

# **TR-4800E**

## **Tally Router**

### **User Manual**

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**EVERTZ MICROSYSTEMS LTD.**

5292 John Lucas Drive  
Burlington, Ontario  
Canada L7L 5Z9

Phone: +1 905-335-3700  
Sales Fax: +1 905-335-3573  
Tech Support Phone: +1 905-335-7570  
Tech Support Fax: +1 905-335-7571

Internet: Sales: [sales@evertz.com](mailto:sales@evertz.com)  
Tech Support: [service@evertz.com](mailto:service@evertz.com)  
Web Page: <http://www.evertz.com>

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## IMPORTANT SAFETY INSTRUCTIONS

	The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “Dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (Servicing) instructions in the literature accompanying the product.

- Read and keep these instructions
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacturer’s instructions.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
- Only use attachments/accessories specified by the manufacturer
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



**WARNING:**

**TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE. DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT**



**WARNING:**

**THIS EQUIPMENT USES POWER/MAINS CONNECTORS FITTED WITH SAFETY GROUND PINS. TO REDUCE THE RISK OF ELECTRIC SHOCK, GROUNDING OF THE GROUND PIN OF THE MAINS PLUG MUST BE MAINTAINED. IN ADDITION GROUNDING OF GROUND TERMINAL ON THE MAIN EQUIPMENT CHASSIS MUST BE MAINTAINED.**



**WARNING:**  
**DANGEROUSLY HIGH VOLTAGES ARE PRESENT INSIDE THE POWER SUPPLY FRAME.**



**WARNING:**  
**TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE THIS EQUIPMENT MAY HAVE MORE THAN ONE POWER SUPPLY CORD. TO REDUCE THE RISK OF ELECTRIC SHOCK, DISCONNECT ALL POWER SUPPLY CORDS BEFORE SERVICING.**

**CAUTION:** These servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified personnel.

**CAUTION:** To reduce the risk of electric shock, plug each power supply cord into separate branch circuits employing separate service grounds.

NEVER use flammable or combustible chemicals for cleaning components.

NEVER operate this product with any covers removed.

NEVER wet the inside of this product with any liquid.

NEVER bypass any fuse or replace any fuse with a value or type other than those specified.

NEVER operate this product in an explosive atmosphere.

NEVER block the airflow through ventilation slots.

NEVER expose this product to extremely low or high temperatures.

This product complies with the requirements of the product family standards for video, audio, audio-visual entertainment, and lighting control apparatus for professional use as mentioned below.

# INFORMATION TO USERS IN EUROPE

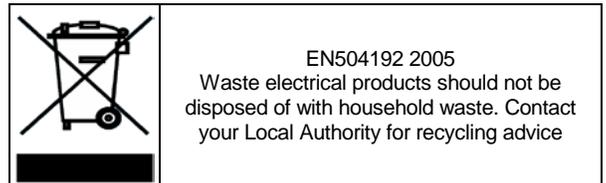
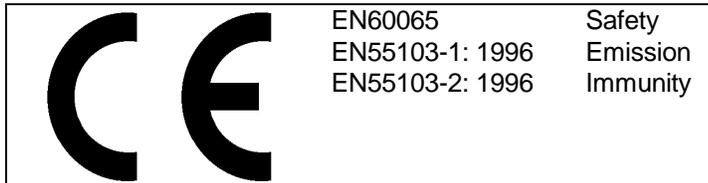
## NOTE

This equipment with the CE marking complies with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European standards:

- EN60065          Product Safety
- EN55103-1      Electromagnetic Interference Class A (Emission)
- EN55103-2      Electromagnetic Susceptibility (Immunity)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to the European Union EMC directive. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



# INFORMATION TO USERS IN THE U.S.A.

## NOTE

### FCC CLASS A DIGITAL DEVICE OR PERIPHERAL

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## WARNING

Changes or Modifications not expressly approved by Evertz Microsystems Ltd. could void the user's authority to operate the equipment.

Use of unshielded plugs or cables may cause radiation interference. Properly shielded interface cables with the shield connected to the chassis ground of the device is a must.

Evertz Microsystems Ltd



For Home or Office Use

Tested to comply  
with FCC  
Standards

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation.

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## REVISION HISTORY

<u>REVISION</u>	<u>DESCRIPTION</u>	<u>DATE</u>
1.0	First release	Apr 2015
1.1	Update for +BP16 option and TR4800-BHP option	Jul 2015
1.2	Update for firmware version 1.00 build 119 or newer	Nov 2015

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## 1 OVERVIEW

The TR-4800E Tally Router is an Ethernet-controlled interface for 32 General Purpose Inputs (GPIs) and 48 General Purpose Outputs (GPOs). It is the successor to the TR-3200E. All General Purpose I/O (GPIO) are provided on five, 37-pin D-Sub connectors on the back of the unit. A gigabit 1000baseT Ethernet connection is used to configure and control the unit. Two RS-232 serial ports are used for initial configuration and debug, and for optional serial control.

The unit is configured through SNMP using the *VistaLINK™* software. Advanced features such as edge triggering on inputs, and variable-length pulse outputs are easily setup with the graphical user interface. Each input or output can be set to normal logic (normally-open) or inverted logic (normally-closed). In addition, the state of the inputs and outputs can be monitored or changed manually for debugging purposes.

The Tally Router provides wet power on each of the rear 37-pin D-Sub connectors. This can be used to power passive devices (tally lights, buttons, buzzers, etc) to simplify wiring to GPIs and GPOs. The Wet power can be configured to come from either the 5V or 12V internal power sources, or from an external power source that is applied to the rear WET PWR binding posts.

The MAGNUM control system with the MAGNUM-TALLY software module integrates the GPI and GPO from the Tally Router into a single unified interface. The GPI and GPO of the Tally Router are represented graphically as a virtual tally pin grid. Each GPI and GPO signal is given a source and destination name. Custom triggers and behaviors can be easily setup to activate tally lights on cameras, trigger Under Monitor Displays (UMDs), activate switchers, replay and record systems, and more.

The TR-4800E is powered from a universal AC power supply that accepts 90V<sub>AC</sub> to 264V<sub>AC</sub>, at 50 or 60Hz. In addition to this, the unit is shipped with a universal external 12V DC power supply that connects to the 12V DC input on the back of the Tally Router. This provides a second, redundant power source to allow the Tally Router to perform in critical signal chains.



**Figure 1-1: Front Panel of the TR-4800E**



**Figure 1-2: Rear Panel of the TR-4800E**



Figure 1-3: Front Panel of the TR-4800E with 16 Binding Posts (+BP16 option)



Figure 1-4: Rear Panel View of the TR-4800E with the +BP16 option

The +BP16 ordering option adds 16 configurable GPIO to the front panel on binding posts. The rear wet power binding posts are moved to the front panel. Each of the 16 front panel GPIO are fully software-configurable to be either inputs or outputs, wet or dry. Each of the 16 GPIO have three LEDs to indicate their Input/Output, Wet/Dry, and On/Off status.



Figure 1-5: Optional TR4800-BHP Breakout Panel for Rear 48 GPO and 32 GPI

The optional TR4800BHP breakout panel can be ordered separately to break out the rear GPIO from the Tally Router. It comes with five, 6 foot long 37-pin D-Sub cables. Each of the 48 GPO and 32 GPI are available on 2-pin removable terminal blocks. Furthermore, each GPO and GPI is switchable between wet and dry mode. An LED indicator lights up when wet voltage is present. A cable strain relief bar is provided to tie cables and prevent accidental disconnection.

#### Features & Benefits:

- 48 General Purpose Outputs, and 32 General Purpose Inputs on rear 37-pin D-Sub connectors.
- Rear binding posts for external wet power input.
- Wet power source selectable between external power and internal 5V and 12V power sources.
- The +BP16 option adds 16 configurable GPI/GPO to the front panel on binding posts.
- General Purpose Inputs are protected by optoisolators. Wide voltage range up to 24V.
- General Purpose Outputs are protected by polyfuses.
- Can configure General Purpose Inputs for edge, high, or low triggering.
- Can configure General Purpose Outputs as pulse or steady outputs.
- All General Purpose I/O can be setup as normal (normally-open) or inverted (normally-closed).
- Available TR4800-BHP bulkhead panel to breakout rear GPIO.
- Gigabit Ethernet & Serial ports for SNMP configuration and Quartz Protocol control.
- Included external redundant universal DC power supply.

## 2 SPECIFICATIONS

### 2.1 REAR GENERAL PURPOSE INPUTS

<b>Number of GPIs:</b>	32
<b>Connectors:</b>	2 x D-Subminiature DC-37 female sockets, each with 16 GPI
<b>Maximum Voltage:</b>	+/- 24 Volts DC
<b>Protection:</b>	Current limit, approximately 10mA – 15mA.
<b>Wet Power:</b>	Provided on +WET and –WET pins (isolated from chassis ground)
<b>Timing:</b>	GPI trigger to “.UV” Quartz protocol Ethernet packet transmission: 2ms – 30ms

### 2.2 REAR GENERAL PURPOSE OUTPUTS

<b>Number of GPIs:</b>	48
<b>Connectors:</b>	3 x D-Subminiature DC-37 female sockets, each with 16 GPO
<b>Maximum Voltage:</b>	+/- 24 Volts DC
<b>Protection:</b>	Polyfuse, 0.15 Amps maximum
<b>Wet Power:</b>	Provided on +WET and –WET pins (isolated from chassis ground)
<b>Timing:</b>	GPO relay closure upon receipt of “.SA” Quartz protocol command: < 2ms

### 2.3 FRONT GENERAL PURPOSE I/O (+BP16 OPTION ONLY)

<b>Number of GPIOs:</b>	16
<b>Connectors:</b>	2 x Standard banana connector binding posts per GPIO (red/black)
<b>Maximum Voltage:</b>	+/- 24 Volts DC
<b>Protection:</b>	Polyfuse, 0.15 Amps maximum
<b>Wet Power:</b>	Switchable (12V/5V/External/None)

### 2.4 SERIAL PORTS

<b>Number:</b>	2
<b>Connector:</b>	Female DB-9
<b>Level:</b>	RS232 or RS422 software selectable
<b>Baud Rate:</b>	115200 baud
<b>Format:</b>	8 data bits, no parity, 2 stop bits
<b>Function:</b>	
<b>Serial 1 Port:</b>	Configuration: Command Line Interface
<b>Serial 2 Port:</b>	Control: Quartz Protocol

### 2.5 ETHERNET PORT

<b>Network Type:</b>	Gigabit Ethernet 1000Base-T IEEE 802.3z
<b>Connector:</b>	RJ-45
<b>SNMP Standard:</b>	SNMP v1 compliant (RFC-1157, RFC-1213)

## 2.6 POWER SUPPLIES

<b>AC Voltage:</b>	Auto-ranging 100 - 240 Volts AC, 50/60Hz
<b>Protection:</b>	Line fuse and neutral fuse (T2AL250V)
<b>Power Factor:</b>	> 0.7
<b>Redundant Supply:</b>	External +12V DC power supply provided (auto-ranging)
<b>Power Consumption</b>	
<b>Wet Power Off:</b>	20 watts typical (Wet power "none" or "external")
<b>Wet Power On:</b>	50 watts max (internal 5V or 12V power being used)

## 2.7 MECHANICAL AND ENVIRONMENTAL

<b>Dimensions:</b>	19" Width x 1.75" Height x 7.5" Depth (483mm Width x 45mm Height x 190mm Depth)
<b>Dimensions (+BP16):</b>	19" Width x 1.75" Height x 8.5" Depth (483mm Width x 45mm Height x 215mm Depth)
<b>Weight:</b>	4 lbs (1.8kg)
<b>Weight (+BP16):</b>	4.4 lbs (2.0kg)
<b>Operating Temperature:</b>	0°C to +40°C (32°F to 104°F) ambient

## 2.8 ORDERING OPTIONS

<b>+BP16</b>	Additional 16 GPIO on front panel binding posts
<b>TR4800-BHP</b>	Rear GPI/GPO breakout panel (ordered separately)

## 3 INSTALLATION

The Tally router is designed to fit into standard 19" equipment racks. Installation in a 19" rack is simple. Guide the unit through the aperture in the front of the rack until the rack-mounting flanges are flush against the side member of the rack and bolt in place with fixing screws (not supplied). Behind the unit a clearance of 8" (200mm) should be provided for the connection of external cables.

