

**2408RGBT/DVIT**  
**DVI and RGB Video/Audio**  
**Portable SFP Fiber Transmitter**  
**Instruction Manual**

© Copyright 2009

**EVERTZ MICROSYSTEMS LTD.**

5288 John Lucas Drive,  
Burlington, Ontario,  
Canada L7L 5Z9

Phone: 905-335-3700

Sales: [sales@evertz.com](mailto:sales@evertz.com)

Tech Support: [service@evertz.com](mailto:service@evertz.com)

Web Page: <http://www.evertz.com>

Fax: 905-335-3573

Fax: 905-335-7571

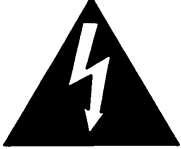

Version 1.1 October 2009

The material contained in this manual consists of information that is the property of Evertz Microsystems and is intended solely for the use of purchasers of the 2408RGBT/DVIT. Evertz Microsystems expressly prohibits the use of this manual for any purpose other than the operation of the 2408RGBT/DVIT.

All rights reserved. No part of this publication may be reproduced without the express written permission of Evertz Microsystems Ltd. Copies of this manual can be ordered from your Evertz dealer or from Evertz Microsystems.



## 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 this information
- 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, 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, one blade being 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 (i.e. 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 ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

### **WARNING**

DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS ARE PLACED ON THE EQUIPMENT.

### **WARNING**

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE PLUG FROM THE DUAL POWER SUPPLIES AC RECEPTACLE.

### **WARNING**

THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

## **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 must be used

## TABLE OF CONTENTS

<b>1. OVERVIEW.....</b>	<b>1</b>
<b>1.1. SETTING UP THE DDC VALUE .....</b>	<b>3</b>
<b>2. INSTALLATION.....</b>	<b>4</b>
<b>2.1. OPTICAL CONNECTIONS.....</b>	<b>5</b>
<b>2.2. SIGNAL CONNECTIONS .....</b>	<b>5</b>
<b>2.3. INTERFACING WITH 3G OPTICAL ROUTER.....</b>	<b>5</b>
<b>2.4. CARE AND HANDLING OF OPTICAL FIBER.....</b>	<b>7</b>
2.4.1. Safety .....	7
2.4.2. Assembly.....	7
2.4.3. Labeling.....	7
2.4.4. Handling and Connecting Fibers.....	8
<b>3. SPECIFICATIONS.....</b>	<b>9</b>
<b>3.1. ANALOG VIDEO INPUTS .....</b>	<b>9</b>
<b>3.2. DIGITAL VIDEO INPUTS .....</b>	<b>9</b>
<b>3.3. DIGITAL VIDEO CONTROL.....</b>	<b>9</b>
<b>3.4. ANALOG AUDIO INPUTS (A2 VERSION).....</b>	<b>9</b>
<b>3.5. OPTICAL OUTPUT.....</b>	<b>10</b>
<b>3.6. ELECTRICAL .....</b>	<b>10</b>
<b>3.7. PHYSICAL .....</b>	<b>10</b>
<b>4. CARD-EDGE MONITORING AND CONTROL .....</b>	<b>11</b>
<b>4.1. ACCESSING THE TOGGLE SWITCH AND PUSH BUTTON.....</b>	<b>11</b>
<b>4.2. CARD EDGE OPERATION .....</b>	<b>12</b>
<b>4.3. STATUS INDICATOR LEDS .....</b>	<b>14</b>
<b>4.4. CARD-EDGE DISPLAY AND CONTROLS.....</b>	<b>14</b>
4.4.1. Card-Edge Display Warning Indications.....	15
4.4.2. Selecting the Output Laser Control Mode .....	16
4.4.3. Setting the RGB Output Video Sharpness (2408RGBT Models Only) .....	16
4.4.4. Selecting Link Rate .....	16
4.4.5. Setting Input RGB Gain (2408RGBT Models Only) .....	17

