

TABLE OF CONTENTS

1.	GENERAL OVERVIEW OF 7700PTX	1
1.1.	OVERVIEW 7700PTX-GVTALLY	2
2.	CARD EDGE CONTROLS	3
2.1.	DETERMINING CURRENT IP ADDRESS SETTINGS	3
2.2.	RESTORING FACTORY DEFAULTS.....	3
2.3.	CARD EDGE LEDS.....	3
2.3.1.	Back Plate	4
3.	TECHNICAL SPECIFICATIONS	5
3.1.	ELECTRICAL	5
3.2.	ETHERNET	5
3.3.	PHYSICAL.....	5
4.	CONFIGURATION	7
4.1.	CONFIGURATION STEPS.....	7
4.2.	DEBUG/MONITOR PORT CONNECTION	8
4.3.	MAIN MENU.....	10
4.3.1.	Network Configuration.....	10
4.3.2.	GVTALLY StatServer Settings Setup	12
4.4.	UNDER MONITOR DISPLAY SETUP	15
4.4.1.	UMD Peer Setup via Ethernet 1	15
4.4.2.	UMD Justification Setup	16
5.	WEB INTERFACE.....	17
5.1.1.	GV Ethernet Tally Setup.....	18
5.1.2.	Under Monitor Setup	20
5.2.	MAGNUM TALLY	20
6.	TROUBLESHOOTING TIPS	21
6.1.	CHECKING SWITCHER COMMUNICATION.....	21
6.2.	CHECKING UMD COMMUNICATION.....	22
7.	PERFORMING A FIRMWARE UPGRADE.....	23
7.1.	FTP PROCEDURE	23
7.2.	SERIAL PROCEDURE.....	24

Figures

Figure 1-1: 7700PTX-GVTALLY Environment with MVP	2
Figure 2-1: PTX Card Edge	3
Figure 2-2: 7700PTX Back Plate	4
Figure 4-1: COM1 Properties Window.....	9
Figure 4-2: Serial Configurations - Ethernet Setup	11
Figure 4-3: Serial Configuration – StatServer Settings	12
Figure 4-4: Tally Info Transmission	13
Figure 4-6: Serial Configuration – Under Monitor Display Peer Setup.....	15
Figure 4-7: Serial Configuration – UMD Peer Setup via Ethernet 1	15
Figure 4-8: UMD Peer Configuration	15
Figure 4-9: Under Monitor Setup page	20
Figure 5-1: GVTALLY Status	21
Figure 5-2: UMD Peer Status.....	22

Tables

Table 4-1: 7700PTX-GVTALLY Main Menu.....	10
Table 4-5: GVTALLY Source Number to Program VGPI Mapping	13

REVISION HISTORY

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1. GENERAL OVERVIEW OF 7700PTX

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 *VistaLINK*® 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 *VistaLINK*® to control third-party devices such as satellite controllers.

Features:

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

1.1. OVERVIEW 7700PTX-GVTALLY

The 7700PTX-GVTALLY connects to a Grass Valley K-frame switcher via a TCP link to receive tally information and pushes tally information to a MVP or Magnum Server via a TCP link as shown in Figure 1-1.

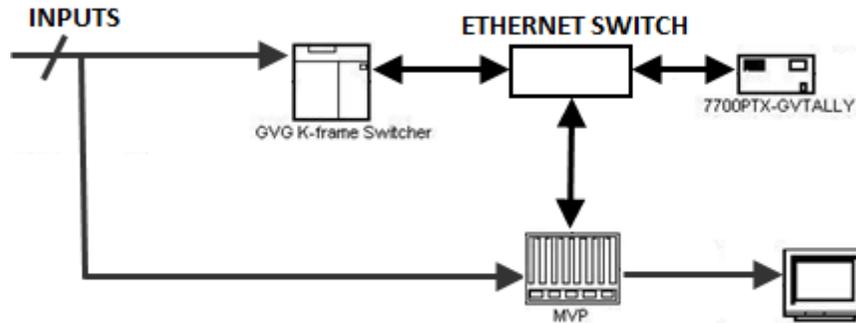


Figure 1-1: 7700PTX-GVTALLY Environment with MVP

The function of the 7700PTX-GVTALLY is to monitor the Grass Valley Ethernet Tally Protocol to:

- 1) Determine which, if any, of the switcher's 192 inputs is contributing to one or more of the 96 switcher outputs.
- 2) Convey the information via TCP to the display card of an MVP using Image Video protocol and to Magnum tally using Server Notification protocol.

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.

