMP translator thereby extending fault monitoring capabilities across the broadcast network.

The 7700TPI comes equipped with 4 RS-232/422/485 serial ports and 1 10/100 Mb Ethernet port. These ports can also be utilized to communicate and provide remote control to third-party equipment.

The 7700TPI module is also equipped with 8 General Purpose Interface outputs (GPO) and can be utilized to relay a state level from the *VistaLINK*[®] system to connected gear. Configuration changes or additional fault alarming are also possible through this interface.

The 7700TPI module fits conveniently into Evertz's universally installed 7700FR-C frame and provides a cost-effective and space-efficient third-party interface (TPI) solution.

VistaLINK[®] offers remote monitoring, control and configuration capabilities via Simple Network Management Protocol (SNMP) giving the flexibility to manage operations, including signal monitoring and module configuration from SNMP capable control systems (Manager or NMS).

Features:

- 20 opto-isolated General Purpose Interface inputs (GPI)
- Enabled GPI alerts translated and reported to Network Management System (NMS) user interface via SNMP
- Selectable +5V or +12V supply for driving GPI over longer cable runs
- 8 relay closure General Purpose Interface outputs (GPO)
- 4 serial ports RS-232/422 selectable
- GPI/GPO/Serial connections easily accessed through pin-headers (Phoenix Terminal Blocks) on rear plate
- Modular, conveniently fits into 7700FR-C 3RU frame
- Module status LED and simple GPI input diagnostics
- Frame status trigger
- *VistaLINK*[®] enabled for remote monitoring and control via SNMP

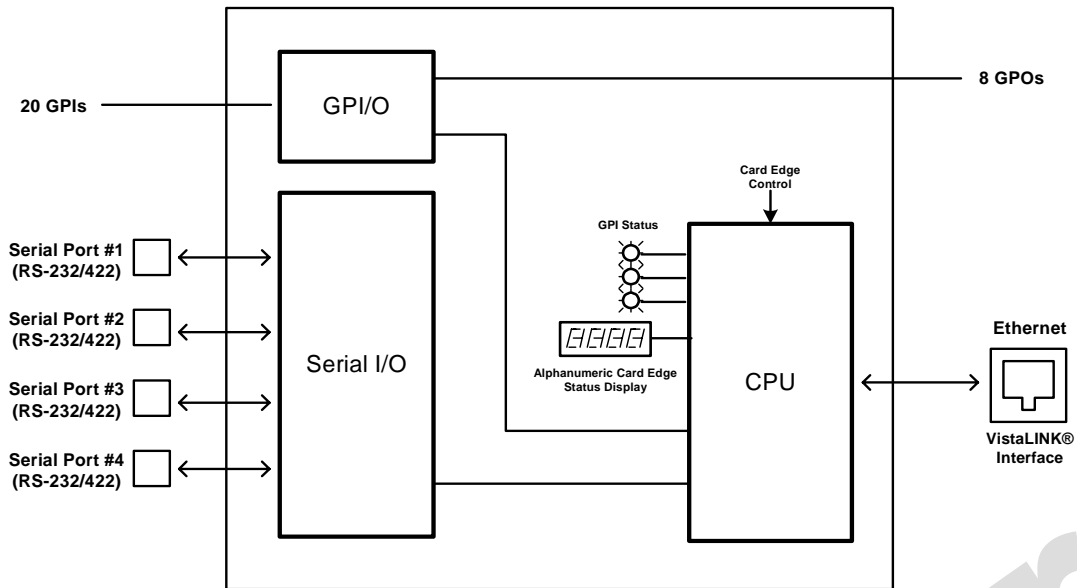


Figure 1-1: 7700TPI Block Diagram

2. INSTALLATION

The 7700TPI comes with a companion rear plate that occupies 2 slots in the frame. For information on inserting the module into the frame see the 7700FR chapter section 3.