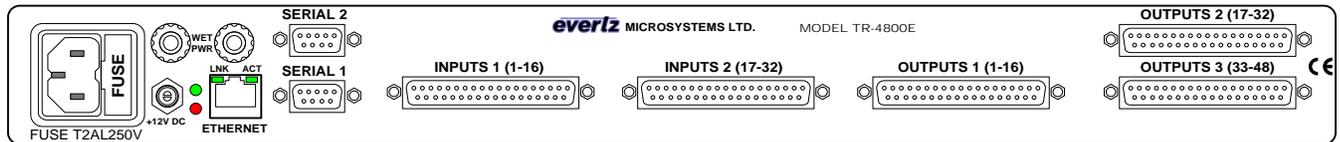


Figure 3-1: Rear Panel of TR-4800E

### 3.1 POWER CONNECTIONS

The TR-4800E power supply has an IEC320 C14 AC power inlet. This combines a standard power inlet with a fuse holder and EMI line filter. The inlet is fused from the factory for 120V with two fuses rated for 2 amps (T2AL250V). If the tally router is being used with 200V AC or higher, these fuses should be reduced to 1 amps (T1AL250V). The fuse holder can be removed once the power cord is unplugged by levering it out with a small screwdriver.

There is no power switch. The unit will power on as soon as the AC power is connected. The power supply is auto-ranging and can operate on 90-132 or 180-264 volts AC at 50Hz or 60Hz. Power should be applied by connecting a 3-wire grounding type power supply cord to the power entry modules on the rear panel. The power cord should be minimum 18 AWG wire size; type SVT marked VW-1, maximum 2.5 m in length.



**The AC inlet EMI line filter uses the chassis ground as part of the circuit. This generates a small amount of AC leakage current to ground. In order to reduce risk of electric shock, the unit MUST be grounded properly through the ground connections on the AC power supply inlets.**

A 12V DC barrel (2.5x5mm) connection on the rear of the frame can be used with the provided 12V DC external power supply. This provides the tally router with a redundant power supply and allows it to continue operating if a power fault occurs in one of the supplies. Ideally, the tally router AC inlet and the external 12V DC power supply should be powered by separate AC sources to provide true redundancy. When the 12V DC connection is plugged in, tighten the threaded locking collar securely to prevent accidental removal.

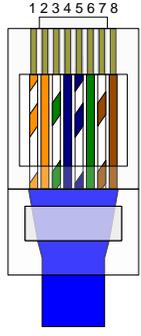


Figure 3-2: External AC Adapter Power Supply (12V DC)

### 3.2 ETHERNET CONNECTION

The TR-4800E is equipped with a Gigabit Ethernet port. It can be used with either 100base-TX (100 Mbps) or 1000base-T (1 Gbps) twisted pair Ethernet networks. Category 5e UTP cable or better is required with a maximum length of less than 100 meters (328 feet). The cable must be “straight through” with an 8-pin modular connector at each end. Make the network connection by plugging one end of the cable into the tally router and the other end into an Ethernet hub or switch.

The straight-through Ethernet cable can be purchased or can be constructed using the pinout information in Table 3 1. A color code wiring chart is provided in Table 3 1 for the current Ethernet standards (AT&T 258A or EIA/TIA 258B color coding shown). Also refer to the notes following the table for additional wiring guide information.

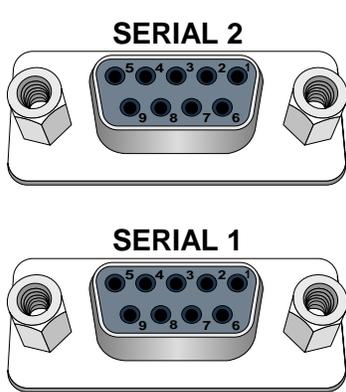
	Pin#	EIA/TIA 568A	AT&T 258A or EIA/TIA 568B	100Base-TX	1000Base-T
	1	White/Green stripe	White/Orange stripe	Transmit +	TxRx A+
	2	Green	Orange	Transmit –	TxRx A-
	3	White/Orange stripe	White/Green stripe	Receive +	TxRx B+
	4	Blue	Blue	Not Used (required)	TxRx C+
	5	White/Blue stripe	White/Blue stripe	Not Used (required)	TxRx C-
	6	Orange	Green	Receive –	TxRx B-
	7	White/Brown stripe	White/Brown stripe	Not Used (required)	TxRx D+
	8	Brown	Brown	Not Used (required)	TxRx D-

**Table 2-1: Standard 8-pin Modular Connector Wiring Color Codes**

The gigabit Ethernet port has two green LEDs marked “LNK” and “ACT”. The “LNK” LED will illuminate green when the connection speed is 1000base-T and will be off for 100base-T. The “ACT” LED will blink green with Ethernet activity. The Ethernet standard mandates auto-negotiation so crossover cables are no longer required. The initial TCP/IP settings of the unit can be set through the configuration serial port (Serial 1).

### 3.3 SERIAL PORTS

There are two serial ports available on the rear on the tally router as Female 9-pin D-Sub connectors. Both ports default to RS-232 mode but are also configurable as RS-422.



Pin #	RS-232 Mode	RS-422 Mode
1	Ground	Ground
2	Transmit Output (TxD)	Transmit A (Tx-)
3	Receive Input (RxD)	Receive B (Rx+)
4	Ground	Ground
5	Signal Gnd	Ground
6	Ground	Ground
7	Ready to Send (RTS)	Transmit B (Tx+)
8	Clear to Send (CTS)	Receive A (Rx-)
9	No Connection	No Connection

**Table 2-2: Serial Port Pin Definitions**

The Serial1 port is used for configuration, debug, and for upgrading the firmware on the unit. When the unit has finished booting, a “CLI>” prompt will be displayed. It is not recommended to play around with the command line interface unless under direction of Evertz customer support. The following commands may be used to configure, upgrade, or find information about the unit:

Command	Description
<b>ver</b>	Will display hardware and software version of the tally router
<b>ifconfig</b>	Used to configure the TCP/IP settings for the Ethernet port. Enter on one line: <b>ifconfig 0 inet [IP] netmask [SUBNETMASK] broadcast [BROADCAST] gateway [GATEWAY]</b>
<b>control</b>	Change the mode of the Serial2 port between RS-232 and RS-422. i.e. “ <b>control rs232</b> ” or “ <b>control rs422</b> ”
<b>reset</b>	Will reboot the unit (in order to perform a serial software upgrade)

**Table 2-3: Command Line Interface Commands**

The Serial2 port is used for optional Quartz protocol control. It can be switched between RS-232 mode and RS-422 mode using the “control” command described in Table 2-3. This setting is stored in NVRAM and remains persistent after a reboot or power loss. Please see section 5.1 for a discussion on how the Quartz protocol is used in the context of the tally router. Refer to Evertz application note AN65 for more information about the Quartz protocol.



**Both serial ports default to 115200 BAUD, 8 data bits, no parity, and 1 stop bit.**

### 3.4 REAR GENERAL PURPOSE INPUTS

There are 32 General Purpose Inputs (GPIs) available on two 37-pin D-Sub connectors on the rear on the tally router. These connectors are labelled “Inputs 1 (1-16)” and “Inputs 2 (17-32)”. The GPIs are “Wet” meaning they need external voltage to function. The GPI ports are used to read the tallies (GPOs) from products such as a vision mixer (production switcher). The pinout of these connectors is similar and is shown in Table 2-6 and Table 2-7.

Note that the GPI is polarity sensitive. The circuit diagram is shown in Figure 2-3 and the electrical specifications are in Table 2-4 and also in section 2.1. The GPI input is protected by a current source which limits the current into an optoisolator. The optoisolator is used to protect the tally router’s internal circuitry, and also to isolate the GPIs from each other. If more than +/- 24 volts is applied to a GPI it may become damaged but the damage will be isolated to the particular GPI.

The selected Wet Power source is available on five pins of the D-Sub connector as WET+ and WET-. The Wet Power negative (WET-) pins are isolated from chassis ground when the external wet power source is selected. The WET- pins are connected to chassis ground when the internal +5V or +12V wet power sources are selected. This Wet power can be used to wire the GPIs as “Dry”. Please see section 3.7 for more information on the wiring and the Wet/Dry terminology.

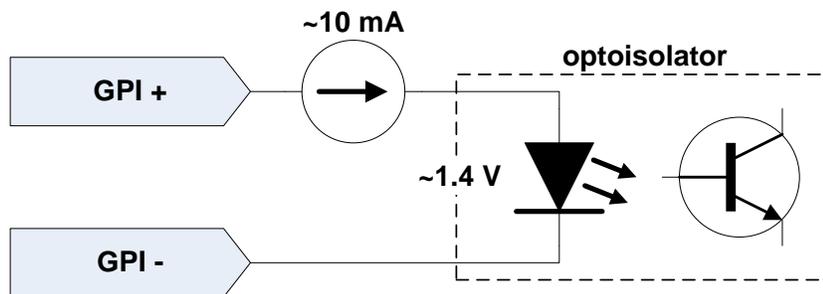


Figure 3-3: Rear GPI Input Schematic

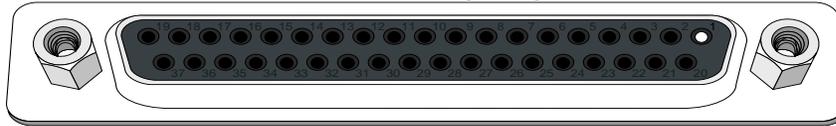
Maximum GPI Voltage	+24 Volts DC
Maximum Reverse GPI Voltage	-24 Volts DC
Voltage to Turn GPI On	> +2.0 Volts
Voltage to Turn GPI Off	< +1.0 Volts
GPI Current Limiting	~10mA @ +5V
	~12mA @ +12V
	~15mA @ +24V

Table 2-4: Rear GPI Input Electrical Specifications



**Do not apply a voltage higher or lower than the maximums or the GPI may be permanently damaged.**

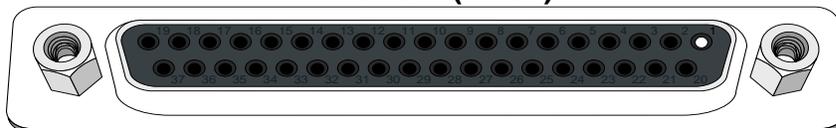
## INPUTS 1 (1-16)