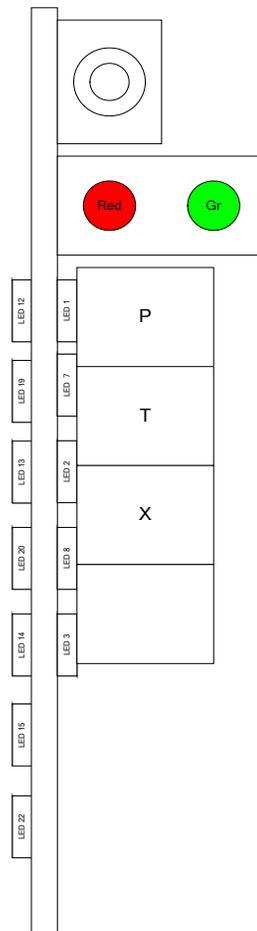


Figure 2-1: PTX Card Edge

2.3.1. Back Plate

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

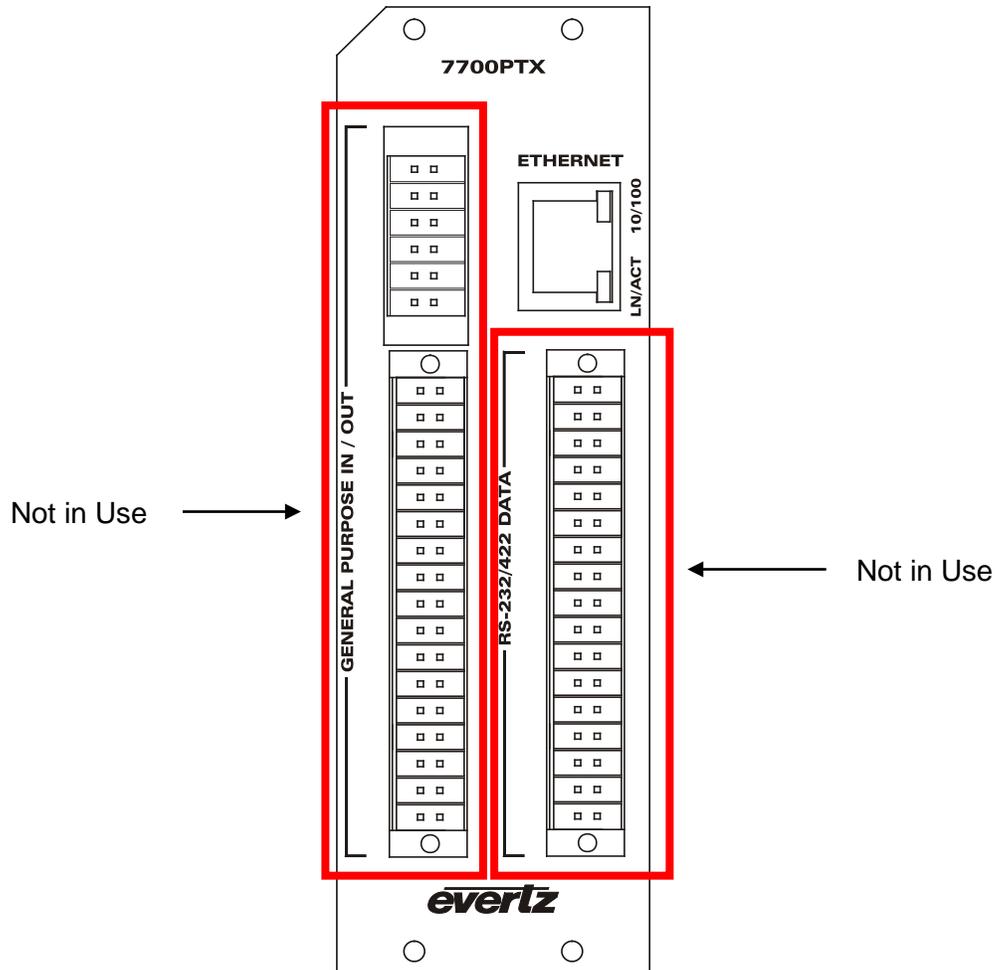


Figure 2-2: 7700PTX Back Plate

Ethernet Port: 1 RJ45 Ethernet port used to configure and interface the 7700PTX with other third party devices.

3. TECHNICAL SPECIFICATIONS

3.1. 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

3.2. ETHERNET

Network Type: IEEE 802.3 (10BASE-T)
IEEE 802.3u (100BASE-TX)
Connector: RJ-45

3.3. PHYSICAL

Number of Slots: 2

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4. CONFIGURATION

4.1. CONFIGURATION STEPS

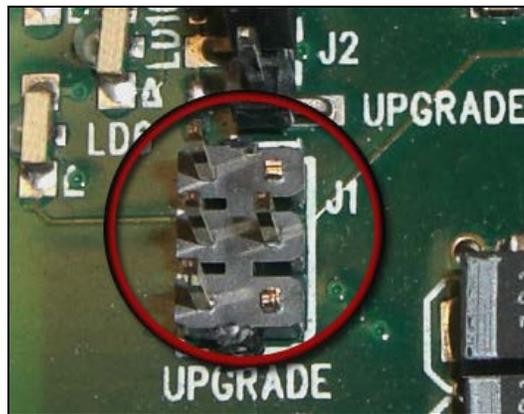
Perform the following steps to configure the 7700PTX-GVTALLY