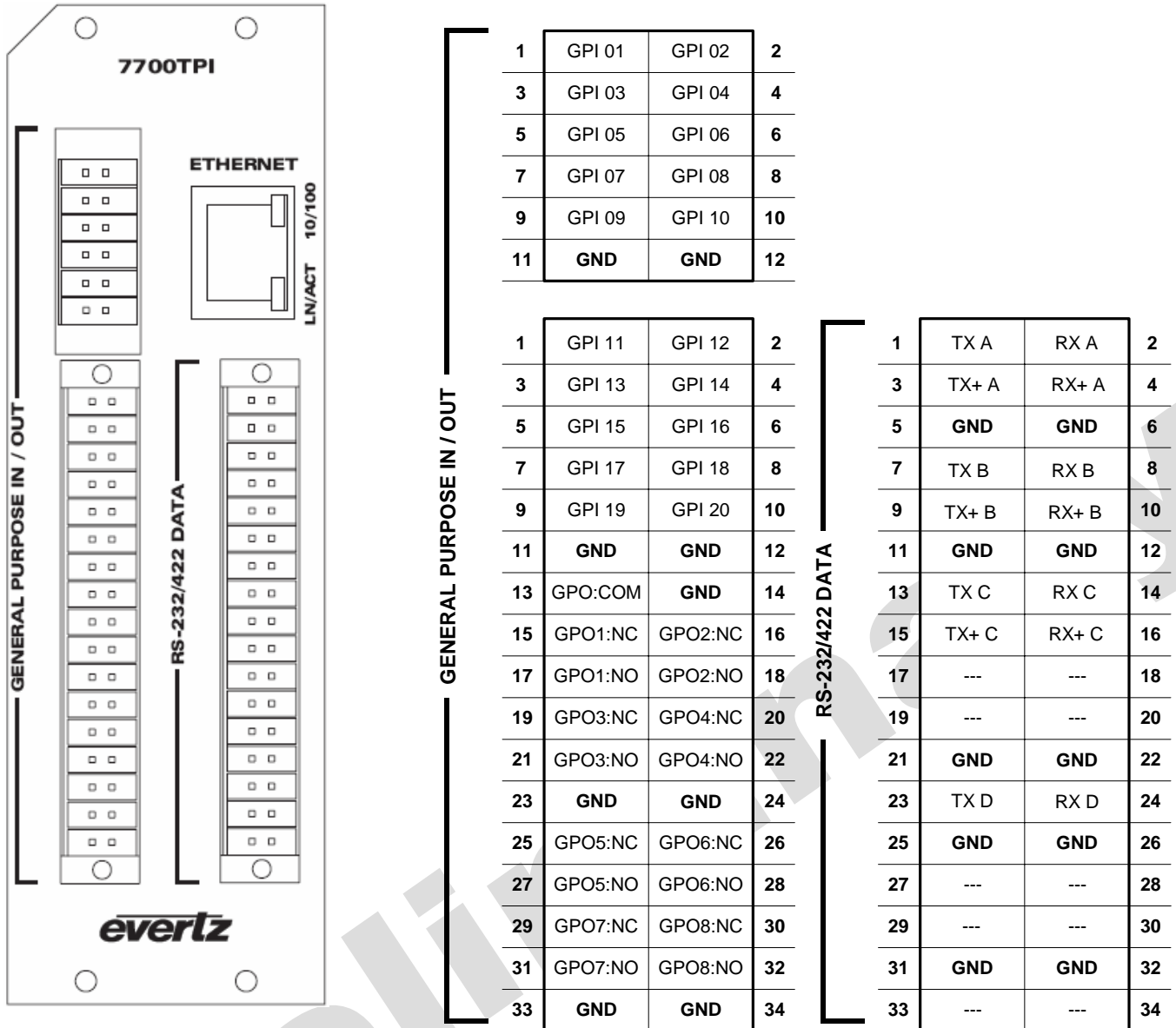


Figure 2-1: 7700TPI Rear I/O Module and Pinout Assignments

2.1. CONNECTING GPI/GPO, RS-232/422 INTERFACES

Three Terminal Block connectors are used to interconnect GPI, GPO, and serial communication lines to the 7700TPI module. The pins are identified in Figure 2-1 and defined in Table 2-1, Table 2-2 and Table 2-3. The input cables can be secured into the removable portion of the terminal strips using a small screwdriver. The removable part of the terminal strip is then inserted into the rear panel and can be secured using the hold down screws.

Pin Number	Pin Name	Pin Description
1	GPI 1	General Purpose Input 1
2	GPI 2	General Purpose Input 2
3	GPI 3	General Purpose Input 3
4	GPI 4	General Purpose Input 4
5	GPI 5	General Purpose Input 5
6	GPI 6	General Purpose Input 6
7	GPI 7	General Purpose Input 7
8	GPI 8	General Purpose Input 8
9	GPI 9	General Purpose Input 9
10	GPI 10	General Purpose Input 10
11	GPI 11	General Purpose Input 11
12	GPI 12	General Purpose Input 12

**Table 2-1: Upper Left 2x6 Terminal Block
Connector Pin Assignments**

Preliminary

Pin Number	Pin Name	Pin Description
1	GPI 11	General Purpose Input 11
2	GPI 12	General Purpose Input 12
3	GPI 13	General Purpose Input 13
4	GPI 14	General Purpose Input 14
5	GPI 15	General Purpose Input 15
6	GPI 16	General Purpose Input 16
7	GPI 17	General Purpose Input 17
8	GPI 18	General Purpose Input 18
9	GPI 19	General Purpose Input 19
10	GPI 20	General Purpose Input 20
11	GND	Ground
12	GND	Ground
13	GPO:COM	General Purpose Output Common
14	GND	Ground
15	GPO1:NC	General Purpose Output 1 – Normally Closed
16	GPO2:NC	General Purpose Output 2 – Normally Closed
17	GPO1:NO	General Purpose Output 1 – Normally Open
18	GPO2:NO	General Purpose Output 2 – Normally Open
19	GPO3:NC	General Purpose Output 3 – Normally Closed
20	GPO4:NC	General Purpose Output 4 – Normally Closed
21	GPO3:NO	General Purpose Output 3 – Normally Open
22	GPO4:NO	General Purpose Output 4 – Normally Open
23	GND	Ground
24	GND	Ground
25	GPO5:NC	General Purpose Output 5 – Normally Closed
26	GPO6:NC	General Purpose Output 6 – Normally Closed
27	GPO5:NO	General Purpose Output 5 – Normally Open
28	GPO6:NO	General Purpose Output 6 – Normally Open
29	GPO7:NC	General Purpose Output 7 – Normally Closed
30	GPO8:NC	General Purpose Output 8 – Normally Closed
31	GPO7:NO	General Purpose Output 7 – Normally Open
32	GPO8:NO	General Purpose Output 8 – Normally Open
33	GND	Ground
34	GND	Ground

**Table 2-2: Lower Left 2x17 Terminal Block
Connector Pin Assignments**

Pin Number	Pin Name	Pin Description
1	TX A	Serial Port A Transmit
2	RX A	Serial Port A Receive
3	TX+ A	Serial Port A Transmit (RS-422)
4	RX+ A	Serial Port A Receive (RS-422)
5	GND	Ground
6	GND	Ground
7	TX B	Serial Port B Transmit
8	RX B	Serial Port B Receive
9	TX+ B	Serial Port B Transmit (RS-422)
10	RX+ B	Serial Port B Receive (RS-422)
11	GND	Ground
12	GND	Ground
13	TX C	Serial Port C Transmit
14	RX C	Serial Port C Receive
15	TX+ C	Serial Port C Transmit (RS-422)
16	RX+ C	Serial Port C Receive (RS-422)
17	---	No Connect
18	---	No Connect
19	---	No Connect
20	---	No Connect
21	GND	Ground
22	GND	Ground
23	TX D	Serial Port D Transmit
24	RX D	Serial Port D Receive
25	GND	Ground
26	GND	Ground
27	---	No Connect
28	---	No Connect
29	---	No Connect
30	---	No Connect
31	GND	Ground
32	GND	Ground
33	---	No Connect
34	---	No Connect