Wet Voltage Return <b>WET-</b>	1	20	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	2	21	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	3	22	Wet Input 1 (-)
Wet Input 1 (+)	4	23	Wet Input 2 (-)
Wet Input 2 (+)	5	24	Wet Input 3 (-)
Wet Input 3 (+)	6	25	Wet Input 4 (-)
Wet Input 4 (+)	7	26	Wet Input 5 (-)
Wet Input 5 (+)	8	27	Wet Input 6 (-)
Wet Input 6 (+)	9	28	Wet Input 7 (-)
Wet Input 7 (+)	10	29	Wet Input 8 (-)
Wet Input 8 (+)	11	30	Wet Input 9 (-)
Wet Input 9 (+)	12	31	Wet Input 10 (-)
Wet Input 10 (+)	13	32	Wet Input 11 (-)
Wet Input 11 (+)	14	33	Wet Input 12 (-)
Wet Input 12 (+)	15	34	Wet Input 13 (-)
Wet Input 13 (+)	16	35	Wet Input 14 (-)
Wet Input 14 (+)	17	36	Wet Input 15 (-)
Wet Input 15 (+)	18	37	Wet Input 16 (-)
Wet Input 16 (+)	19		

Table 2-5: Rear Panel Inputs 1 (1-16) Connector Pinout

## INPUTS 2 (17-32)



Wet Voltage Return <b>WET-</b>	1	20	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	2	21	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	3	22	Wet Input 17 (-)
Wet Input 17 (+)	4	23	Wet Input 18 (-)
Wet Input 18 (+)	5	24	Wet Input 19 (-)
Wet Input 19 (+)	6	25	Wet Input 20 (-)
Wet Input 20 (+)	7	26	Wet Input 21 (-)
Wet Input 21 (+)	8	27	Wet Input 22 (-)
Wet Input 22 (+)	9	28	Wet Input 23 (-)
Wet Input 23 (+)	10	29	Wet Input 24 (-)
Wet Input 24 (+)	11	30	Wet Input 25 (-)
Wet Input 25 (+)	12	31	Wet Input 26 (-)
Wet Input 26 (+)	13	32	Wet Input 27 (-)
Wet Input 27 (+)	14	33	Wet Input 28 (-)
Wet Input 28 (+)	15	34	Wet Input 29 (-)
Wet Input 29 (+)	16	35	Wet Input 30 (-)
Wet Input 30 (+)	17	36	Wet Input 31 (-)
Wet Input 31 (+)	18	37	Wet Input 32 (-)
Wet Input 32 (+)	19		

Table 2-6: Rear Panel Inputs 2 (17-32) Connector Pinout

### 3.5 REAR GENERAL PURPOSE OUTPUTS

There are 48 General Purpose Outputs (GPOs) available on three 37-pin D-Sub connectors on the rear on the tally router. These connectors are labelled “Outputs 1 (1-16)”, “Outputs 2 (17-32)” and “Outputs 3 (33-48)”. The rear GPOs are “Dry”. The GPOs can be used to activate tally lights or send triggers to equipment such as the Evertz VIP multiviewers, switchers, and keyers. They can also be used to drive camera tally lamps. The pinout of these connectors are not all the same and care must be taken to use the correct wiring (see Table 2-8, Table 2-9, and Table 2-10).

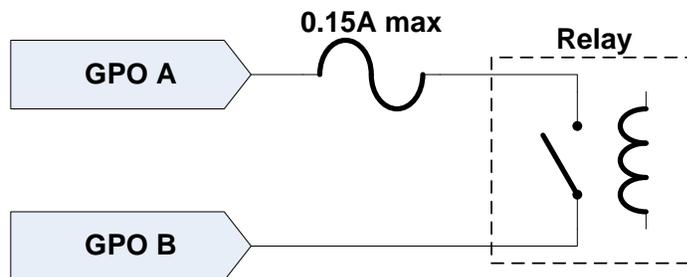


**The Outputs 1 connector uses a different pinout than Outputs 2 or Output 3.**

The General Purpose Outputs are not polarity sensitive. Each GPO has two pins marked “A” and “B”. The GPO consists of an isolated relay contact pair. When the GPO is closed, the two contact “A” and “B” will be electrically connected to each other. See Figure 2-4 for the circuit diagram of a GPO. The GPO specifications are listed in section 2.2.

Each GPO is protected against excessive current with a polyfuse. Polyfuses operate by means of thermal limiting. The maximum allowable current is shown in Table 2-7. If excessive current is applied to the GPO the polyfuse will heat up and open. This process happens very quickly if the current is high but may take hours if the current is only a little above the maximum. When the polyfuse opens, it immediately begins to cool and will eventually reset on its own. If the fault is not removed, the process will repeat itself any may cause a “strobing” effect on any load devices connected to the GPO.

The currently selected Wet Power source is available on five pins of the D-Sub connector. The **WET-** pin is isolated from chassis ground when using an external wet power source. It is connected to chassis ground when using the internal +5V or +12V wet power sources. The **WET+** voltage can be used to wire the GPOs as “Wet”. Please see section 2.7 for more information.



**Figure 3-4: Rear General Purpose Output Circuit Diagram (Dry)**

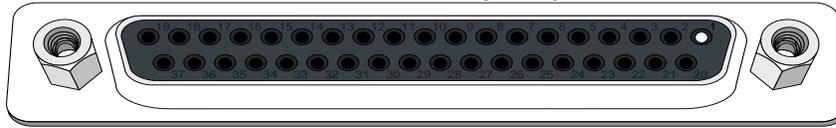
Maximum Current	0.15 Amps
Maximum Voltage	+/- 24V DC
Closed Contact Resistance	< 3.0 Ω

**Table 2-7: Rear General Purpose Output Electrical Specifications**



**Do not exceed the maximum voltage specified or the GPO may be damaged.**

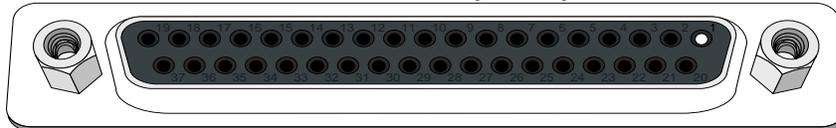
## OUTPUTS 1 (1-16)



Wet Voltage Return <b>WET-</b>	1	20	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	2	21	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	3	22	Dry Output 1 (B)
Dry Output 1 (A)	4	23	Dry Output 2 (B)
Dry Output 2 (A)	5	24	Dry Output 3 (B)
Dry Output 3 (A)	6	25	Dry Output 4 (B)
Dry Output 4 (A)	7	26	Dry Output 5 (B)
Dry Output 5 (A)	8	27	Dry Output 6 (B)
Dry Output 6 (A)	9	28	Dry Output 7 (B)
Dry Output 7 (A)	10	29	Dry Output 8 (B)
Dry Output 8 (A)	11	30	Dry Output 9 (B)
Dry Output 9 (A)	12	31	Dry Output 10 (B)
Dry Output 10 (A)	13	32	Dry Output 11 (B)
Dry Output 11 (A)	14	33	Dry Output 12 (B)
Dry Output 12 (A)	15	34	Dry Output 13 (B)
Dry Output 13 (A)	16	35	Dry Output 14 (B)
Dry Output 14 (A)	17	36	Dry Output 15 (B)
Dry Output 15 (A)	18	37	Dry Output 16 (B)
Dry Output 16 (A)	19		

Table 2-8: Rear Panel Outputs 1 (1-16) Connector Pinout

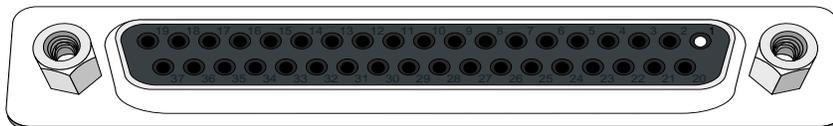
## OUTPUTS 2 (17-32)



Dry Output 32 (A)	1	20	Dry Output 32 (B)
Dry Output 31 (A)	2	21	Dry Output 31 (B)
Dry Output 30 (A)	3	22	Dry Output 30 (B)
Dry Output 29 (A)	4	23	Dry Output 29 (B)
Dry Output 28 (A)	5	24	Dry Output 28 (B)
Dry Output 27 (A)	6	25	Dry Output 27 (B)
Dry Output 26 (A)	7	26	Dry Output 26 (B)
Dry Output 25 (A)	8	27	Dry Output 25 (B)
Dry Output 24 (A)	9	28	Dry Output 24 (B)
Dry Output 23 (A)	10	29	Dry Output 23 (B)
Dry Output 22 (A)	11	30	Dry Output 22 (B)
Dry Output 21 (A)	12	31	Dry Output 21 (B)
Dry Output 20 (A)	13	32	Dry Output 20 (B)
Dry Output 19 (A)	14	33	Dry Output 19 (B)
Dry Output 18 (A)	15	34	Dry Output 18 (B)
Dry Output 17 (A)	16	35	Dry Output 17 (B)
Wet Voltage Return <b>WET-</b>	17	36	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	18	37	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	19		

Table 2-9: Rear Panel Output 2 (17-32) Connector Pinout

## OUTPUTS 3 (33-48)



Dry Output 48 (A)	1	20	Dry Output 48 (B)
Dry Output 47 (A)	2	21	Dry Output 47 (B)
Dry Output 46 (A)	3	22	Dry Output 46 (B)
Dry Output 45 (A)	4	23	Dry Output 45 (B)
Dry Output 44 (A)	5	24	Dry Output 44 (B)
Dry Output 43 (A)	6	25	Dry Output 43 (B)
Dry Output 42 (A)	7	26	Dry Output 42 (B)
Dry Output 41 (A)	8	27	Dry Output 41 (B)
Dry Output 40 (A)	9	28	Dry Output 40 (B)
Dry Output 39 (A)	10	29	Dry Output 39 (B)
Dry Output 38 (A)	11	30	Dry Output 38 (B)
Dry Output 37 (A)	12	31	Dry Output 37 (B)
Dry Output 36 (A)	13	32	Dry Output 36 (B)
Dry Output 35 (A)	14	33	Dry Output 35 (B)
Dry Output 34 (A)	15	34	Dry Output 34 (B)
Dry Output 33 (A)	16	35	Dry Output 33 (B)
Wet Voltage Return <b>WET-</b>	17	36	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	18	37	<b>WET+</b> Voltage (5V/12V/EXT)
Wet Voltage Return <b>WET-</b>	19		

**Table 2-10: Rear Panel Outputs 3 (33-48) Connector Pinout**

### 3.6 WET POWER

The TR-4800E has a dedicated wet power source that can be used to provide voltage to GPIs and GPOs. This allows the GPIO to be either powered or unpowered depending on the requirements of the equipment that needs to be interfaced to (see section 2.7). This wet power source is provided to all of the rear 37-pin D-Sub connectors as **+WET** and **-WET**. It is also used to power the front panel binding post GPIOs (+BP16 option only).

The tally router's wet power is software-selectable between several sources, and can also be turned off completely. The front panel has three green LEDs that indicate the currently selected wet power source. There is also a red "On" LED that indicates if power is present on the selected source. This LED will be illuminated when power is present, and off when power is not present or a current fault has occurred (polyfuse tripped).