4.4.6.	Selecting the Display Data Channel Mode (2408RGBT Models Only) .....	17
4.4.7.	Setting the Analog Audio Detection Threshold (A2 Version).....	18
4.4.8.	Setting the Analog Audio Detection Duration (A2 Version) .....	18
4.4.9.	Selecting Identity Mode .....	18
4.4.10.	Setting the ID Tag .....	19
4.4.11.	Setting the Orientation of the Text on the Card Edge Display.....	19
4.4.12.	Displaying Input Signal Resolution.....	19
4.4.13.	Displaying the RGB Output Video Sharpness (2408RGBT Models Only) .....	20
4.4.14.	Displaying the Selected Display Data Channel Mode (2408RGBT Models Only).....	20
4.4.15.	Displaying the Video Input Sync (2408RGBT Models Only) .....	20
4.4.16.	Displaying the Selected Link Rate.....	20
4.4.17.	Displaying the Selected ID Tag .....	21
4.4.18.	Displaying the Firmware Version.....	21
5.	<b>JUMPER CONTROLS.....</b>	<b>22</b>
5.1.	<b>CONFIGURING THE MODULE FOR FIRMWARE UPGRADES .....</b>	<b>22</b>
6.	<b>VISTALINK® REMOTE MONITORING/CONTROL .....</b>	<b>23</b>
6.1.	<b>WHAT IS VISTALINK®? .....</b>	<b>23</b>
6.2.	<b>VISTALINK® MONITORED PARAMETERS .....</b>	<b>23</b>
6.3.	<b>VISTALINK® CONTROLLED PARAMETERS .....</b>	<b>24</b>
6.4.	<b>VISTALINK® TRAPS.....</b>	<b>25</b>

**Figures**

Figure 1-1: 2408RGBT Block Diagram .....	2
Figure 1-2: 2408DVIT Block Diagram .....	2
Figure 2-1: 2408RGBT I/O CONNECTIONS .....	5
Figure 2-2: Setup Using an Optical Router .....	6
Figure 2-3: Reproduction of Laser Certification and Identification Label .....	7
Figure 4-1: Identifying Top Screws.....	11
Figure 4-2: Screws on Bottom of Unit .....	11
Figure 4-3: Inside View of Unit .....	12
Figure 4-4: Location of Status Indicators and Jumpers .....	13
Figure 4-5: 2408RGBT Card Edge Menu.....	15

**Tables**

Table 1-1: Sample Typical Fiber Application Configurations .....	2
Table 6-1: <i>VistaLINK</i> <sup>®</sup> Monitored Parameters.....	23
Table 6-2: <i>VistaLINK</i> <sup>®</sup> Controlled Parameters .....	24
Table 6-3: <i>VistaLINK</i> <sup>®</sup> Traps .....	25

## WARNING



Never look directly into an optical fiber. Irreversible eye damage can occur in a matter of milliseconds.



## REVISION HISTORY

<b><u>REVISION</u></b>	<b><u>DESCRIPTION</u></b>	<b><u>DATE</u></b>
1.0	First Release	Sept 09
1.1	Added 2408DVIT options, updated electrical specifications.	Oct 09

Information contained in this manual is believed to be accurate and reliable. However, Evertz assumes no responsibility for the use thereof nor for the rights of third parties, which may be affected in any way by the use thereof. Any representations in this document concerning performance of Evertz products are for informational use only and are not warranties of future performance, either expressed or implied. The only warranty offered by Evertz in relation to this product is the Evertz standard limited warranty, stated in the sales contract or order confirmation form.

Although every attempt has been made to accurately describe the features, installation and operation of this product in this manual, no warranty is granted nor liability assumed in relation to any errors or omissions unless specifically undertaken in the Evertz sales contract or order confirmation. Information contained in this manual is periodically updated and changes will be incorporated into subsequent editions. If you encounter an error, please notify Evertz Customer Service department. Evertz reserves the right, without notice or liability, to make changes in equipment design or specifications.

*This page left intentionally blank*

## **1. OVERVIEW**

The 2408RGBT RGB/DVI SFP Fiber Transmitter extends one digital (DVI) or analog (RGB) video display connection over a single fiber optic or coaxial link, with display resolutions up to WUXGA (1920 x 1200). The DVI-I connector combines analog and digital display technologies, promoting optimum compatibility with different display types. Two optional analog audio inputs are also available. The 2408RGBT is designed to operate with a companion 2408RGBR receiver to allow communication over fiber optic cable with minimal latency.

The 2408DVIT provides the same features listed above, however, it only accepts a digital (DVI) input.

Monitoring and control of the card status and parameters are provided locally at the card-edge, or remotely via *VistaLINK*® capability.

The 2408RGBT/DVIT uses Evertz SFP modules to interface to the fiber optic domain. SFP transmitters are available in 1310nm, 1550nm, and CWDM wavelengths.