Table 2-3: Lower Right 2x17 Terminal Block Connector Pin Assignments

2.2. GENERAL PURPOSE INPUTS & OUTPUTS

The GPI inputs are active low with internal pull-ups. If an input is left floating (not connected) it will not be activated. Lowering the GPI input to a voltage below 0.8 volts will activate the input. GPIs can be activated by simply connecting the GPI input pins to ground using a button, switch, relay, or an open collector transistor. The inputs are internally pulled up to either +5 or +12 volts DC set by jumper J10 (please refer to Figure 6-1).

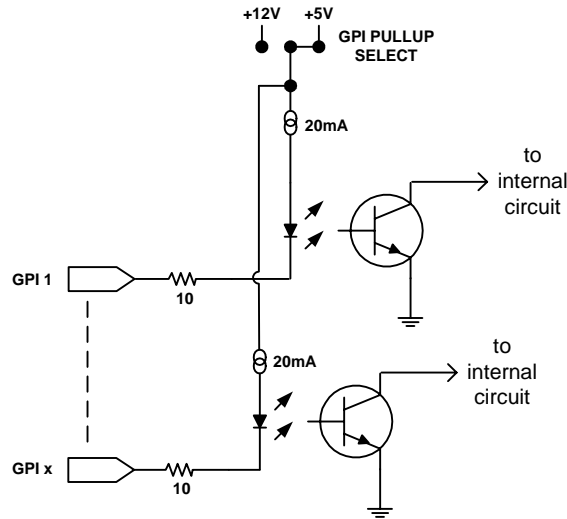


Figure 2-2: Typical GPI Circuitry

The GPO outputs are normally closed and normally open dry relay contacts and share a common connection which can be tied to the module ground or to another reference voltage.

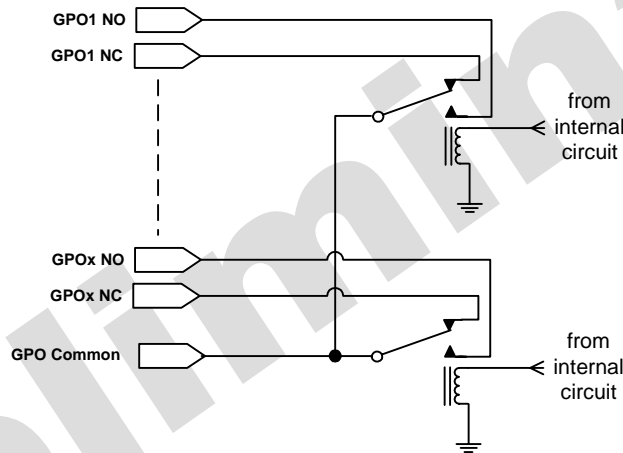


Figure 2-3: Typical GPO Circuitry

2.3. CONFIGURING THE MODULE OVER AN RS-232 SERIAL CONNECTION

Through the card-edge's serial port, and using the serial 7700 upgrade cable connected to a PC's serial port running HyperTerminal (or equivalent), the 7700tpi module's IP address, subnet, and SNMP TRAP destination address are identified. The 7700 upgrade cable supplied with the 7700FR-C frame is a multi-colored ribbon cable with a six pin header socket on one end and a female 9 pin D connector on the other end, (Evertz part number WA-S76) is normally in the vinyl pouch at the front of the manual binder. Configure the port settings of the terminal program as follows:

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

Table 2-4: 7700TPI Configuration COM Settings

Press the <Enter> key to see the main Menu. In the Main Menu, the following options are present for module configuration. Once changes completed and saved, the 7700tpi module should be power-cycled for the changes to take effect.