Wet Power Source	Description
None	Wet power <b>+WET</b> and <b>-WET</b> will be disconnected (no voltage). All of the front panel LEDs will be off.
+5V	The internal +5V power will be connected to <b>+WET</b> and <b>-WET</b> will be connected to chassis ground. The front panel will have the "+5V" LED illuminated.
+12V	The internal +12V power will be connected to <b>+WET</b> and <b>-WET</b> will be connected to chassis ground. The front panel will have the "+12V" LED illuminated.
External	The WET PWR binding posts on the rear of the unit (front panel for +BP16 option) will be used as the source for wet power. The red binding post will be connected to <b>+WET</b> and the black binding post will be connected to <b>-WET</b> (isolated from chassis ground). The front panel will have the "EXT" LED illuminated.

**Table 2-11: Wet Power Source Selections**

The wet power source **+WET** is protected by a 1.5 Amp polyfuse, no matter which source is selected. This means that if an external wet voltage source is selected that is capable of supplying more than 1.5 Amps, the current through the tally router will still be limited to 1.5 Amps. Care must be taken to limit the cumulative **+WET** current draw of all powered GPIO to 1.5 Amps or less.

If more current than the maximum is applied to the GPO the polyfuse will heat up and open. This process happens very quickly if the current is high, but may take hours if the current is only a little above the maximum. When the polyfuse opens, the front panel "On" LED will turn off. The polyfuse will then begin to cool and will eventually reset on its own. If the overcurrent fault is not removed, the process will repeat itself any may cause a "strobing" effect with the "On" LED.

### 3.7 GENERAL PURPOSE I/O MODES

The TR-4800E tally router is designed to have flexible General Purpose I/O to allow them to be used for a wide range of purposes from driving all types of equipment to illuminating lamps, and reading the state of switches. The GPIs and GPOs can be wired in Wet or Dry mode to interface with both powered and unpowered devices. The GPIs have a wide voltage range and high sensitivity (see Table 2-4). The GPO relay contacts can support a relatively high amount of current (see Table 2-7).

#### 3.7.1 Tally Wet and Dry Terminology

The Tally Router is named after the most common use which is driving tally lights on cameras. In a live recording studio with multiple cameras, each camera has a tally light which indicates it is the one that is currently being broadcast. The director sends commands to switch between the cameras. The main video router switches the video feed between the cameras, and the tally router follows by switching the corresponding tally light GPOs.

Throughout this manual the “wet” and “dry” terminology is used to describe whether a GPO and GPI provides/requires an external voltage source to operate. This terminology is arcane and confusing outside its narrow scope of usage. The term “Wet” means that voltage is present and “Dry” means no voltage, **always from the perspective of the output port** (General Purpose Output).



When connecting a GPO to a GPI, remember “**Wet**” to “**Wet**” and “**Dry**” to “**Dry**”.  
Never connect “**Wet**” to “**Dry**” or vice-versa.

A General Purpose Output has two contacts marked “A” and “B”. A “Dry” GPO opens these two contacts when OFF, and closes them when turned ON. No voltage is present. A “Wet” GPO provides **+WET** voltage when it is activated in order to provide power to a downstream device such as a light bulb, buzzer, or Wet GPI. See sections 2.8.1 and 2.9.1 for more information.



A “**Wet**” GPO **provides** voltage to the downstream device.  
A “**Dry**” GPO **does not provide** voltage to the downstream device.

The General Purpose Inputs are used to read the state of another device. This may be a passive device such as a pushbutton or switch, but is often connected to a GPO. A “Wet” GPI is named such that it is wired to connect to a “Wet” GPO. This means a “Wet” GPI does not provide its own voltage source. A “Dry” GPI is meant to interface to a “Dry” GPO. This means that it provides a **+WET** voltage which the external device must return in order to activate the GPI. See sections 2.8.2 and 2.9.2 for more information.



A “**Wet**” GPI **requires** an external voltage to be applied in order to activate it.  
A “**Dry**” GPI **requires** only an external contact closure to return its own voltage to activate it

### 3.7.2 General Purpose Output Modes

The default state of GPOs is “normally-open” mode with pulse mode disabled. When the GPO is off, the “A” and “B” contacts are open (normally-open). When the GPO is turned on, the contacts close.

If pulse mode is enabled, the GPO behaves in a one-shot fashion. When the GPO is off, the contacts are open (normally-open). When the GPO is turned on, the contacts pulse closed for a period of time, then open again. Pulse mode can be individually enabled for any GPO (see section 3.3) and the pulse width can be changed between 50 milliseconds, 100 milliseconds, 200 milliseconds, or 300 milliseconds.



Changing the pulse width affects all pulse-enabled GPOs within the bank. There are four banks. Outputs 1-16, outputs 17-32, outputs 33-48 are the three rear GPO banks. Outputs 49-64 are the optional front binding posts GPIO bank (+BP16 only).

Each General Purpose Output can have its logic inverted. This is called “normally-closed” mode. When placed into “normally-closed” mode, a GPO will have its contacts closed when it is off. When the GPO is turned on, its contacts will open. Note that the “normally-closed” mode does not affect pulse mode. If pulse mode is enabled, the GPO will always be normally open and pulse closed.



When the unit boots up, all GPOs will default to Off (either normally-open or normally-closed). The GPO state is not retained on power loss, but the configuration is.

### 3.7.3 General Purpose Input Modes

The default state of GPIs is “normally-open” mode with edge triggering disabled. When a GPI is not activated it reports that it is Off. While a GPI is activated by an external voltage source, it reports that it is On. The GPI reports the level that is applied to its inputs.

Each GPI can be individually set to have edge triggering enabled. When in edge triggering mode, the GPI turns on and off only when it transitions from an inactive to an active state (rising edge). On a rising transition it will turn on, and on the next rising transition it will turn off. The trigger edge can be changed to the falling edge as well (see section 3.3).



The edge triggering feature is only available on firmware version 1.00 build 121 or newer.

Each GPI can have its logic inverted. This is called “normally-closed” mode. When placed into “normally-closed” mode, the GPI behaviour is identical except that it reports the opposite On/Off state as when in the default “normally-open” mode.

### 3.8 FRONT PANEL BINDING POSTS OPTION (+BP16)

If the TR-4800E is ordered with the +BP16 option, there will be an additional 16 General Purpose I/O (GPIO) channels available on the front panel on standard banana plug binding post connectors. These are called GPIO as they are software-selectable between input (GPI) and output (GPO) modes. The Wet Power binding posts are moved from the rear of the unit to the front panel.



Figure 3-5: Front Panel with +BP16 Option

#### 3.8.1 Binding Post Outputs

When a GPIO channel has been configured as a GPO, the respective “OUT” LED will illuminate. The GPO can be switched between Wet and Dry modes (see section 2.7.1). When the GPO is in Wet mode the “WET” LED will illuminate. In Wet mode the black binding post will be connected to WET-. The red binding post will be open when the GPO is off, and connected to WET+ when the GPO is turned on. When the GPO is in Dry mode the “WET” LED will turn off and there will be a simple relay contact closure between the red and black binding posts. The “ON” LED will illuminate Red whenever the GPO is in the on state.

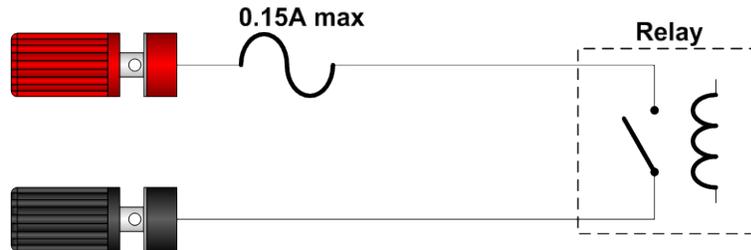


Figure 3-6: Front GPIO Channel in Dry GPO Mode Circuit Diagram

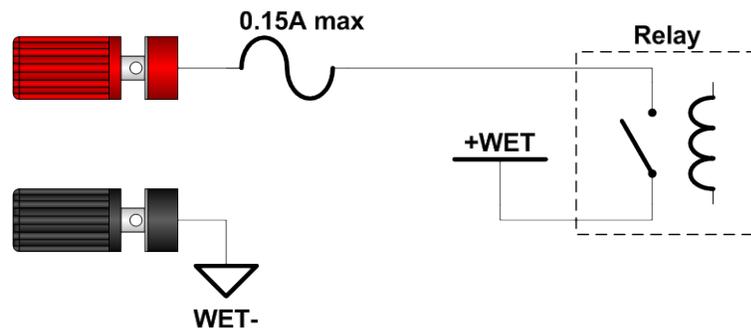


Figure 3-7: Front GPIO Channel in Wet GPO Mode Circuit Diagram

Maximum Current	0.15 Amps
Maximum Voltage	+/- 24V DC
Closed Contact Resistance	< 3.0 Ω

Table 2-12: Front GPIO Channel in GPO Mode Electrical Specifications



Do not exceed the maximum voltage specified or the GPO may be damaged.

### 3.8.2 Binding Post Inputs

When a GPIO channel has been configured as a GPI, the respective “OUT” LED will turn off. The GPI can be switched between Wet and Dry modes (see section 2.7.1). When the GPI is in Wet mode the “WET” LED will illuminate. In Wet mode the GPI can be turned on by applying voltage in either direction. It is not polarity sensitive like the rear GPIs. When the GPI is in Dry mode the red binding post will have +WET voltage on it. It can be activated by connecting the red binding post to the black. The “ON” LED will illuminate any time the GPI is activated.

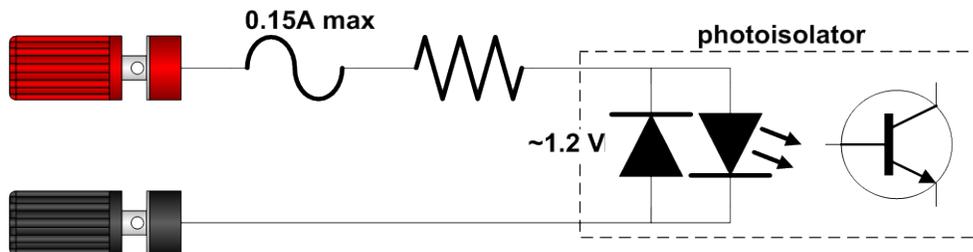


Figure 3-8: Front panel GPIO in Wet GPI Mode Circuit Diagram

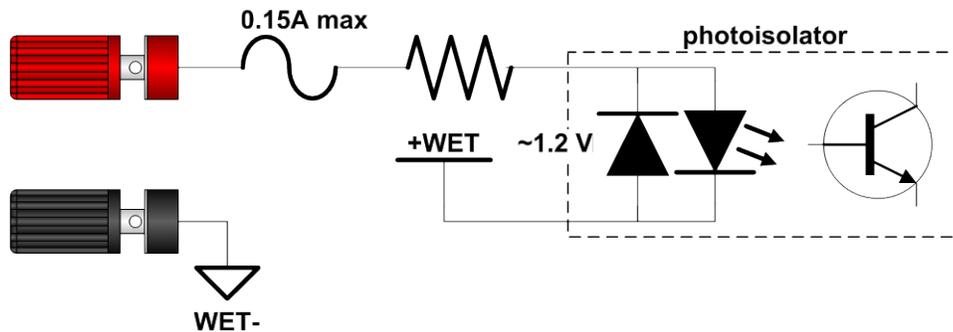


Figure 3-9: Front GPIO Channel in Dry GPI Mode Circuit Diagram

Maximum GPI Voltage	+24 Volts DC
Maximum Reverse GPI Voltage	-24 Volts DC
Voltage to Turn GPI On	> +2.0 Volts
Voltage to Turn GPI Off	< +1.0 Volts
GPI Current	~3mA @ +5V
	~9mA @ +12V
	~20mA @ +24V

Table 2-13: Front GPIO Channel in GPI Mode Electrical Specifications

### 3.9 OPTIONAL TR4800-BHP BULKHEAD PANEL

The TR4800-BHP is an separate ordering item that is used to break out the 48 General Purpose Outputs and 32 General Purpose Inputs from the five 37-pin D-Sub connectors on the rear of the tally router. It is shipped with five 6-foot (2 meter) cables to allow remote placement of the bulkhead panel. There is an LED to indicate if Wet Power is currently present. Each GPO and GPI can be switched between Wet and Dry modes by means of slide switches. All GPIO are broken out to 2-pin removable terminal blocks to allow easy wiring and re-wiring of the panel. A cable strain relief bar runs across the middle of the panel to provide a tie point for cables to prevent accidental removal.