### **Features:**

- Digital (DVI) and analog (RGB) display technologies are supported through one interface on the 2408RGBT
- 2970Mb/s and 3125Mb/s user selectable Link Rates for routing and normal applications
- VESA video resolutions supported up to WUXGA (1920x1200)
- Two optional analog audio inputs
- Full 24 bits per pixel colour resolution
- True DC restoration with AGC for analog RGB input signals
- Ideal for use with high resolution LCD, plasma or projection screens
- Full-bandwidth 3 Gb/s signal transport over fiber – no compression or sub-sampling
- Evertz SFP modules are fully hot swappable from rear plate
- 7708RGBT is fully hot swappable from front of frame
- All configuration settings are controlled locally through the card-edge user interface, or remotely through *VistaLINK*®
- Comprehensive signal and card status monitoring are available locally on the four-digit card-edge display, or remotely through *VistaLINK*®
- Optical output wavelengths of 1310nm, 1550nm, and up to sixteen CWDM wavelengths (ITU-T G.694.2 compliant)
- Selectable continuous or discontinuous laser operation modes

Fiber Type	Optical/Link Budget	Transmit Side		Receive Side		Description
		Ordering Product Info	TX Power	Ordering Product Info	RX Sensitivity	
Multi-Mode	< 500m	2408RGBT-A2+13	-1dBm	2408RGBR-A2	-20dBm	1310nm on Tx and Rx fibers
Single-Mode	12dB/34km	2408RGBT-A2+13	-1dBm	2408RGBR-A2	-20dBm	1310nm on Tx and Rx fibers
Single-Mode	18.5dB/53km**	2408RGBT-A2+Cxx	+2dBm	2408RGBR-A2	-20dBm	Different CWDM Wavelengths for Tx & Rx, with 8Ch CWDM Mux/Demux**

\*\* Assumes 8Ch CWDM Mux/Demux loss of 3.5dB

Tx Power/Rx Sensitivity are nominal values of  $\pm 1$ dBm  
Fiber loss = 0.35/0.25dB per km @ 1310nm/1550nm