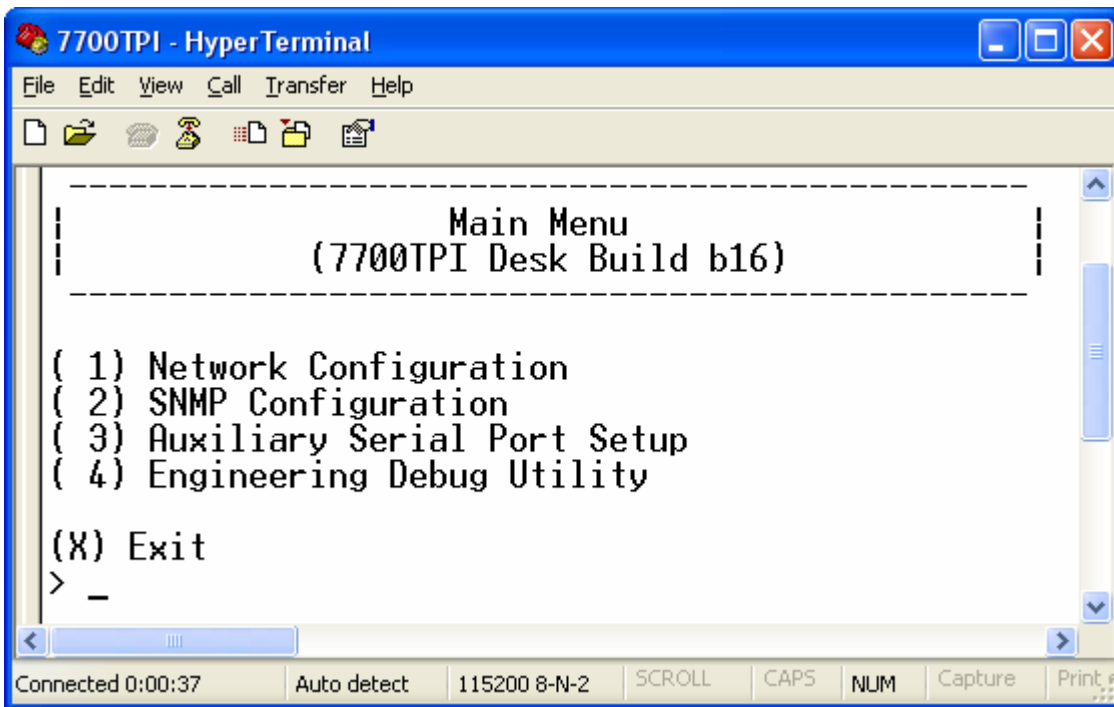


Figure 2-4: 7700TPI Main Menu

2.3.1. Network Configuration Menu

This menu option is used to configure the network IP settings of the module. Refer to Figure 2-5

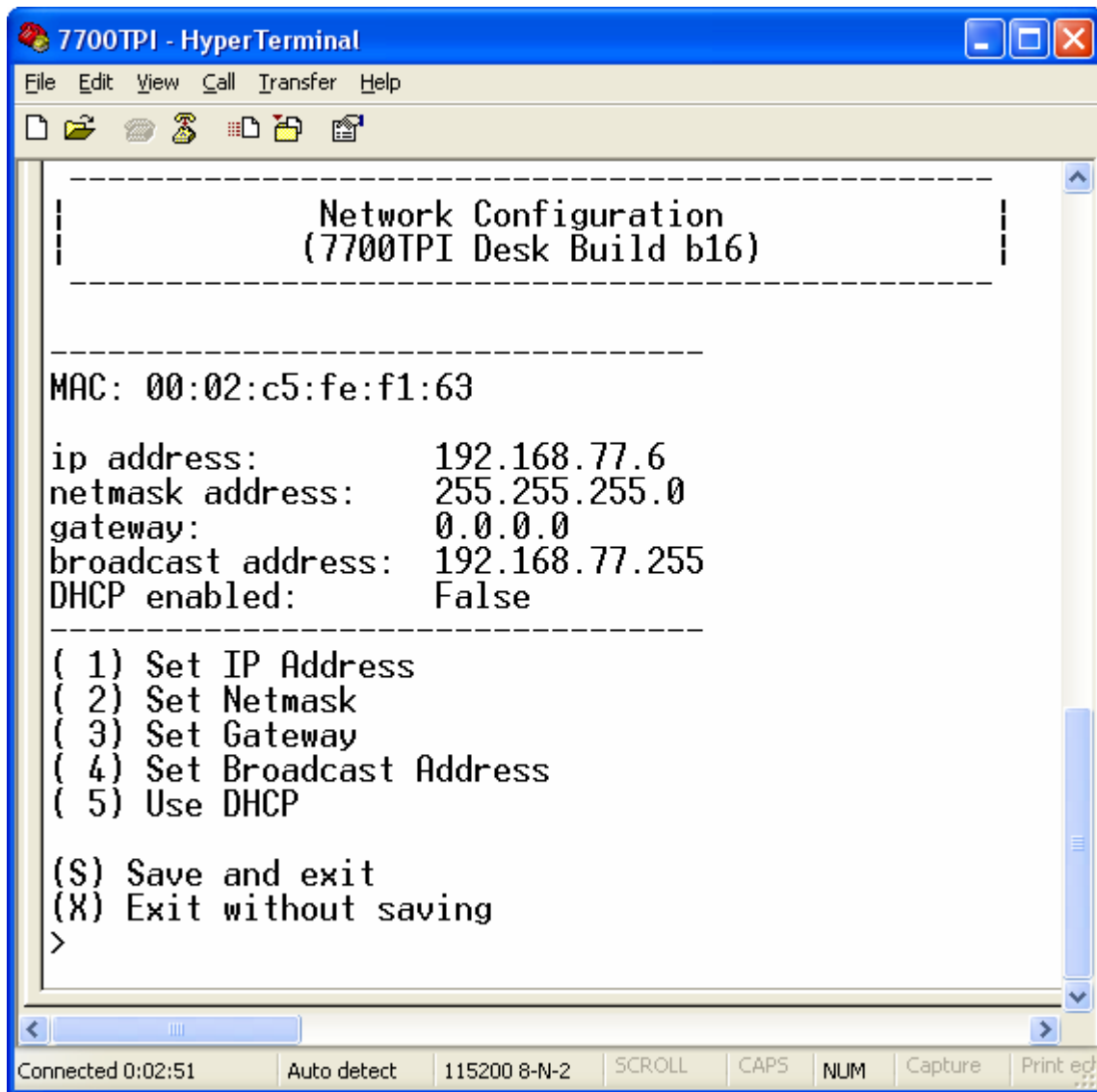


Figure 2-5: 7700TPI Network Configuration Menu

2.3.2. SNMP Configuration Menu

This menu option is used to configure the SNMP settings of the module. A maximum of 5 SNMP trap destinations can be configured. Refer to Figure 2-6.