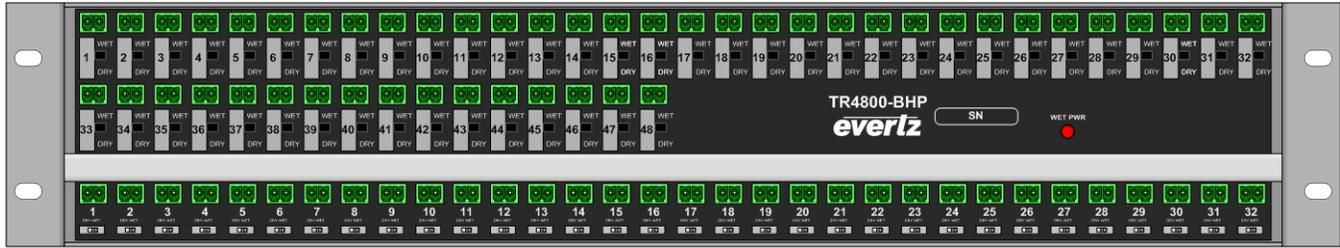


Figure 3-10: Optional TR4800-BHP Bulkhead Panel



**When connecting the rear D-Sub cables, be careful to connect the correct port on the rear of the Tally Router to the same port on the rear of the TR4800-BHP.**

#### 3.9.1 TR4800-BHP General Purpose Output Connections

The rear 48 General Purpose Outputs from the tally router are broken out to 48 terminal blocks across the top of the bulkhead panel. Each GPO has a slide switch below it to select between Wet and Dry modes (see section 2.7.1). The circuit diagrams for the GPOs in both modes are shown in Figure 2-11 and Figure 2-12.

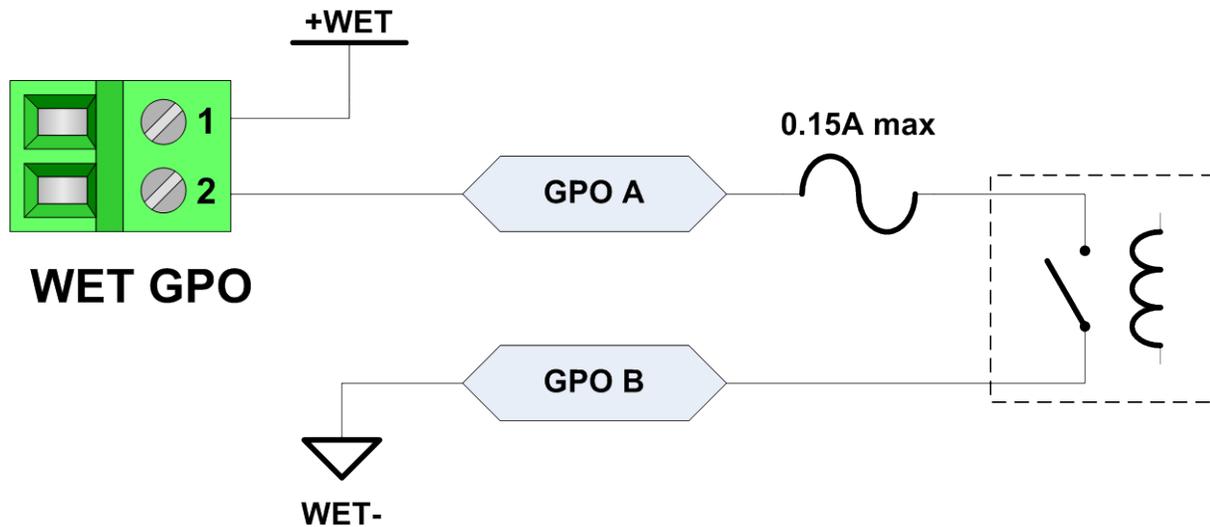


Figure 3-11: TR4800-BHP GPO in Wet Mode Circuit Diagram

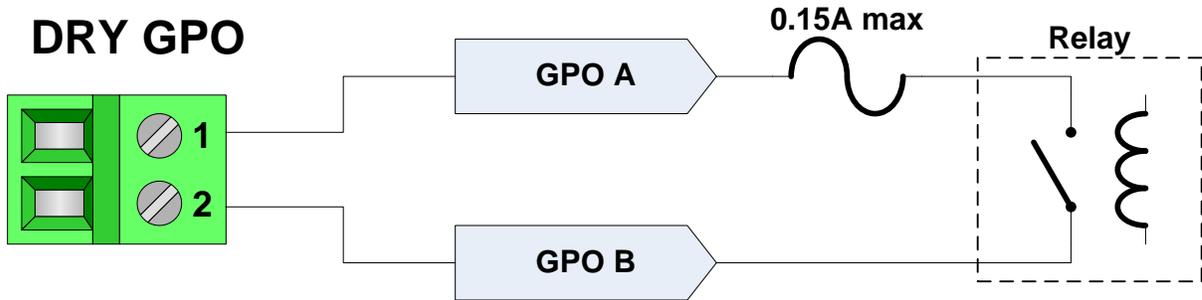


Figure 3-12: TR4800-BHP GPO in Dry Mode Circuit Diagram

### 3.9.2 TR4800-BHP General Purpose Input Connections

The rear 32 General Purpose Inputs from the tally router are broken out to 32 terminal blocks across the bottom of the bulkhead panel. Each GPO has a miniature slide switch below it to select between Wet and Dry modes (see section 2.7.1). The circuit diagrams for the GPIs in both modes are shown in Figure 2-13 and Figure 2-14.

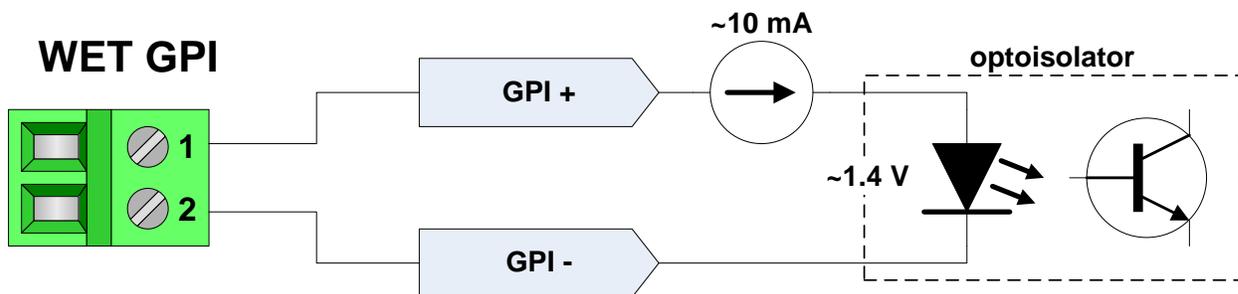


Figure 3-13: TR4800-BHP GPI in Wet Mode Circuit Diagram

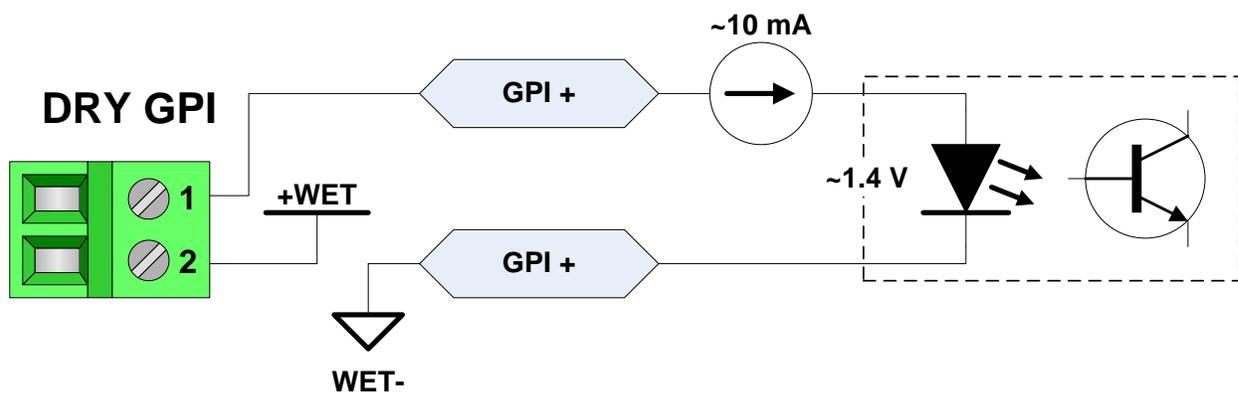


Figure 3-14: TR4800-BHP GPI in Dry Mode Circuit Diagram

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## 4 CONFIGURATION

The TR-4800E Tally Router is primarily configured and controlled through the Ethernet port using the SNMP and Quartz protocols. The serial ports (see section 2.3) are used for initial configuration and for optional serial-based Quartz protocol control.

### 4.1 SETTING THE IP ADDRESS

Usually the first configuration step is to assign an IP address to the tally router. This can be done using the command line interface on the Serial1 port.

1. Connect the serial port to a PC or laptop computer.
2. Open the serial port using a terminal program such as HyperTerminal.
3. Configure the port for 115200 BAUD, 8 data bits, no parity, and 1 stop bit.
4. Apply power to the TR-4800E and wait 20 seconds for it to boot up.
5. Press ENTER in the terminal and the “CLI>” command line interface prompt should appear.

The IP address of the unit can be set with the “ifconfig” command. The general format of the command is shown as follows:

```
ifconfig 0 inet [IP] netmask [SUBNETMASK] broadcast [BROADCAST] gateway [GATEWAY]
```

Assign an unused IP address that is compatible with your network’s addressing scheme. Below is an example of a typical command:

```
ifconfig 0 inet 172.21.1.75 netmask 255.255.255.0 broadcast 172.21.1.255 gateway 172.21.1.1
```

Once the command has been entered, the tally router will start using the IP address immediately. Perform a “ping” test to see if the connection is working.

## 4.2 UPDATING AND USING VISTALINK PRO

The TR-4800E supports the Simple Network Management Protocol (SNMP) for remote monitoring and control through an IP network. The tally router implements SNMP version 1 as outlined in RFC 1157 and RFC 1213. The protocol works by exchanging UDP messages between an SNMP client (normally a computer running an SNMP client program) and a device such as the tally router.