Table 1-1: Sample Typical Fiber Application Configurations

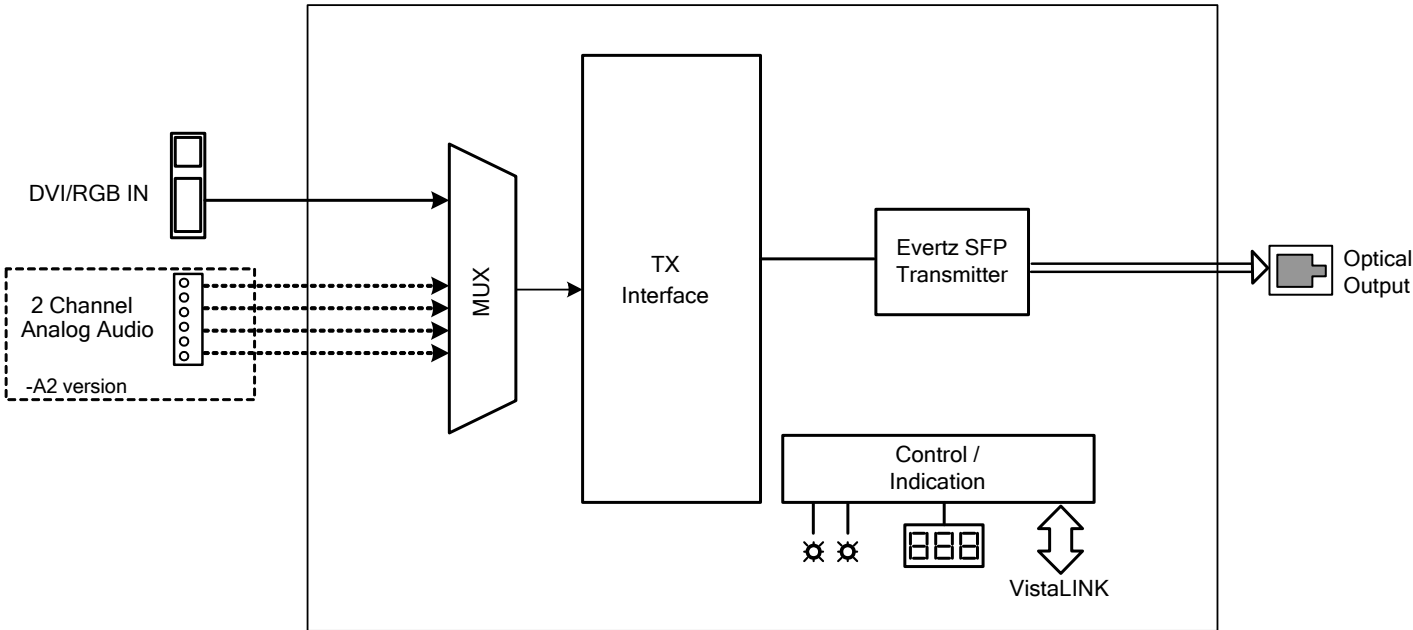


Figure 1-1: 2408RGBT Block Diagram

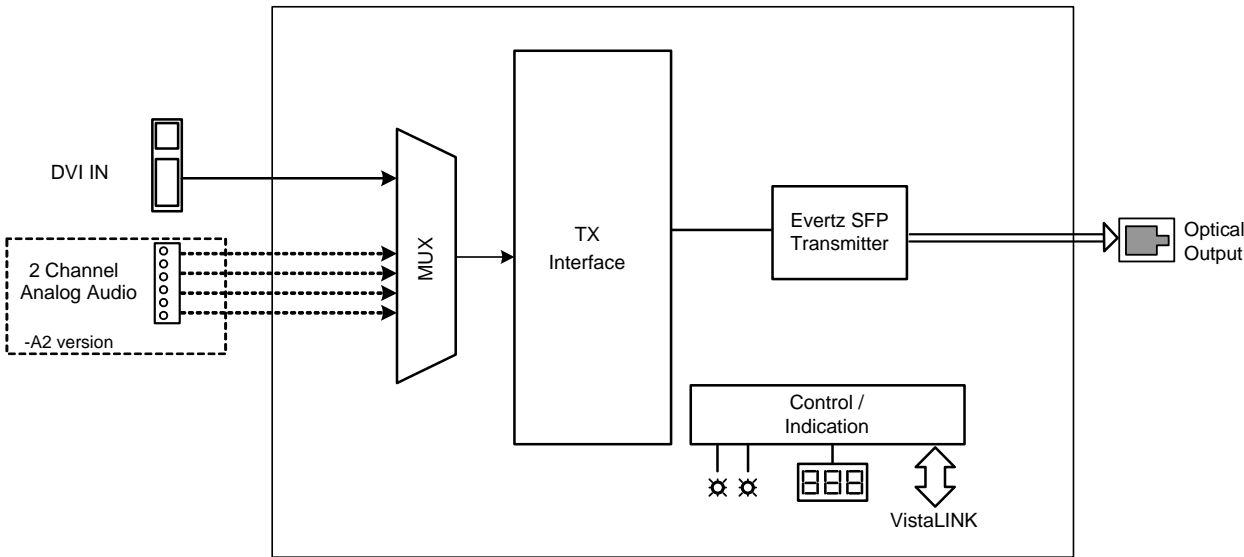


Figure 1-2: 2408DVIT Block Diagram

### 1.1. SETTING UP THE DDC VALUE

DDC (Display Data Channel) is a series of protocols that enables plug and play communication between a graphics adapter and a computer monitor. It allows the display to communicate its supported display modes and display parameters to the graphics adapter.

The DDC emulation mode will need to be set on the transmitter card (RGBT/DVIT) before plugging a PC into the RGBT/DVIT card. If the DDC is subsequently changed then a full re-boot will need to occur to allow the DDC change to take effect.

1. Ensure that the PC is off or not connected to the RGBT/DVIT card.
2. Set the DDC emulation mode depending on your system configuration:

**LCD:** Emulate display with digital (DVI) input and output.

**CRTA:** Emulate display with analog (RGB) input and analog (RGB) output.

**CRTD:** Emulate display with analog (RGB) input and digital (DVI) output.

3. Connect the PC to the RGBT/DVIT card and power on the computer.

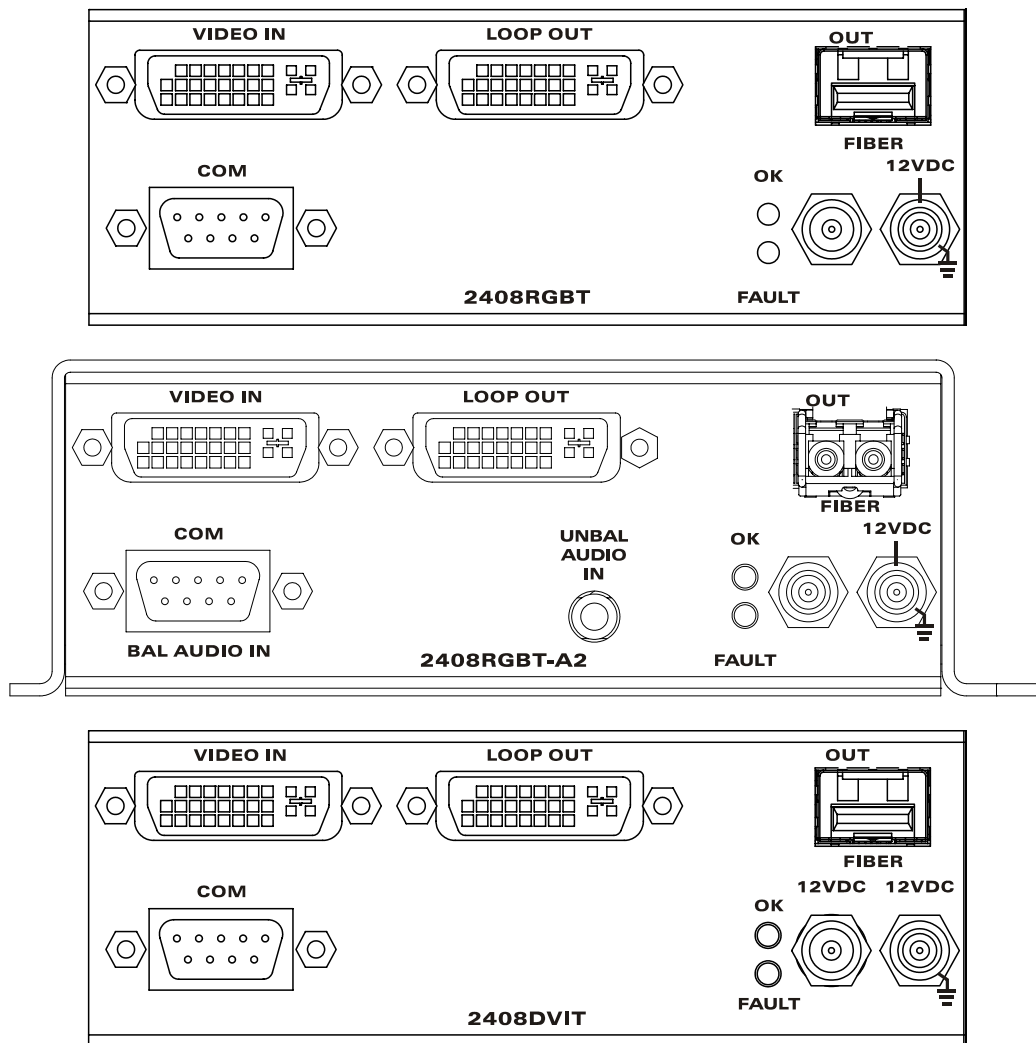


<p><b>Please note: The DDC setting can not be set and applied while the PC is on and connected to the RGBT card. Please ensure that the PC is not connected or is turned off when changing the DDC.</b></p>
---

## 2. INSTALLATION

The 2408RGBT/DVIT modules are stand-alone units that have one DVI-I video connector and (depending on the options ordered) may also have analog audio terminals. In addition, there is a dual channel LC/PC SFP slot to house an Evertz transmitter SFP. On the 2408RGBT models only, the DVI-I connector supports combined analog and digital video through a single interface. An industry-standard DB-15 connector adapter may be used for RGB. Figure 2-1 shows all rear plate options for the 2408RGBT/DVIT.

When installing the Evertz SFP module into the rear plate SFP housing, align the transmit and receive arrow indicators UPWARDS with the 2408RGBT/DVIT module upright. Gently slide the SFP module into the rear plate SFP housing until it clicks into place.



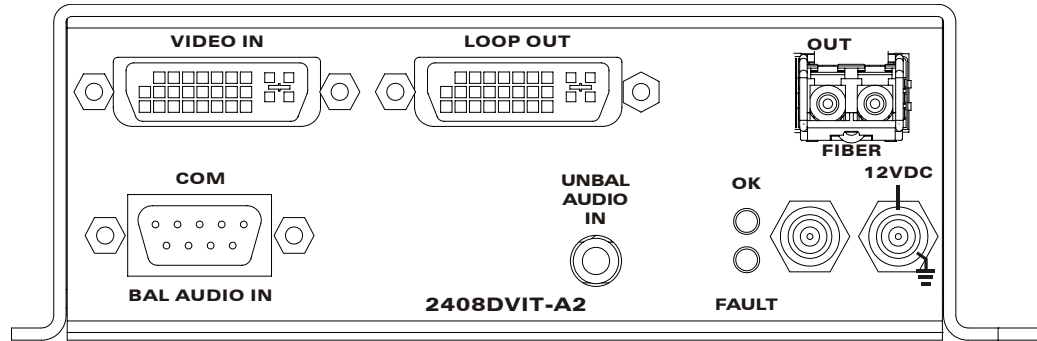


Figure 2-1: 2408RGBT I/O CONNECTIONS

## 2.1. OPTICAL CONNECTIONS

**SFP FIBER OUTPUT:** There is one LC/PC female connector when the 7708RGBT/DVIT is equipped with an Evertz Transmitter SFP module. The optical output is available in 1310nm, 1550nm, and CWDM (ITU-T G.694.2 compliant) wavelengths. This connector is compatible with multimode fiber when connected directly to a companion 2408RGBR/DVIR receiver.