1. Connect a PC running a console application to the PTX debug/monitor port via the adapter cable.
2. Configure the 7700PTX-GVTALLY's network parameters.
3. Configure the GVTALLY protocol parameters and default settings if required.
4. Configure the IP address and TCP port of the UMD peer(s).
5. Save all configuration parameters.
6. Power off the 7700PTX-GVTALLY.
7. Connect straight through ethernet cable from the 7700PTX-GVTALLY Ethernet port to the hub and from hub to the Switcher's Ethernet port.
8. Power on the 7700PTX-GVTALLY.

4.2. DEBUG/MONITOR PORT CONNECTION

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

1. Locate the small, keyed, four-pin end of the upgrade cable provided by Evertz.
2. Connect it to the four-pin interface (J1) near the front of the 7700PTX, directly above the card unlock latch.



3. Connect the other end of the upgrade cable to a straight-through serial cable. Connect the serial cable to the serial or COM port of the computer.
4. On the computer click "Start\Programs\Accessories\Communications\HyperTerminal".
5. Enter a name for your connection, for example: PTX.
6. Press the <Enter> key. A new "Connect To" window will open.



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

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

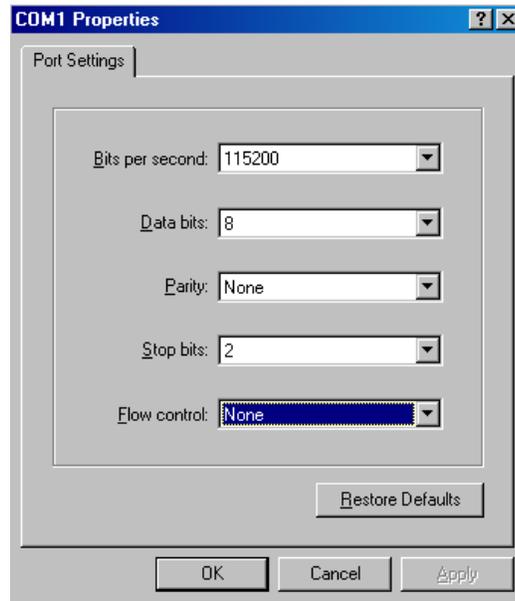


Figure 4-1: COM1 Properties Window

9. Enter the information as listed in Figure 4-1.
10. Press the <Enter> key or click OK. The “COM Properties” window closes, leaving the HyperTerminal window open.
11. Apply power to the 7700PTX if it is not powered on. The boot sequence and Main Menu are displayed in the HyperTerminal window.
12. If the 7700PTX is powered on, hit the <Enter> key to view the 7700PTX’s menu system.
13. Various 7700PTX parameters are configurable via the 7700PTX’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-GVTALLY's *Main Menu*.

Entry	Item	Notes
1	Network Configuration	IP address, subnet mask, gateway, etc.
2	Serial Port Setup	<i>(Not used on the GVTALLY)</i>
3	GVTALLY StatServer Settings Setup	Parameters pertaining to the GVTALLY Protocol.
5	Under Monitor Display Setup	IP address and TCP port of UMD peers.
6	Engineering/Debug	Used for troubleshooting