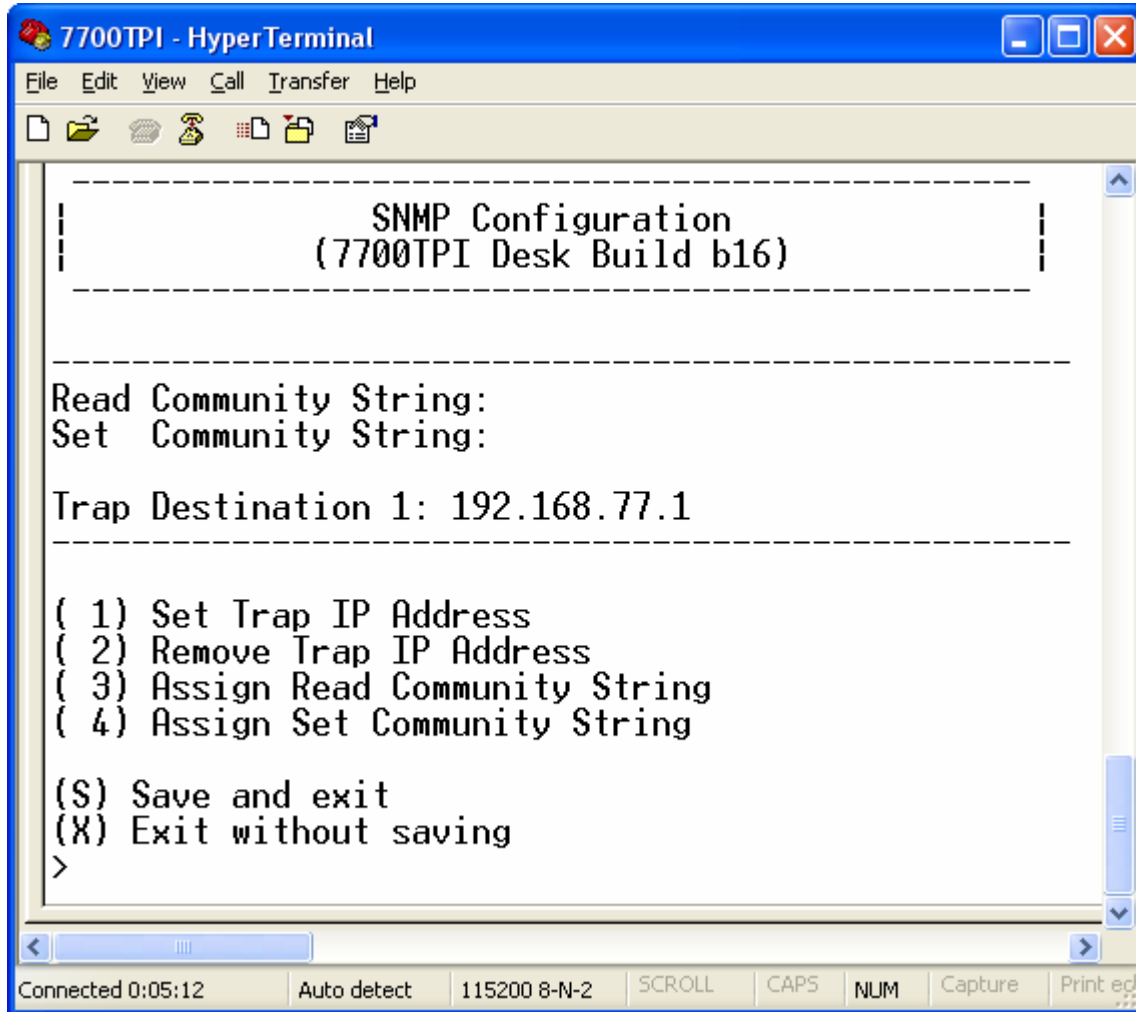


Figure 2-6: 7700TPI SNMP Configuration Menu

2.3.3. Auxiliary Serial Port Configuration Menu

This menu option is used to configure the serial port settings of the module. Refer to Figure 2-7.