## 2.2. SIGNAL CONNECTIONS

**VIDEO INPUT:** The 2408DVIT accommodates digital DVI input signals only. The 2408RGBT DVI-I connector accommodates analog and digital display technologies, promoting optimal compatibility with different display types. Input DVI signals may be connected directly to this port. A DB-15 RGB connection may also be accommodated using an industry standard DB-15 to DVI-I adapter such as the Belkin F2E4162, or appropriately terminated cable assembly such as the Amp 16539332-1.

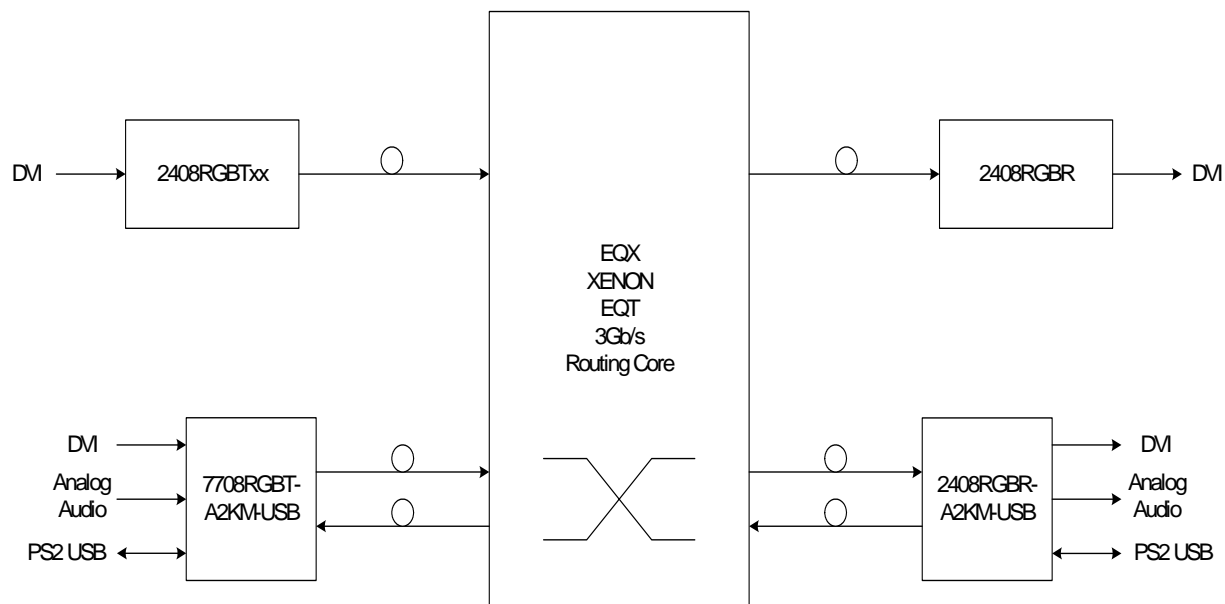


**Note:** When making digital DVI connections, Evertz recommends using only high quality DVI cables, no longer than 6 feet (1.8m).

**AUDIO INPUTS (A2 Version):** The 2408RGBT/DVIT-A2 module provides a terminal block for input connections compatible with either balanced or unbalanced analog audio. Balanced audio signals should be connected to the positive (+) and negative (-) input terminals. Unbalanced audio signals should be connected to the positive (+) input terminal, and a jumper connection should be installed between the negative (-) input terminal and the ground terminal ( $\perp$ ).

## 2.3. INTERFACING WITH 3G OPTICAL ROUTER

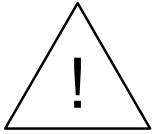
Figure 2-2 illustrates a typical setup using an optical router with a bidirectional 7708RGBT/DVIT transmitter and a compatible 2408RGBR/DVIR receiver. To ensure proper system operation in bidirectional configurations, it is important that the Tx OUT and Rx OUT are both switched at the same time. This should be taken into account when programming router salvo operations. Note that A2KM-USB transmitter versions can only be routed to A2KM-USB receiver versions and Non-A2KM-USB transmitter versions can only be routed to Non-A2KM-USB receivers.