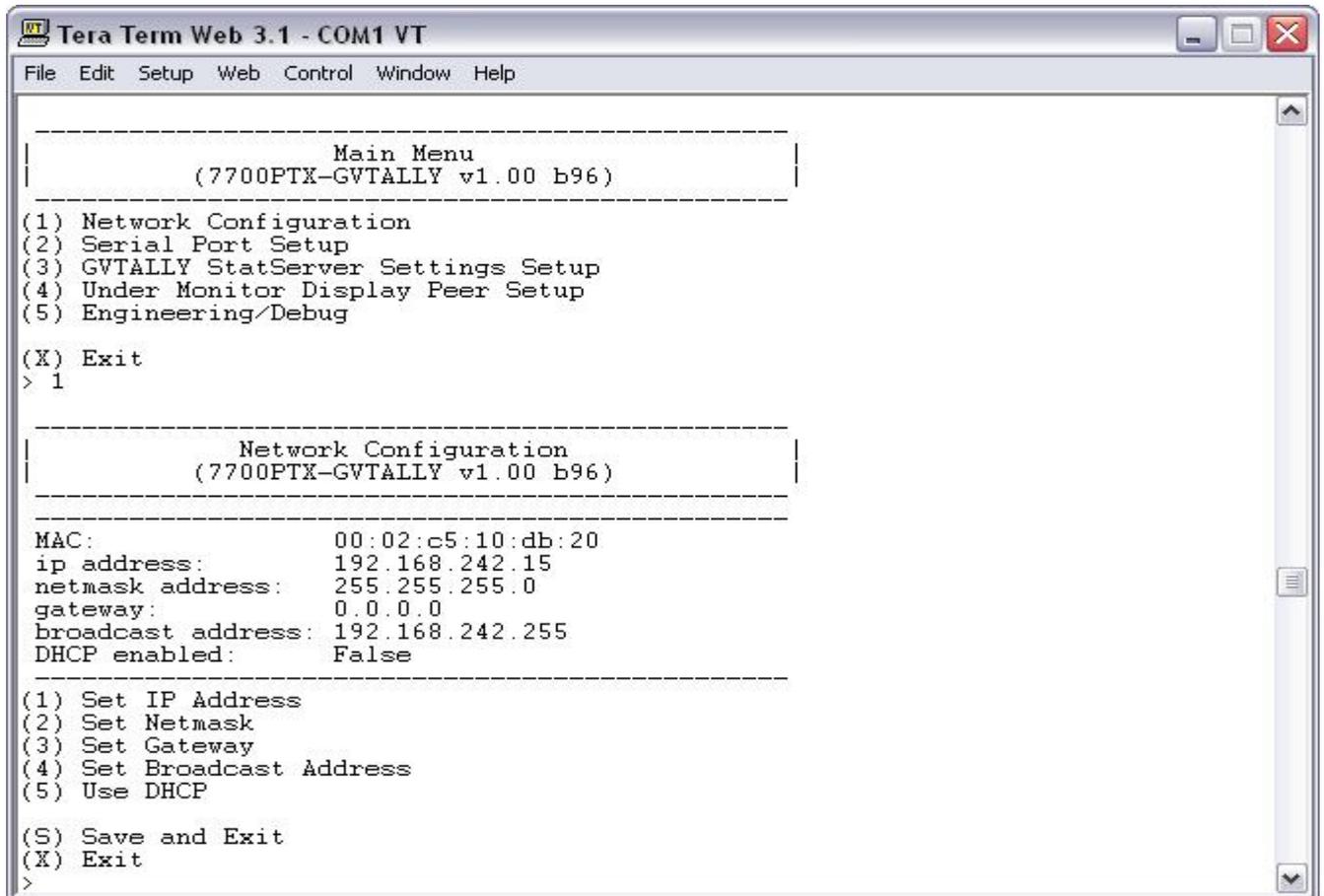
Table 4-1: 7700PTX-GVTALLY Main Menu

4.3.1. Network Configuration

1. From the *Main Menu* select *Network Configuration*. Figure 4-2 will be displayed.
2. If DHCP (Dynamic Host Configuration Protocol) is desired, then the “*Use DHCP*” field needs to be set to “*True*”. Otherwise, the IP address, subnet mask, and gateway are configured 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*”. Unit needs to be rebooted for changes to take effect.



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



The screenshot shows a terminal window titled "Tera Term Web 3.1 - COM1 VT" with a menu-driven interface. The main menu is displayed, and option (1) "Network Configuration" has been selected. The network configuration screen shows the following settings: MAC: 00:02:c5:10:db:20, ip address: 192.168.242.15, netmask address: 255.255.255.0, gateway: 0.0.0.0, broadcast address: 192.168.242.255, and DHCP enabled: False. The user has selected option (1) "Set IP Address".

```
Tera Term Web 3.1 - COM1 VT
File Edit Setup Web Control Window Help

-----
|                               |
|           Main Menu          |
| (7700PTX-GVTALLY v1.00 b96) |
|                               |
| (1) Network Configuration    |
| (2) Serial Port Setup       |
| (3) GVTALLY StatServer Settings Setup |
| (4) Under Monitor Display Peer Setup |
| (5) Engineering/Debug      |
|                               |
| (X) Exit                    |
| > 1                         |
|                               |
|-----
|                               |
|           Network Configuration |
| (7700PTX-GVTALLY v1.00 b96)   |
|-----
| MAC:          00:02:c5:10:db:20 |
| ip address:   192.168.242.15   |
| netmask address: 255.255.255.0 |
| gateway:     0.0.0.0          |
| broadcast address: 192.168.242.255 |
| DHCP enabled: False          |
|-----
| (1) Set IP Address            |
| (2) Set Netmask              |
| (3) Set Gateway              |
| (4) Set Broadcast Address    |
| (5) Use DHCP                 |
|                               |
| (S) Save and Exit           |
| (X) Exit                    |
| >                             |
```

Figure 4-2: Serial Configurations - Ethernet Setup

4.3.2. GVTALLY StatServer Settings Setup

Settings for the 7700PTX-GVTALLY can be configured through this menu on the serial port or using the preferred method using the Web interface in section 5. From the main menu, select “GVTALLY StatServer Settings Setup”.

```
-----  
(1) Set Timeout  
(2) Set Serial/TCP  
(3) Set IP Address  
(4) Set TCP Port  
(5) Set what output to watch  
(6) Set the output VGPI offset  
(7) Set the Image Video Tally ID  
(8) Set the UMD Tally Refresh rate  
(9) Set the heartbeat poll deration  
(10) Set what suite to subscribe to  
(11) Set the total number of Inputs  
(12) Set the total number of Outputs  
  
(S) Save and Exit  
(X) Exit
```

Figure 4-3: Serial Configuration – StatServer Settings



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

<1> Set Timeout: If a request to the server takes longer then the time displayed then the 7700PTX-GVTALLY will attempt to reconnect to the server.