There are three main types of SNMP messages. An SNMP Get Request is sent from a client to a device and is used to read a value from the device. An SNMP Set Request is sent from a client to a device and is used to change a value on the device. An SNMP Trap is sent from a device to a logging client whenever a certain event takes place. Traps are usually sent in order to notify the client that an error or other event has occurred on the device that requires attention.

Evertz offers VistaLINK® Pro, a powerful software suite for SNMP monitoring and control suitable for management of both small and large systems. The VistaLINK® Pro client is a powerful SNMP client that is offered as a free download from the Evertz website ([www.evertz.com](http://www.evertz.com)). It can be used for monitoring and configuring Evertz gear. The full version of VistaLINK® provides a server application for centralized alarm management, which monitors, reports, and logs all incoming trap events and dispatches alerts to all the VistaLINK® clients connected to the server. Advanced scripting, customizable graphical user interfaces, and more can be created for advanced automation and control purposes.

Device configuration through the VistaLINK® Pro client can be performed on an individual or multi-unit basis. The configuration of devices can be managed using simple copy and paste functions, which reduces the time required to configure each unit separately. VistaLINK® allows the user to configure all devices on the network from a central station using simple visual controls and receive feedback that the configuration has been successfully carried out.

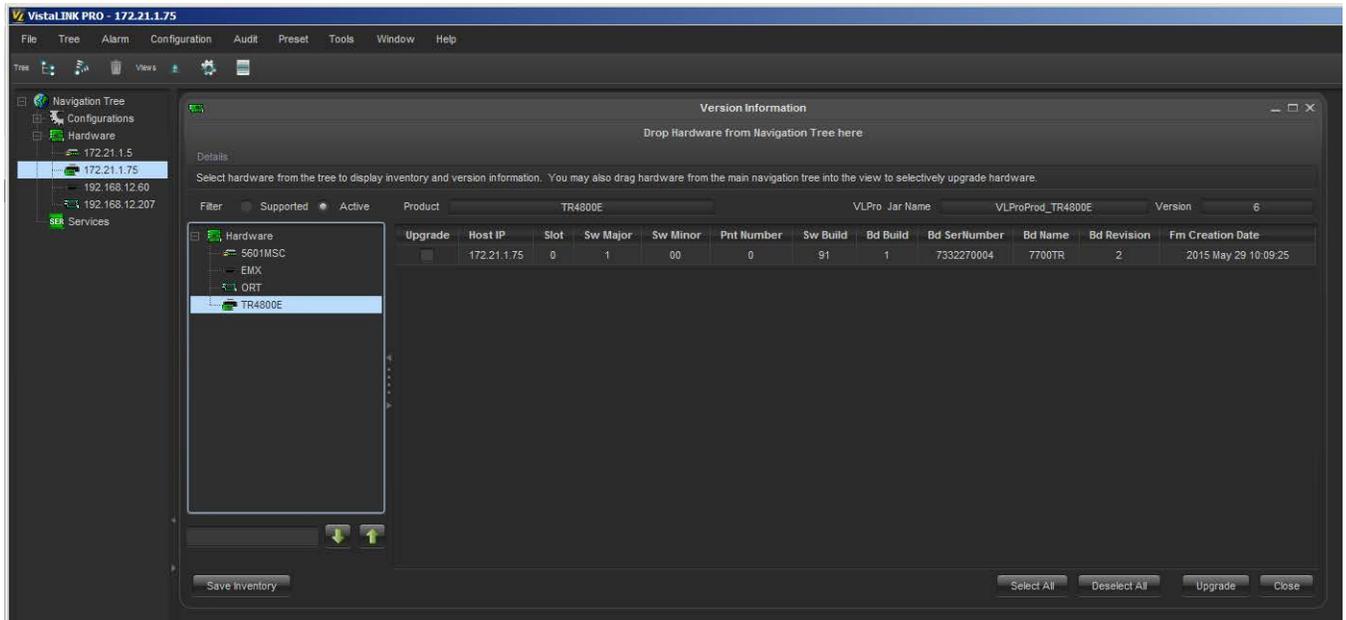
### 4.2.1 Updating VistaLINK® with a New JAR File

The VistaLINK® Pro client provides an interactive and visual interface to configure and monitor the tally router. This interface is stored in a *JAR* file. The *JAR* file for the TR-4800E is named “VLProProd\_TR4800E.jar”. In order to recognize and display the graphical configuration for the tally router, VistaLINK® Pro must first be updated with this *JAR* file. Future versions of VistaLINK® Pro will have the TR-4800E *JAR* built-in, however newer versions of the *JAR* will occasionally be released by Evertz, usually in conjunction with new versions of firmware.

To see which version of the *JAR* is being used, open the VistaLINK® Pro client and select the “Tools” menu, go to “Products” and select the “Version Information...” menu item.



It is critical that the *JAR* version used is matched to the firmware version of the unit, otherwise some controls may not operate properly. All *JAR* updates are available on the Evertz website ([www.evertz.com](http://www.evertz.com)). The TR-4800E is listed under the “Routers” section.



**Figure 4-1: VistaLINK® Pro Version Information**

In the Version Information dialog window, all of the *JAR* files that are contained within the VistaLINK® Pro client are listed on the left. Scroll down the list to the TR4800E. Once selected, the product version is displayed. In the example above, the TR4800E *JAR* file version 6 is being used. If the TR4800E does not appear in the list, then VistaLINK® will have to be updated.



The firmware version on the unit is shown in the Version Information dialog window. The “Sw Build” number shows that the unit is running build 91 which is old firmware.

### 4.2.2 Applying a JAR update VistaLINK® Pro

To update the VistaLINK® Pro software with a new JAR file, activate the “Help” menu then select the “Apply Update” menu item. In the next pop-up menu, choose the “Product...” menu item. Browse to the folder containing the JAR update and select the “VLProProd\_TR4800E.jar” file.

Once the file JAR file has been opened, a message will appear stating that the VistaLINK® Pro software must be restarted before the update can be applied. The restart can be performed at any convenient time by closing and re-opening the application. Note that when the server is restarted it will force any clients that are currently connected to terminate.

### 4.2.3 Opening the Configuration View for the TR-4800E in VistaLINK® Pro

When the VistaLINK® Pro software has been updated with the latest JAR, the client should automatically detect any TR-4800E units connected to the network during the next discovery. Open the “Tree” menu and select “Refresh” to perform a network discovery immediately. Discovered devices are displayed on the left side of the screen in the Navigation Tree under the Hardware node. If the navigation tree is not visible, check that it has not been hidden by opening the “Tree” menu and selecting “Hide/Show Tree”. If the hardware node is not visible, check that it is enabled in the “Tree” menu under “Properties”. The TR-4800E should show up as a 1RU network graphic, listed by its IP address: . The network tree entry for the TR-4800E can be renamed to any helpful description by choosing the “Update Description” menu item.

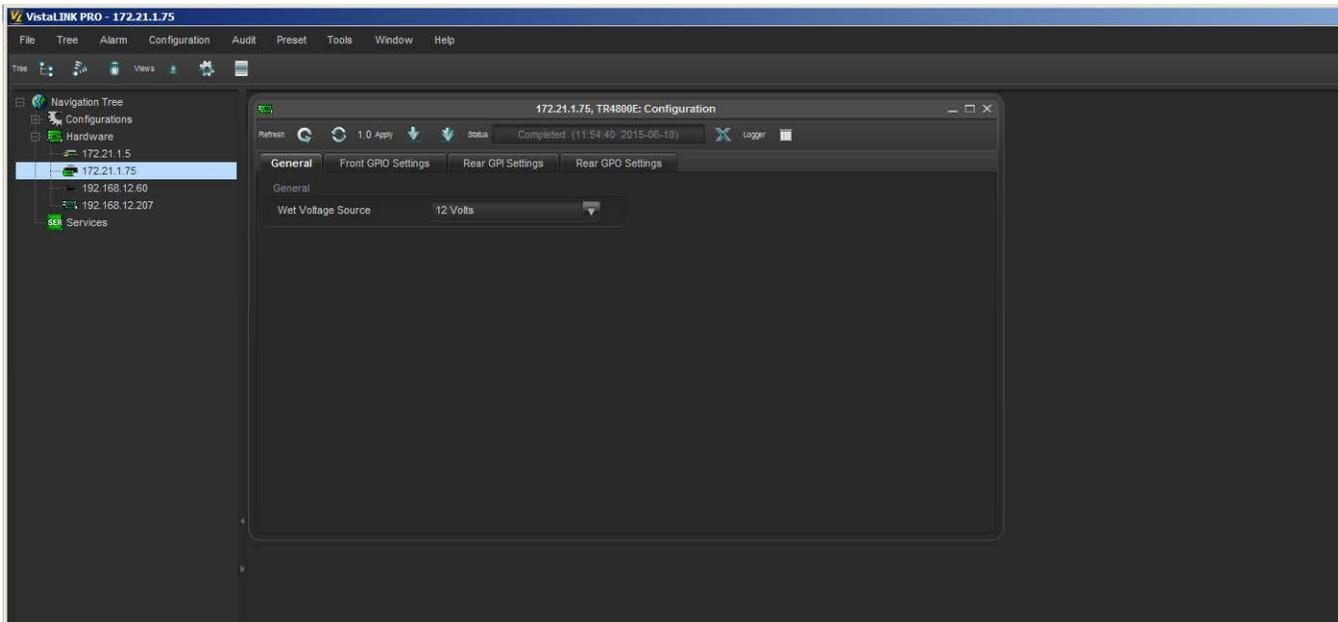


Figure 4-2: VistaLINK® Pro Configuration View

The configuration view is used to graphically configure and monitor the TR-4800E. It can be accessed by right-clicking on the device in the navigation tree and selecting “View Configuration”. The configuration view will appear and automatically load all settings from the tally router. The refresh operation may take a few seconds, depending on network traffic conditions.

#### 4.2.4 Opening the Alarm View for the TR-4800E in VistaLINK<sup>®</sup> Pro

The Alarm view can be accessed by right-clicking on the TR-4800E in the Navigation Tree and selecting “View Alarm”. This will open up an alarm window that pulls the alarm log from the VistaLINK<sup>®</sup> Pro server. The server is responsible for logging all traps it receives from the tally router and provides this information to the clients. The Alarm view is not available in the client-only version of VistaLINK<sup>®</sup>.

Alarms are listed in the order which they were received. The “Cor” column shows which faults have since corrected or cleared themselves. When an alarm is received, the border of the client will flash red, as will the device icon under the navigation tree. When the fault is cleared, the flashing will change to a green color. To clear the fault, it must be acknowledged by clicking the button in the “Ack” column.

### 4.3 CONFIGURING THE TALLY ROUTER

The TR-4800E tally router is configured through SNMP using the VistaLINK<sup>®</sup> Pro software. The various configuration tabs are listed in Table 3-1. Each of the screens and the configuration options are discussed in the following sections.

Tab Name	Description
General	Allows selecting the Wet voltage source
Front GPIO Settings	Only valid for units with the +BP16 front binding posts option.
Rear GPI Settings	Configures the General Purpose Inputs on the rear 37-pin D-Sub connectors.
Rear GPO Settings	Configures the General Purpose Outputs on the rear 37-pin D-Sub connectors.