**Figure 2-2: Setup Using an Optical Router**



## **2.4. CARE AND HANDLING OF OPTICAL FIBER**

### **2.4.1. Safety**



Background colour: yellow  
Triangular band: black  
Symbol: black

**CLASS 1 LASER PRODUCT**

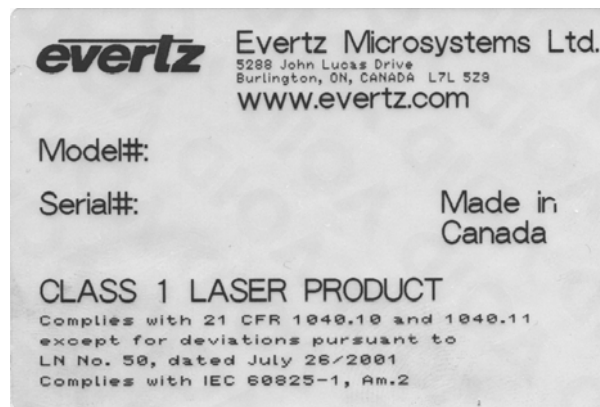
### **2.4.2. Assembly**

Assembly or repair of the laser sub-module is performed only at the Evertz facility by qualified Evertz technical personnel.

### **2.4.3. Labeling**

Certification and Identification labels are combined into one label. As there is not enough room on the product to place the label, it is reproduced here in the manuals.

- There is no date of manufacture on this label as it can be traced by the bar code label placed on the printed circuit board of each Evertz plug-in module.
- The model number is one of: 2408RGBT/DVIT+13, 2408RGBT/DVIT-A2+13, 2408RGBT/DVIT+Cxx, 2408RGBT/DVIT-A2+Cxx(xx = 27, 29, 31, 33, 35, 37, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61) with additional suffixes as above.



**Figure 2-3: Reproduction of Laser Certification and Identification Label**

#### 2.4.4. Handling and Connecting Fibers



**Never touch the end face of an optical fiber. Always keep dust caps on optical fiber connectors when not connected and always remember to clean the optical end face of a connector properly before making a connection.**

The transmission characteristics of the fiber are dependent on the shape of the optical core and therefore care must be taken to prevent fiber damage caused by heavy objects or abrupt fiber bending. Evertz recommends that you maintain a minimum bending radius of 5 cm to avoid fiber-bending loss that will decrease the maximum attainable distance of the fiber cable. Evertz fiber optic modules come with lockout devices to prevent the user from damaging the fiber connector by installing a module into a slot in the frame that does not have a suitable rear plate. For further information about care and handling of fiber optic cable, see section 3 of the Fiber Optics System Design section of this manual binder.

### 3. SPECIFICATIONS



Video and audio performance specifications are measured at the output of a companion 2408RGBR/DVIR Receiver.

#### 3.1. ANALOG VIDEO INPUTS

Number of Signals:	1
Signal Type:	RGB
Sync Type:	H and V, or Sync on Green
Connector:	DVI-I with Analog or 15-pin HD-15 VGA Analog (with adapter)
Display Resolution:	Up to WUXGA, 1920x1200 @ 75Hz
Colour Depth:	24 Bit
Analog Bandwidth:	300MHz (max)
Impedance:	75Ω
SNR:	>55dB
Input Level:	1Vp-p (max)
Linear Distortion:	2% (max)
Intensity Distortion:	2% (max)

#### 3.2. DIGITAL VIDEO INPUTS

Number of Signals:	1
Signal Type:	TMDS, per DVI specification
Connector:	DVI-I
Display Resolution:	Up to WUXGA, 1920x1200 @ 75Hz
Colour Depth:	24-Bit

#### 3.3. DIGITAL VIDEO CONTROL

Number of Signals:	1
Signal Type:	DDC2B, per DVI specification
Connector:	DVI-I

#### 3.4. ANALOG AUDIO INPUTS (A2 VERSION)

Number of Signals:	2
Connector:	Removable Terminal Block
Input Level:	+24dBu (max)
Input Impedance:	20kΩ (min, differential)
Frequency Response:	±0.1dB (max, 20Hz to 20KHz)
THD:	< 0.005% (max, 20Hz to 20KHz, @ 0dBFS)
S/N Ratio:	>85dB (min)
Channel Phase:	±1° (max, 20Hz to 20KHz)
Signal Quantization:	24 bits