<2> Set Serial/TCP: This must be *enabled* for the 7700PTX-GVTALLY

<3> Set IP Address: The IP address of the GV system the 7700PTX-GVTALLY is getting tally information from.

<4> Set TCP Port: The port the 7700PTX-GVTALLY is going to get the tally information from.

In steps, **<5>** and **<6>**, for each output port there is a watched and VGPI offset option.

<5> Set what output to watch: Watched simply configures whether or not that port will have its tallies calculated.

<6> Set the output VGPI offset: The VGPI offset is used to insure that if multiple ports are being watched none of there VGPI ids will overlap. To insure no overlap each VGPI offset needs to be unique and a multiple of the maximum number of inputs.

For example:

This is the value added to the switcher’s source number to obtain the program VGPI number that the 7700PTX-GVTALLY transmits to the PPV(s). Table 4-5 shows the default offset (0) as well as a user-defined offset (1).

GVTALLY 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 4-2: GVTALLY Source Number to Program VGPI Mapping

<7> Set the Image Video Tally ID: This is the display ID used when sending tally information to the UMD devices.

<8> Set the UMD Tally Refresh rate: This is the amount of time between resending the tally and name status to the UMDs if nothing has changed.

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

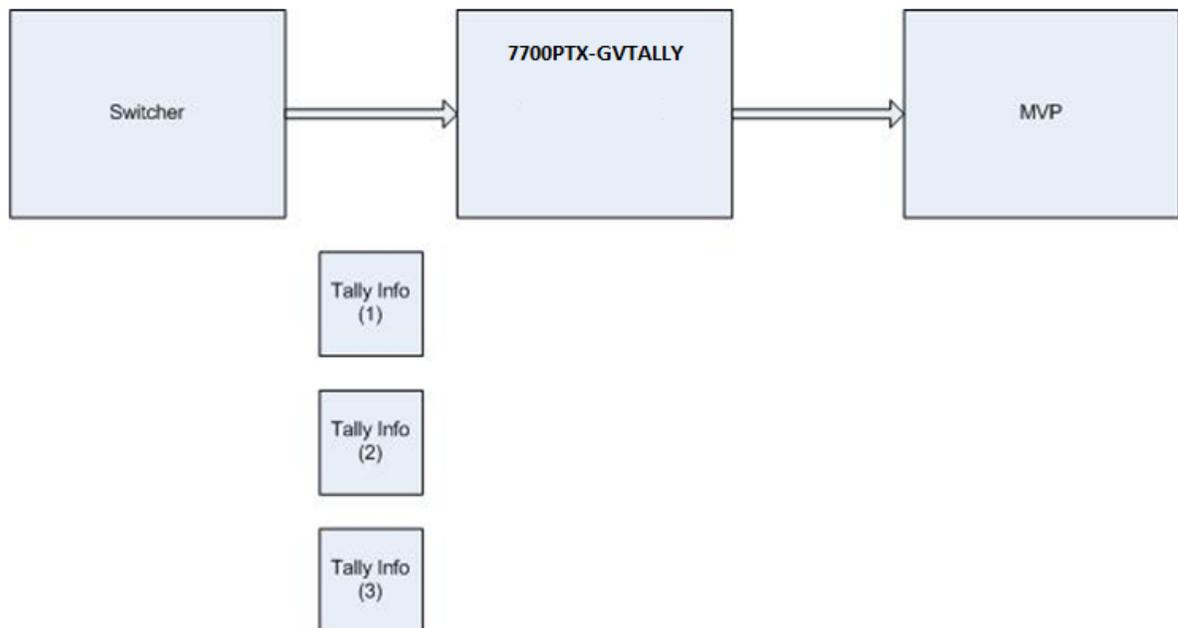


Figure 4-4: Tally Info Transmission

The VGPI refresh count parameter specifies how many iterations of non-changing tally information the 7700PTX-GVTALLY receives before it provides a VGPI refresh to the MVP. For instance, if the VGPI refresh time is set to 10,000 it means the 7700PTX-GVTALLY will receive the unchanging tally information for 10 seconds before it sends a VGPI refresh to the MVP. The VGPI refresh is beneficial should the MVP lose power.