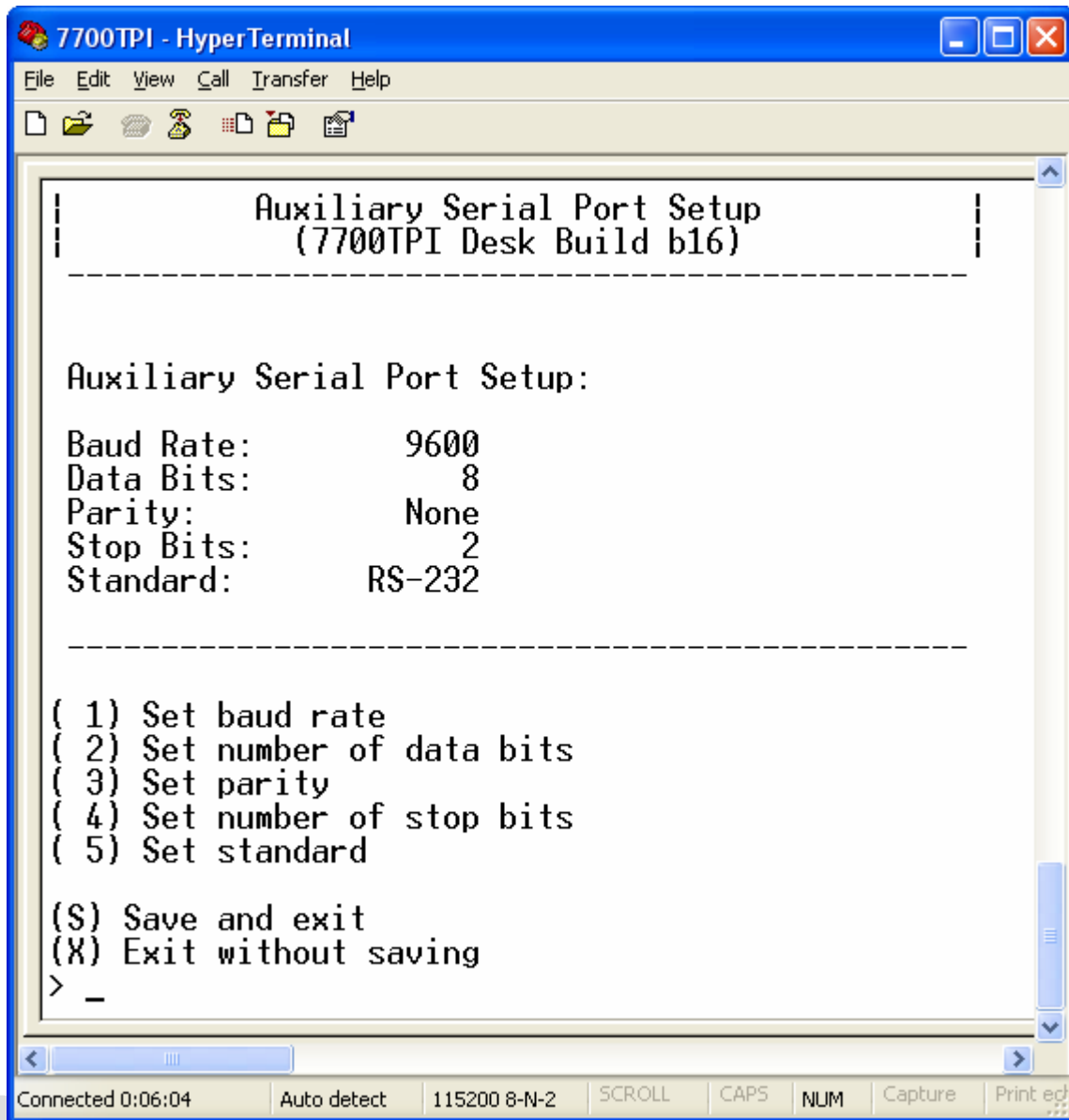


Figure 2-7: 7700TPI Auxiliary Serial Port Configuration Menu

3. SPECIFICATIONS

3.1. GENERAL PURPOSE INTERFACE INPUTS

Number of Inputs	20
Type	Opto-isolated, active low with jumper selectable +5V or +12V supplied voltage
Connector	Terminal Block
Signal Level	Jumper selectable +5V or +12V

3.2. GENERAL PURPOSE INTERFACE OUTPUTS

Number of Outputs	8
Type	“Dry Contact” relay closure
Connector	2 pins per output on Terminal Block
Signal Level	Normally Closed and Normally Open

3.3. DATA INPUT SERIAL PORT

Number of Ports	4 RS-232 or 3 RS-422
Connector	Terminal Block
Baud Rate	User selectable, up to 115200 bps

3.4. ELECTRICAL

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

3.5. PHYSICAL

7700 frame mounting:
Number of slots: 2

7701 frame mounting:
Number of slots: 1

Stand Alone Enclosure:

Dimensions:	14" L x 4.5" W x 1.9" H (355 mm L x 114 mm W x 48 mm H)
Weight:	approx. 1.5 lbs. (0.7 Kg)

4. STATUS INDICATORS

The 7700TPI modules have a number of LED Status indicators on the card edge of the board to show operational status of the card at a glance. Refer to Figure 4-1.

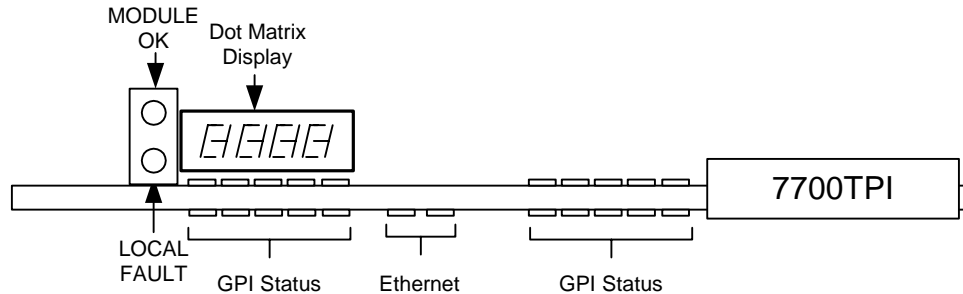


Figure 4-1: LED Status Indicators and Card Edge Controls

Two large LEDs on the front of the board indicate the general health of the module.

- LOCAL FAULT:** This red LED indicates poor module health and will be ON during the absence of a valid input signal or if a local input power fault exists (i.e.: a blown fuse). The LOCAL FAULT indication can also be reported to the frame through the FRAME STATUS jumper.
- MODULE OK:** This green LED indicates good module health. It will be ON when a valid input signal is present on both inputs, and the board power is good.
- DOT MATRIX:** This display will provide high level system information, such as product ID, firmware version and IP address. This information will be scrolling across the display.
- GPI STATUS:** These green LEDs indicate when a GPI has been asserted. There are 20 LEDs, each mapping to a unique GPI.
- ETHERNET:** These 2 green LEDs indicate when Ethernet activity is detected.

5. CARD EDGE CONTROLS

The 7700TPI modules are equipped with a toggle switch. This control can be found towards the top of the module when inserted within a 7700FR-C frame. Refer to Figure 5-1.

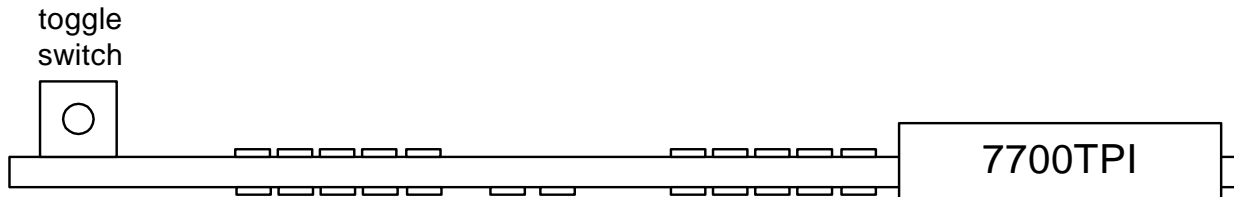


Figure 5-1: Card Edge Controls

TOGGLE SWITCH: This control is used to factory reset the module during the boot sequence.