**Table 3-1: VistaLINK<sup>®</sup> Pro Configuration Tabs**

#### 4.3.1 Selecting the Wet Voltage Source

The Wet voltage that is applied to the rear 37-pin D-Sub connectors and the front panel binding posts (+BP16 option only) can be selected in the “General” tab. See section 2.6 for more information. The selections are as follows:

- “None” - No wet power. The +WET and –WET connections will be high impedance (no voltage).
- “12 Volts” - The wet power will come from the internal +12V power source.
- “5 Volts” - The wet power will come from the internal +5V power source.
- “External” - The wet power will come from the WET PWR binding posts.

### 4.3.2 Configuring the Front GPIO Binding Posts (+BP16 option only)

When the TR-4800E has been ordered with the +BP16 option, there will be 16 GPIO available on the front panel through banana-type binding posts. Each of these GPIO can be configured as a GPI or a GPO, Wet or Dry. **Please refer to section 3.7 for more information.**

First select the GPIO (1-16) you wish to configure in the “Select Front Channel” control. Once the GPIO is selected, any changes below will be applied to that GPIO only. There are 7 controls that are used to configure each of the GPIO:

1. Configure the GPIO as an input (GPI) or output (GPO) using the “Input or Output” control.
2. Configure the GPIO as either Wet or Dry using the “Wet or Dry” control.

The next three controls only apply if the GPIO is configured as an output (GPO):

3. A GPO can be manually forced open or closed with the “Relay State” control. Note that if MAGNUM-TALLY is running it may immediately override this setting.
4. The GPO may be put into “Pulse” mode. In pulse mode, whenever the GPO is turned On, the GPO instead pulses On then goes back to Off.
5. If the GPO has pulse mode enabled, select the duration of the GPO On pulse with the “Front Panel Pulse Width” control. Note that all 16 GPIO share the same pulse width setting.

The last two controls only apply if the GPIO is configured as an input (GPI):

6. A GPI may be put into “Edge Trigger” mode. In edge trigger mode the GPI reports toggles its state when the GPI transitions between driven and undriven states.
7. When a GPI has edge triggering enabled, select the type of transition to toggle on by using the “Trigger Edge” control.
8. When the selected GPIO is configured as an input, the “Input Level” displays the current state of the GPI.

### 4.3.3 Configuring the Rear GPI

There are a total of 32 GPIs on the rear of the unit that are configured in the “Rear GPI Settings” tab. The GPI to be configured (1-32) is first select the “Select GPI” control. Once the GPI is selected, any changes below will be applied to that GPI only. There are 2 controls that are used to configure the GPI:

1. A GPI may be put into “Edge Trigger” mode with the “Trigger” control.
2. When a GPI has edge triggering enabled, the “Trigger Edge” control selects which transition the GPI will toggle its state upon.
3. The “Input Level” displays the current state of the selected GPI.

### 4.3.4 Configuring the Rear GPO

There are a total of 48 GPOs on the rear of the unit that are configured in the “Rear GPO Settings” tab. The GPO to be configured (1-48) is first select the “Select GPO” control. Once the GPO is selected, any changes below will affect that GPO only. There are 4 controls that are used to configure the GPO:

1. The “Relay State” control can be used to manually turn the GPO On or Off.
2. A GPO may be put into “Pulse” mode with the “Pulse” control.
3. When a GPO has pulse mode enabled, the “Pulse Width” control selects how long the GPO will turn On before turning back Off again. Note that all the GPO on a connector share the same pulse width setting.
4. The “Output Busy” will indicate the GPO is busy if it is in the middle of a pulse in “Pulse” mode.

## 5 OPERATION

The TR-4800E is designed to be integrated into the MAGNUM unified control system. This requires the addition of the MAGNUM-TALLY software option. This allows MAGNUM to interface with the TR-4800E to provide an intuitive, visual, point-and-click web page interface for managing the tally inputs and assigning actions to be performed when an input goes active. This can include, but is not limited to, automatically triggering actions on one or more tally outputs.

### 5.1 QUARTZ REMOTE CONTROL PROTOCOL

A full discussion on the Quartz protocol is outside the scope of this document. Please refer to Evertz application note AN65 for detail on the format of the Quartz protocol. The Quartz protocol control can be done through the Serial2 port, or more commonly through a TCP/IP connection. The MAGNUM control software uses Quartz protocol to integrate the tally inputs and outputs into a broader infrastructure control system.



**The Tally Router Quartz over IP port is 9676.  
Upon connection the tally router will automatically report the status of all GPIs.**

The General Purpose Inputs are mapped to level “V”, destinations 1-32. The front panel binding posts (+BP16 option) channels 1-16 are mapped to destinations 49-64. The tally router reports changes to GPIs by sending unsolicited “.U” update messages. For example, “.UV017,002” indicates that GPI 17 has been activated. The message “.UV017,001” indicates that GPI 17 has been deactivated. The status of any GPI can be queried by sending a Interrogate Destination message. The message “.IV005” will request the status of GPI 5. The tally router will respond with a “.AV005,00X” message.



**A source value of 1 means “Off”  
A source value of 2 means “On”**

The General Purpose Outputs are mapped to level “A”, destinations 1-48. The front panel binding posts (+BP16 option) channels 1-16 are mapped to destinations 49-64. The GPOs can be turned on by routing them to source 2. For example the command “.SA027,002” will turn on GPO 27. The tally router will respond with a “.UA027,002” to acknowledge the GPO has been changed. The command “.SA027,001” will turn off GPO 27 causing a response of “.UA027,001”.

## 5.2 MAGNUM INTEGRATION

The installation and configuration of a MAGNUM server is beyond the scope of this manual. The following steps assume that a functional MAGNUM server is licensed and operational. The MAGNUM server should be available on the network at a known IP address.

Launch a web browser of your choice (Firefox is recommended) and enter the IP address of the magnum server into the address bar followed by “/magnum”. For example:

`http://172.21.1.200/magnum`

This should open up the MAGNUM server web configuration tool. You must **Login** with a username and password. The default user name is “admin” with password “admin”.

### 5.2.1 MAGNUM-TALLY License

In addition to the normal MAGNUM license, the optional MAGNUM-TALLY license is required to allow MAGNUM to work with tally routers. Click the **ADMIN** button and select “License Management”. The minimum required licensed modules to use Magnum with Tally Routers are:

**Magnum-Router**  
**Magnum-Tally**  
**Magnum-Multiviewer**



**Figure 5-1 Magnum License Management Screen**

In order to add a license to magnum the Server ID is required. Press the “Get ID” button to obtain the Server ID. It will be 10 groups of 4 characters separated by dashes:

Example: 2a29-bc35-ea1a-c639-2f3f-c48e-7ef1-2a5f-6fb9-b31c

Contact Evertz customer support to add licensed modules to the Magnum server. You will obtain a license file (.etl) which can then be imported into the Magnum server.

### 5.2.2 Adding the Tally Router to MAGNUM

To add a new Tally router device click on the **SYSTEM** menu and select “Devices”.

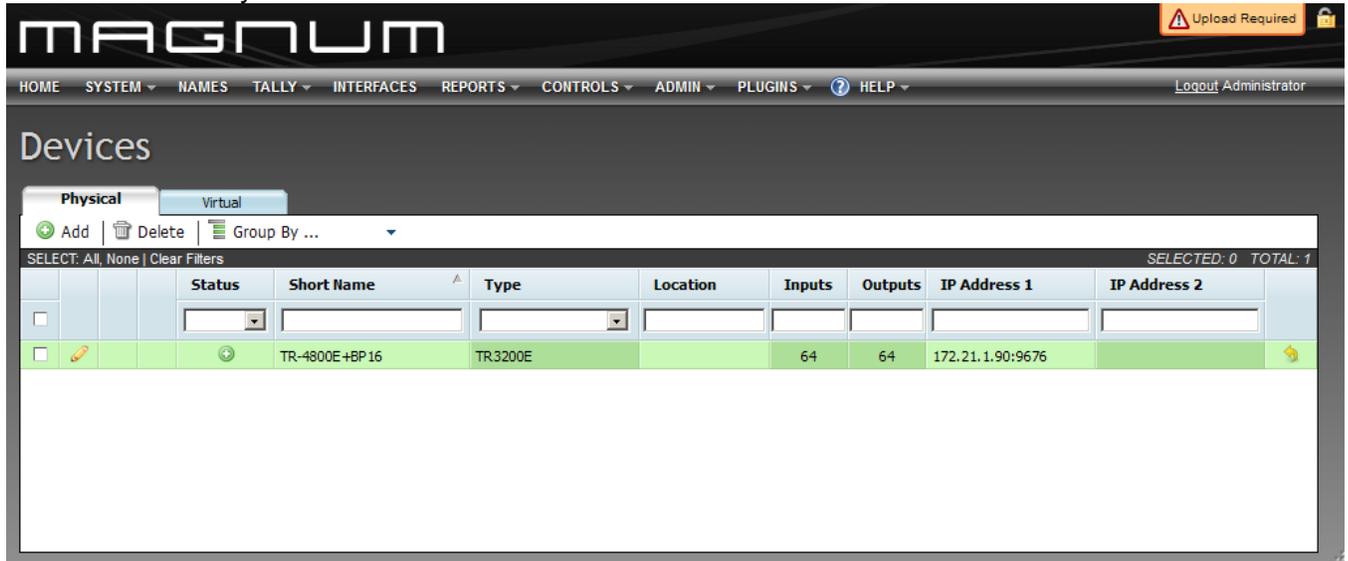


Figure 5-2 – Magnum Devices View

Click the **Add** button to configure a new device. Currently the Tally Router must be added as a **TR3200E**. Magnum uses the same control protocol for both the TR-3200E and the TR-4800E products. The only difference is the number of GPI and GPO available. The regular TR-4800E should be configured with 32 inputs and 48 outputs. The TR-4800E+BP16 should be configured for 64 inputs and 64 outputs. Enter the IP address of the tally router for the “Primary IP”. Make sure to use port 9676. Repeat this for every tally router in your system. Click **Done** when finished adding devices.

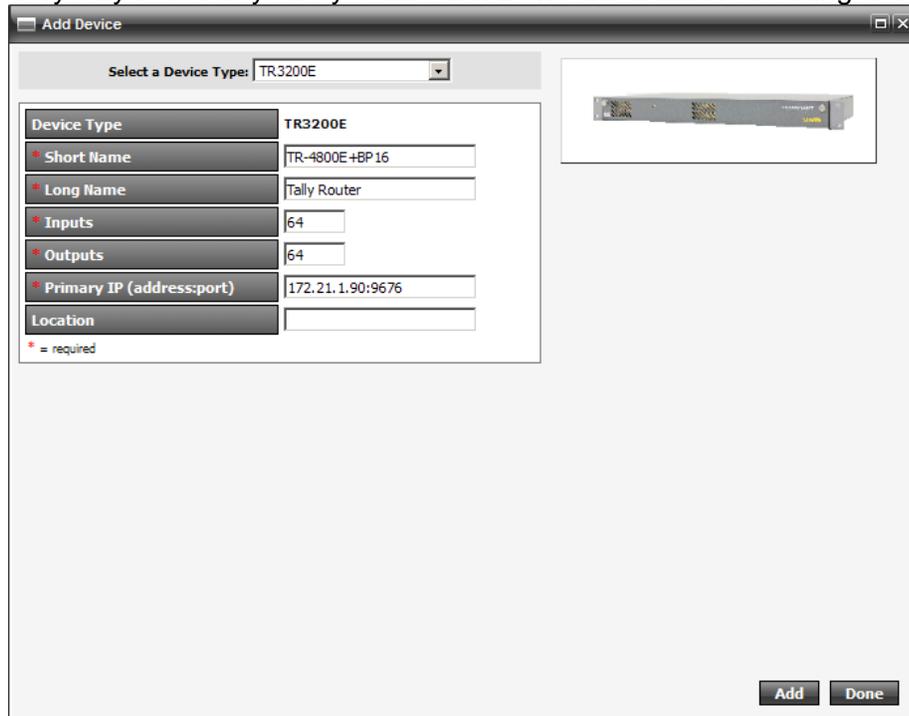


Figure 5-3 - Adding a Tally Router Device to Magnum

Once all devices are added, an **Upload Required** notice will appear in the top-right corner. Click on this and then commit the configuration changes to the Magnum server.