<9> Set the heartbeat poll duration: Sets the amount of time between polls to check if the GV switcher is still connected. (**Note: must be set to zero for current firmware**)

<10> Set what suite to subscribe to: Subscribing for "All" is usual and the default setting. Options are *1, 2, All, None or the Suite name*.

<11> Set the total number of Inputs: This is the total number of switcher inputs, most of the time this will be the maximum value.

<12> Set the total number of Outputs: This is the total number of switcher outputs, most of the time this will be the maximum value.

4.4. UNDER MONITOR DISPLAY SETUP

Settings for the UMD Peer Setup can be configured through this menu on the serial port or using the preferred method using the Web interface in section 5. From the main menu, select “*Under Monitor Display Peer Setup*”. There will be two selections that a user can choose as in Figure 4-6.

```

-----
:           Under Monitor Display Peer Setup           :
:           <7700PTX-GVTALLY v1.01 b1>               :
-----
<1> UMD Peer Setup via Ethernet 1
<2> UMD Justification Setup

<X> Exit
  
```

Figure 4-5: Serial Configuration – Under Monitor Display Peer Setup

4.4.1. UMD Peer Setup via Ethernet 1

```

-----
:           UMD Peer Setup via Ethernet 1             :
:           <7700PTX-GVTALLY v1.01 b1>               :
-----
<1> Peer 1 Setup
<2> Peer 2 Setup
<3> Peer 3 Setup
<4> Peer 4 Setup
<5> Peer 5 Setup
<6> Peer 6 Setup
<7> Peer 7 Setup
<8> Peer 8 Setup
<9> Peer 9 Setup
<10> Peer 10 Setup
<11> Peer 11 Setup
<12> Peer 12 Setup
<13> Show all setups

<X> Exit
  
```

Figure 4-6: Serial Configuration – UMD Peer Setup via Ethernet 1

Suppose we have the setup of Figure 4-8.

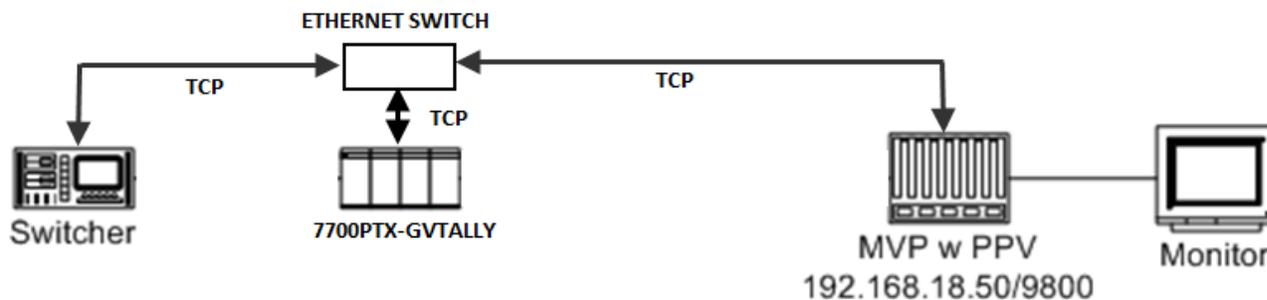


Figure 4-7: UMD Peer Configuration

The 7700PTX-GVTALLY 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-GVTALLY:

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

4.4.2. UMD Justification Setup

This allows the user to set the justification for all the UMD's as either *Left*, *Center* or *Right*.

5. WEB INTERFACE

The preferred, and fastest, means of setting up this panel is the web interface. Using a web browser enter in the IP address of the card, make sure the browser not using a proxy for this address. If the web browser can reach the card the following will be displayed.



Figure 3: Default page of the 7700PTX-GVTALLY

The links at the top of the page allows the user to navigate to any page supported on the 7700PTX-GVTALLY. The four pages are as follows:

- General Status, the default page with version and serial numbers displayed
- Serial Configuration, the Grass Valley Ethernet Tally protocol should not need this but it is an option if some products use the protocol over serial
- GV Tally Protocol Setup, the primary area where all Grass Valley Ethernet Tally protocol settings are changed
- Under Monitor Setup, allows the user to setup what UMDs the 7700PTX-GVTALLY will be using

In this document we will be concentrating on the GV Tally Protocol Setup and Under Monitor Setup pages.