6. LOCATION OF LEDS AND JUMPERS

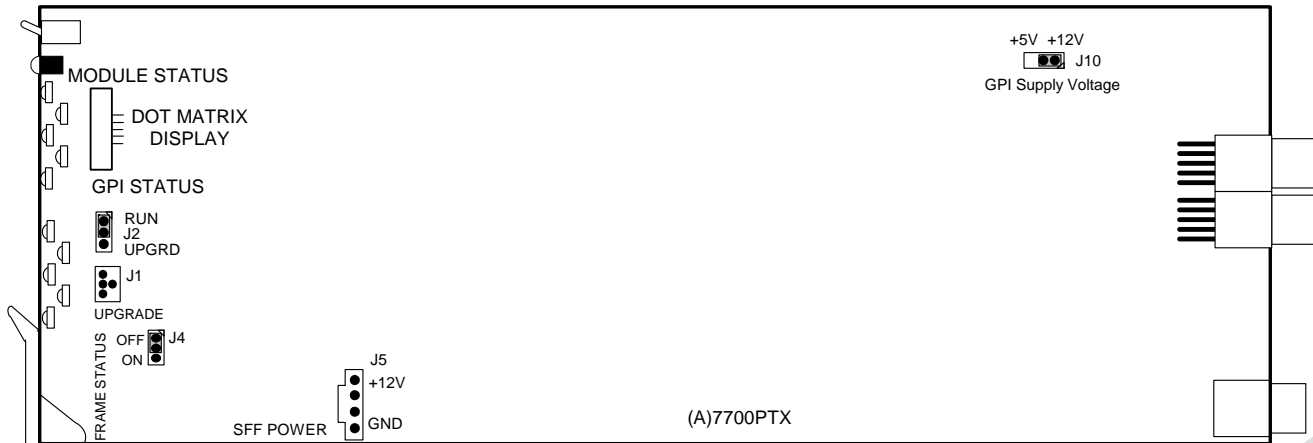


Figure 6-1: LED and Jumper Locations

6.1. SELECTING WHETHER LOCAL FAULTS WILL BE MONITORED BY THE GLOBAL FRAME STATUS

FRAME STATUS: The FRAME STATUS jumper located at the front of the module determines whether local faults (as shown by the Local Fault indicator) will be connected to the 7700FR-C frame's global status bus.

To monitor faults on this module with the frame status indicators (on the PS FRAME STATUS LED's and on the Frame's Fault Tally output) install this jumper in the On position. (Default)

When this jumper is installed in the Off position, local faults on this module will not be monitored.

6.2. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

The 7700TPI module contains firmware that is contained in a FLASH EPROM device. From time to time firmware updates will be provided to add additional features to the unit.

There are two methods of updating the firmware in the 7700TPI: File Transfer Protocol (FTP) and Serial Upload. To minimize upgrade wait time, the FTP method is the preferred method of updating the firmware.

Prior to initiating the upgrade process:

- Confirm the version of code currently installed on the unit by using the front panel display.
- Download the new application code from the Evertz FTP site (www.evertz.com) Unzip the file into a temporary working folder on your PC.

You will need the following equipment in order to update the Firmware:

- PC with available communications port and Ethernet network port.
- “Straight-thru” serial extension cable (DB9 female to DB9 male) or (DB25 female to DB9 male).
- Special upgrade cable supplied with the 7700FR-C frame. This multi-colored ribbon cable with a six pin header socket on one end and a female 9 pin D connector on the other end, (Evertz part number WA-S76) is normally in the vinyl pouch at the front of the manual binder.
- Appropriate Ethernet cable as outlined in section 6.2.1.2
- Terminal program such as HyperTerminal
- New firmware supplied by Evertz.

6.2.1. Upgrading the Firmware Using FTP

6.2.1.1. Determine the IP Address of the Module

Before any FTP (file transfer protocol) upgrades can be initiated, the user must determine the IP address of the module. The IP address can be found scrolling across the card edge dot matrix display, or alternatively refer to section 2.3.1 to recall the IP address.

6.2.1.2. Establishing a Valid Network Connection

Before upgrading the unit, a valid network connection must be determined.

1. Connect a PC/Laptop to the same network the 7700TPI module resides. If connecting directly to the module then a crossover network cable must be used.
2. Open a DOS window. This can be accomplished by using the run command under the start button, type “cmd”; see figure below for an example:

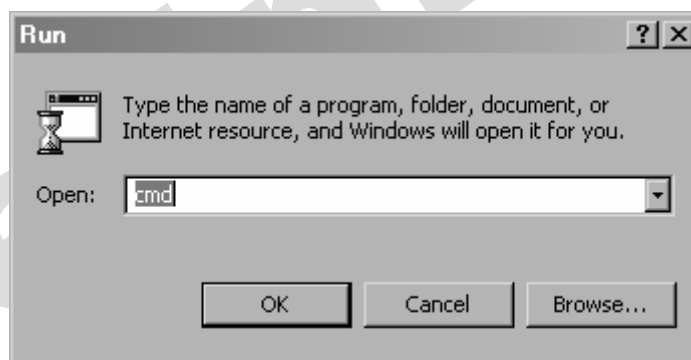
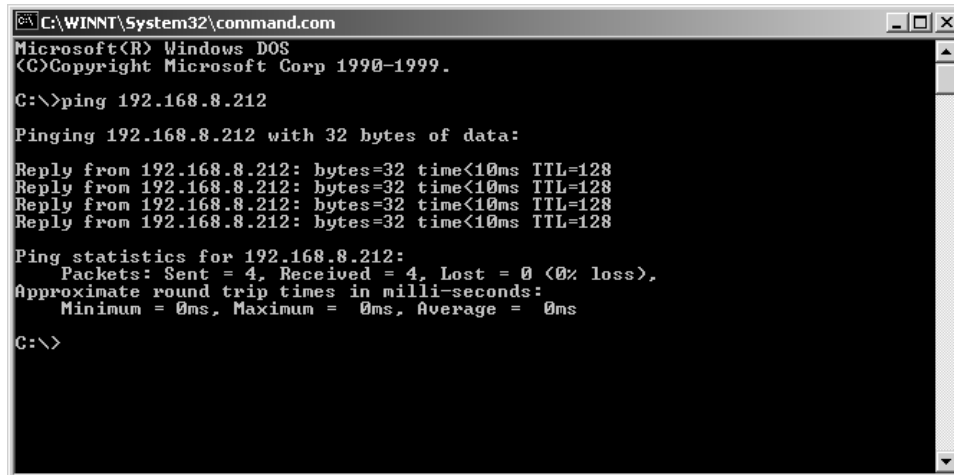


Figure 6-2: Opening a DOS Command Window

3. “Ping” the IP address of the module being upgraded to confirm that you have a valid network connection. In the command prompt window type: `ping xxx.xxx.xxx.xxx <Enter>` (IP address of the module)

If a proper network connection has been established, a “reply” is displayed on the DOS window. If there is a faulty network connection, a “Destination Host Unreachable” message is provided. If this occurs, both IP addresses of the nodes should be verified or the network (Ethernet) cable may be faulty.



```
C:\WINNT\System32\command.com
Microsoft(R) Windows DOS
(C)Copyright Microsoft Corp 1990-1999.

C:\>ping 192.168.8.212

Pinging 192.168.8.212 with 32 bytes of data:

Reply from 192.168.8.212: bytes=32 time<10ms TTL=128
Reply from 192.168.8.212: bytes=32 time<10ms TTL=128
Reply from 192.168.8.212: bytes=32 time<10ms TTL=128
Reply from 192.168.8.212: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.8.212:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Figure 6-3: Pinging a 7700TPI Module

6.2.1.3. FTP Upgrade

Using the same DOS command prompt from the previous section, apply the following steps to upgrade the 7700TPI module.

1. Obtain the new application code and place it on the local drive of the PC
2. In the command prompt window type: `ftp xxx.xxx.xxx.xxx` (IP address of the module)
3. Press the <Enter> key when prompted for a “Username”.
4. Press the <Enter> key when prompted for a “Password”. A message indicating that you logged in is displayed.
5. At the “FTP>” prompt type `hash` to turn on the progress indicator during the ftp upload.
6. At the “FTP>” prompt type `quote site upgrade` to put the unit in upgrade mode. A message indicating that you are in upgrade mode is displayed.
7. At the “FTP>” prompt type: `put "the name of the file.bin"` to send the firmware to the unit. (For example: `put 7700tpi-1.0.0.bin`)



If the application file is not local to where you are performing the ftp, then include the path with the name (For example: `put c:\firmware\ 7700tpi-1.0.0.bin`)



During this time it is mandatory that all power cycles of the unit be avoided. The figure below displays a successful FTP session.

6.2.1.4. Completing the FTP Upgrade

At this point the firmware has been accepted by the 7700TPI module. For the new firmware to take affect, and reboot of the module is required. This can be done by removing the module from the 7700FR-C frame and re-inserting the module. Please ensure that the 7700TPI module has been firmly seated into place and proper contact has been made with the rear plate.

6.2.2. Upgrading the Firmware Over an RS-232 Serial Connection

UPGRADE: The UPGRADE jumper J2 located at the front edge of the module, near the serial port header, is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* section in the front of the binder for more information.

To upgrade the firmware in the module pull it out of the frame. Move Jumper J2 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of this manual) onto header J1 near the card ejector. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* section in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J2 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.



Note that the baud rate for serial firmware upgrades is 115200 baud.

6.3. CONTROLLING GPI PULLUP VOLTAGE

Jumper J10, located at the rear of the module, controls whether the GPI inputs and outputs are pulled up to 5 volts or 12 volts.

GPI SELECT: To pull the GPI inputs and outputs up to 12 volts install this jumper in the position closest to the rear edge of the module.

To pull the GPI inputs and outputs up to 5 volts install this jumper in the position closest to the front edge of the module.

7. VISTALINK® REMOTE MONITORING/CONTROL

7.1. WHAT IS VISTALINK®?

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

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VistaLINK®-C Configuration Utility graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK® enabled products.
1. Managed devices (such as the 7700TPI module), each with a unique address (OID), communicate with the NMS through an SNMP Agent.
2. A virtual database known as the Management Information Base (MIB) lists all the variables being monitored and 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.

7.2. VISTALINK® MONITORED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface:

Parameter	Description
Card Type	Indicates the name of the module
Serial Number	Indicates the serial number of the module
Firmware Version	Indicates the card type (e.g. 7700R2X2-HD, 7700R2X2-HES)
GPI Status	Indicated the current state of a GPI

Table 7-1: VistaLINK® Monitored Parameters

7.3. VISTALINK® CONTROLLED PARAMETERS

The following parameters can be remotely monitored through the VistaLINK® interface:

Parameter	Description
GPI Trap Enable	Sets a filter on the module, to decide whether or not a GPI trap is to be fired
GPO State	Sets the state of a GPO

Table 7-2: VistaLINK® Controlled Parameters

7.4. VISTALINK[®] TRAPS

Trap	Description
GPI	Triggers when a GPI is asserted

Table 7-3: VistaLINK[®] Traps

Preliminary

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