### 5.2.3 Setting up the MAGNUM Tally Grid

Once all devices are configured, the GPI and GPO on the Tally Routers can be linked to actions on routers or GPIO on other Tally Routers. To configure this, go to the **TALLY** menu and select **Grid**.

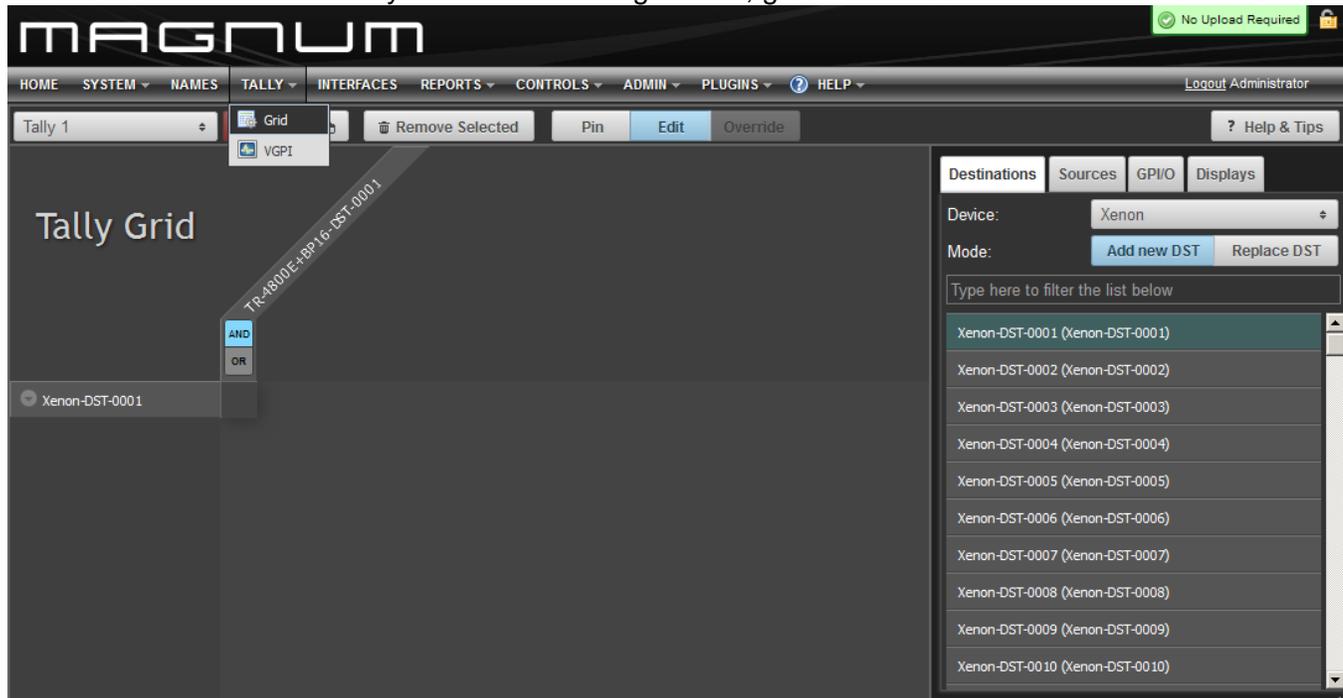


Figure 5-4 – Magnum Tally Grid Configuration View

Click on the **EDIT** button to make changes to the Tally Grid. The Tally Router devices will appear under the **GPI/O** tab on the right side of the screen. The Tally Router sources (SRC) are GPIs, and the tally router destinations (DST) are GPOs. All the configured router sources and destinations are shown as well. It is easy to map a router source change to a tally router destination (GPO) activation. Once changes have been made to the tally grid, the “Save Changes” button must be pressed.

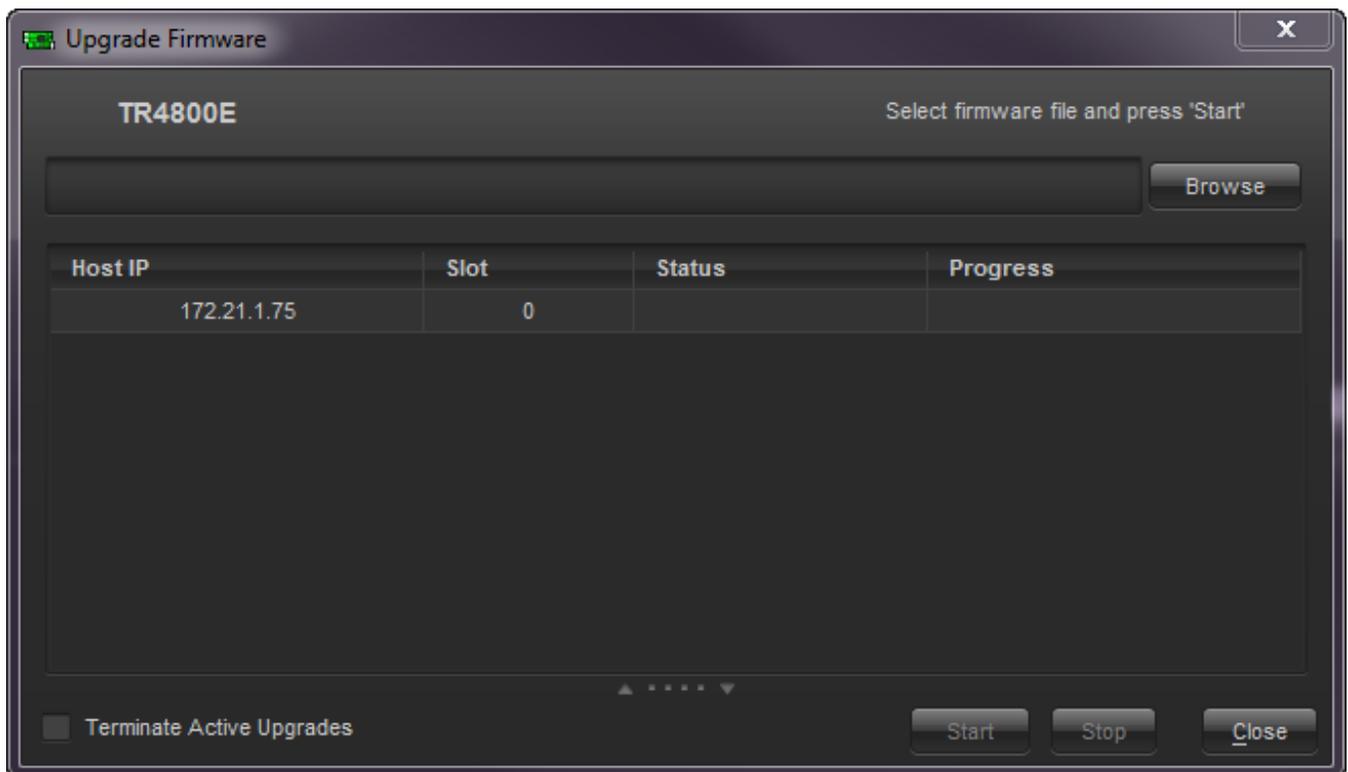
Multiple tally grids can be configured. The drop-down box selects between the tally grids. Only one grid can be active at a time. Click the “activate” button to make the current tally grid active. Once activated, Magnum will monitor all triggers and activate the selected GPOs in response in real-time.

### 5.3 UPGRADING THE FIRMWARE

The firmware in the TR-4800E is stored in a FLASH EEPROM. From time to time firmware updates will be provided to add additional features to the unit. Check the Evertz web site for information on firmware releases ([www.evertz.com](http://www.evertz.com)). The firmware is updated through the Ethernet port using VistaLINK® Pro. It can also be updated through the serial port. Note that each firmware update is released with a JAR file for updating VistaLINK® Pro. If the firmware is updated the JAR file must also be updated to match.

#### 5.3.1 Performing a Firmware Upgrade with VistaLINK® Pro

The upgrade is performed through the version information dialog (see section 3.2.1). This dialog also displays the current firmware version of the unit. Access this dialog in the VistaLINK® Pro client by going to the Tools menu, Products..., and selecting Version Information. Select the “Active” filter and click on the TR4800E. There is an “Upgrade” checkbox that should be checked for every unit that is being upgraded. Finally click the “Upgrade” button in the bottom-right corner.



**Figure 5-5: VistaLINK® Pro Upgrade Firmware Dialog**

Click the Browse button and select the new firmware BIN file that was downloaded from the Evertz website (Image file). Then click the Start button. Answer “Yes” if you are sure you want to upgrade. The firmware upgrade process should take around 20 seconds then the tally router will reboot itself.

### 5.3.2 Performing a Firmware Upgrade Through the Serial Port

A firmware upgrade can also be performed through the Serial 1 port. This takes much longer than through Ethernet, and will require the unit to be out of action for the duration of the upgrade. Connect the serial port to a PC and press ENTER to get to the “CLI>” Command Line Interface prompt.

The current software version can be displayed by typing “ver” and pressing ENTER.

```
CLI> ver

TR-4800E+BP16

Hardware
  Board       : 7700TR
  Product     : TR-4800E+BP16
  Rev         : 1
  Build       : 1
  Serial Number : 7327830009

Software
  Version     : 1.00
  Build       : 119
  Build Date  : 2015 Oct 02 16:17:34
CLI>
```

Type in the command “reset” and press ENTER. The tally router will reboot. Immediately press CTRL+X several times to stop the unit from booting again. This should break into the “PPCBOOT>” prompt. Type the command “upgrade” and press ENTER. You should see the message “upload product firmware now”. The firmware can now be sent to the tally router using the XMODEM protocol (checksum mode). This should take about 4 minutes to complete.

When the firmware is finished sending, you should see the message “upload okay”. At this point enter the command “boot” and press ENTER. The tally router will boot using the newly upgraded firmware.

```
CLI> reset
Evertz NAND PPCBoot et.836.3
Evertz PPCBoot 2.3 et.836.3
8313e rev. 2.2, e300c3 rev. 1.0, 167 MHz bus, 333 MHz core
PHY 01 REG 00: 1140 ---- 0143 BCB2 01E1 0000 0064 2001 0000 0300 0000 0000 0000
0000 0000 3000
PHY 01 REG 10: 0000 0001 0000 0000 0000 0000 0000 0000 0400 0000 0000 FFFF 0000
0000 0000 0000
PHY register 18 shadow 7 changed from 0x71E7 to 0xF0E7
PHY register 1c shadow 3 changed from 0x0E00 to 0x0E00
user requested abort
PPCBOOT> upgrade
upload product firmware now
upload okay
PPCBOOT> boot
LOADING PROGRAM SECTIONS
LOAD COMPLETE
```