5.1.1. GV Ethernet Tally Setup

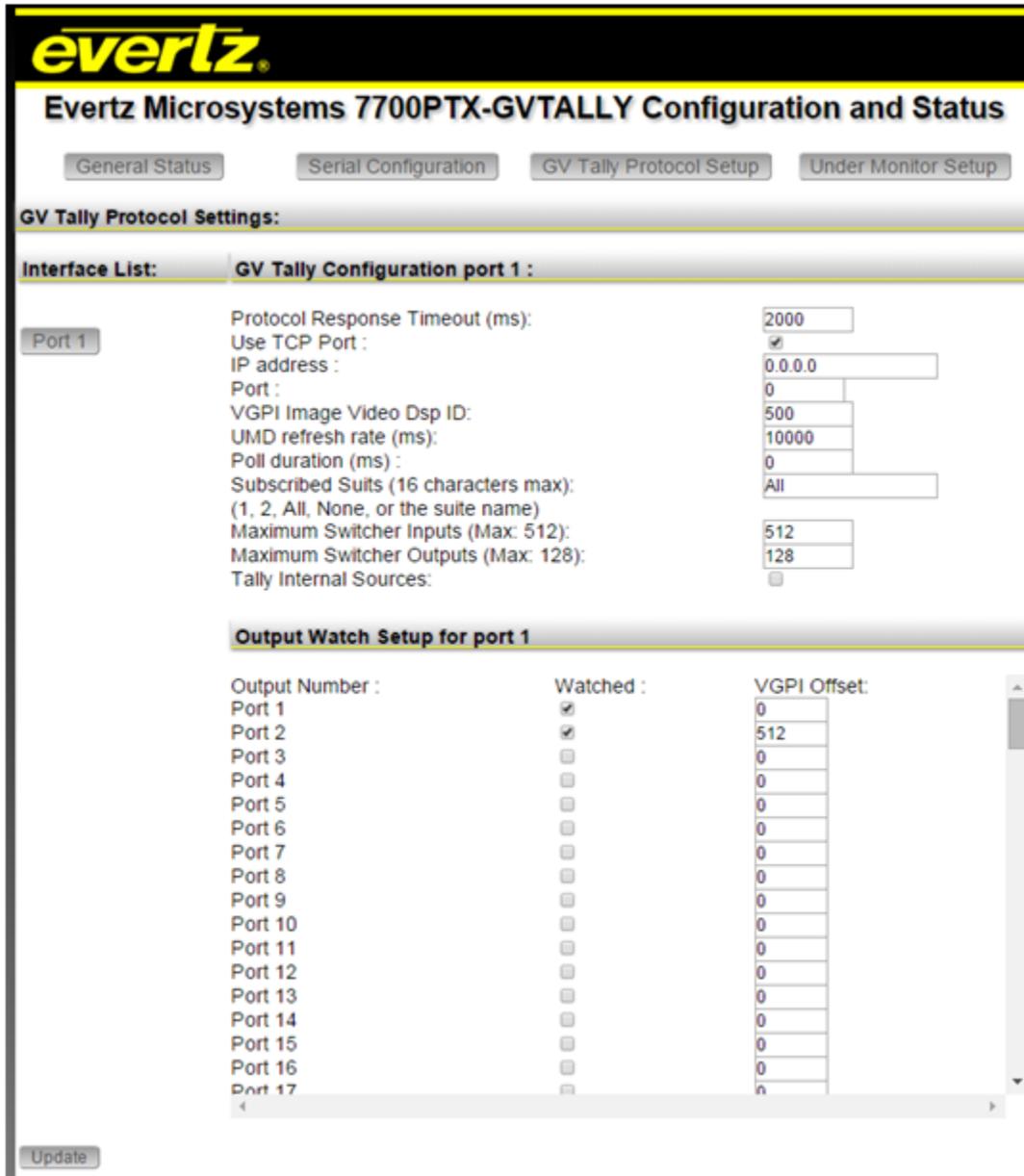


Figure 4: GV Ethernet Tally Setup web interface

In the above figure is the web interface to setup the tally protocol settings, the settings displayed are the default settings.

The GV Tally protocol settings are as follows:

- **Protocol Response Timeout:** if a request to the server takes longer then the time displayed then the 7700PTX-GVTALLY will attempt to reconnect to the server.
- **Use TCP Port:** This must be **enabled** for the 7700PTX-GVTALLY,

- **IP address:** The IP address of the GV system the 7700PTX-GVTALLY is getting tally information from.
- **Port:** the port the 7700PTX-GVTALLY is going to get the tally information from.
- **VGPI Image Video Dsp ID:** the display ID used when sending tally information to the UMD devices.
- **UMD refresh rate:** the amount of time between resending the tally and name status to the UMDs if nothing has changed.
- **Poll duration:** the amount of time between polls to check if the GV server is still connected. **(Note: this needs to be set to 0 for current firmware)**
- **Maximum Switcher Inputs:** the total number of switcher inputs, most of the time this will be the maximum value.
- **Maximum Switcher Outputs:** the total number of switcher outputs, most of the time this will be the maximum value.

The second part of the configuration is the output watch setup. This area sets up what outputs are going reported on with regards to what sources make up that output. For each output port there is a watched and VGPI offset option. Watched simply configures whether or not that port will have its tallies calculated. The VGPI offset is used to insure that if multiple ports are being watched none of there VGPI ids will overlap. To insure no overlap each VGPI offset needs to be unique and a multiple of the maximum number of inputs.

To commit changes simply click the “Update” button on the bottom of the web page and reboot the card. Once the card comes up the new settings will be used.

5.1.2. Under Monitor Setup

The screenshot shows the 'Under Monitor Setup' page. At the top, there is a yellow header with the 'evertz' logo. Below the header, the title 'Evertz Microsystems 7700PTX-GVTALLY Configuration and Status' is displayed. There are four tabs: 'General Status', 'Serial Configuration', 'GV Tally Protocol Setup', and 'Under Monitor Setup'. The 'Under Monitor Setup' tab is selected. Below the tabs, the section 'Under Monitor Display Peer Setup:' is shown. It contains a table with 12 rows, each representing a peer. Each row has four columns: 'Peer X:', 'IP Address', 'TCP Port', and 'Status'. The IP Address and TCP Port columns contain input fields with '0.0.0.0' and '0' respectively. The Status column contains the text 'Down'. Below the table, there is a dropdown menu for 'UMD justification:' set to 'Left' and an 'Update' button.

Peer X:	IP Address	TCP Port	Status
Peer 1:	0.0.0.0	0	Down
Peer 2:	0.0.0.0	0	Down
Peer 3:	0.0.0.0	0	Down
Peer 4:	0.0.0.0	0	Down
Peer 5:	0.0.0.0	0	Down
Peer 6:	0.0.0.0	0	Down
Peer 7:	0.0.0.0	0	Down
Peer 8:	0.0.0.0	0	Down
Peer 9:	0.0.0.0	0	Down
Peer 10:	0.0.0.0	0	Down
Peer 11:	0.0.0.0	0	Down
Peer 12:	0.0.0.0	0	Down

UMD justification: Left

Figure 4-1: Under Monitor Setup page

The Under Monitor Setup page allows the user to setup up to 12 UMD peers as well as setup justification for names (currently not used). To setup UMD peers enter the IP address of the device and the port that will receive the Image Video protocol. Once finished press the “Update” button and reboot the card. Once the card restarts it will try to establish comms with the various devices and report the status.



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

5.2. MAGNUM TALLY

Magnum tally is another way to get tally information, however this information is directed to Magnum server. To start add a third-party switcher device in magnum with the IP address of the 7700PTX-GVTALLY and port 9676, then commit the change. From the tally grid the new switcher can be selected and a new tally grid can be created.

6. TROUBLESHOOTING TIPS

6.1. 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-GVTALLY is receiving data from the switcher. If it is consistently reported as 0x00000000 then the 7700PTX-GVTALLY 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.

```

dbg_1_115 - HyperTerminal
File Edit View Call Transfer Help
incoming serial port statistics...
in  in  in
prot port subp
id  id  id  in chars  valid  cmds  cmds  timeout
          out  too lng malfrmd  discrds  no outQ  no
          *  *  *  *  *  *  *  *  *  *  *  *
11CT 1S1  0  0x00000000 0x00000000 0x000000 0x000000 0x000000 0x000000 0x000000 0x000000
11CT 2S2  0  0x00000000 0x00000000 0x000000 0x000000 0x000000 0x000000 0x000000 0x000000
11CT 3S3  0  0x00000000 0x00000000 0x000000 0x000000 0x000000 0x000000 0x000000 0x000000
11CT 4S4  0  0x00000000 0x00000000 0x000000 0x000000 0x000000 0x000000 0x000000 0x000000

outgoing serial port statistics...
Port  Out Cmds
****  *
S1    0x00000000
S2    0x00000000
S3    0x00000000

Connected 1:19:56  ANSI  115200 8-N-2  SCROLL  CAPS  NUM  Capture  Print echo
  
```

Figure 5-1: GVTALLY Status

6.2. 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-GVTALLY is able to communicate with that UMD peer. A status consistently reported as something other than *ready* indicates the inability of the 7700PTX-GVTALLY 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-GVTALLY is able to communicate with the UMD peer whose IP address is 192.168.18.40 and who is listening on TCP port 9800.

```

dbg_1_115 - HyperTerminal
File Edit View Call Transfer Help

UMD peer status...
Port      Dst Address      Tcp Port      Status
****      *****
E1        192.168.18.40   9800          ready
E1        0.0.0.0         0             no address set

router protocol task state: ready

router protocol PCB state...
1        down
2        ready
3        down
4        down

Connected 2:36:23  ANSI  115200 8-N-2  SCROLL  CAPS  NUM  Capture  Print echo
  
```

Figure 5-2: UMD Peer Status

7. PERFORMING A FIRMWARE UPGRADE

There are two ways to upgrade PTX firmware:

4. Using FTP to perform the upgrade via TCP/IP. (*recommended procedure*)
5. Using a terminal application such as *HyperTerminal* to perform the upgrade via a serial connection.

7.1. 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.

7.2. 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.