**3.5. OPTICAL OUTPUT**

**Connector:** LC/PC (female)  
**Fiber Size and Type:** Single Fiber versions: 9  $\mu$ m core / single mode  
**Output Wavelengths:**  
    **Standard:** 1310nm, 1550nm (nominal)  
    **CWDM:** 1270nm to 1610nm (ITU-T G.694.2 compliant)  
**Output Power:**  
    **1310nm FP (Standard):** -1 dBm  $\pm$ 1dBm  
    **CWDM DFB:** +2 dBm  $\pm$ 1dBm

**3.6. ELECTRICAL**

**Voltage:** 12V DC (nominal)  
**Power:** 11 Watts (max)

**3.7. PHYSICAL****Stand Alone units**

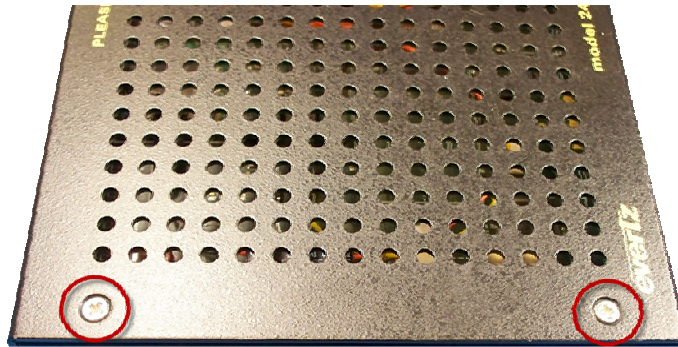
**Dimensions**  
**With Flanges:** 7.81" L x 5.63" W x 1.75" H  
(199mm L x 143mm W x 45mm H)

## 4. CARD-EDGE MONITORING AND CONTROL

### 4.1. ACCESSING THE TOGGLE SWITCH AND PUSH BUTTON

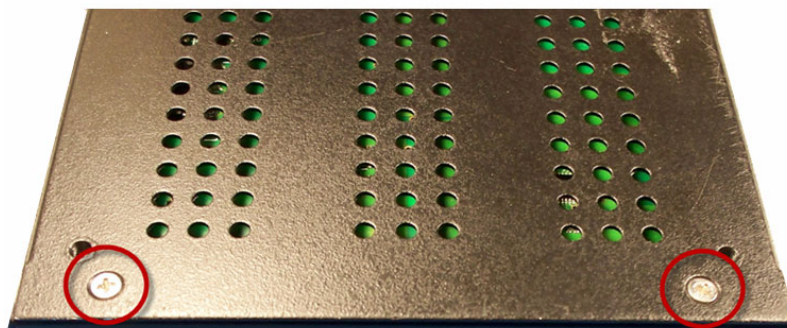
To expose the card edge controls you must remove the side panel. To do so, follow the instructions listed below:

1. Locate the two screws on the top (near the front) of the 2408 unit, as shown in Figure 4-1.
2. Remove these two screws (highlighted in Figure 4-1 with red circles).



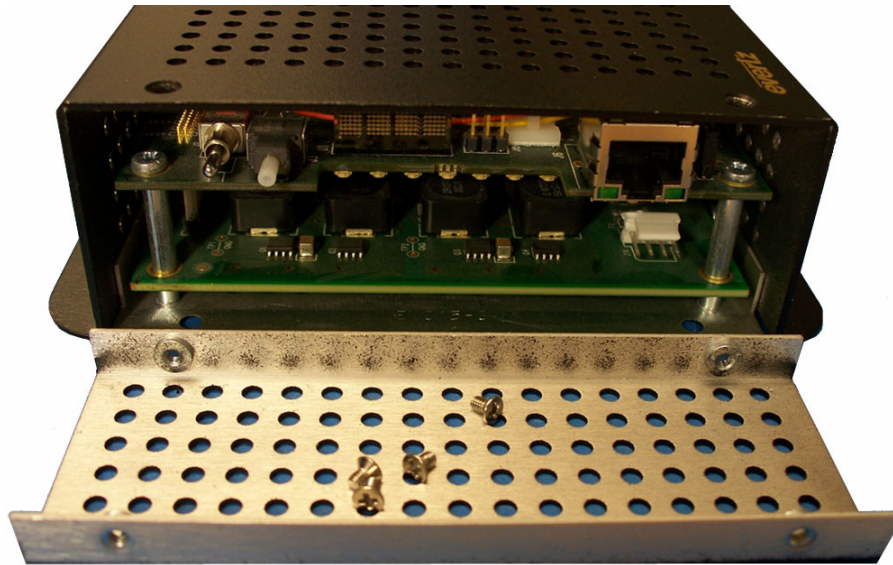
**Figure 4-1: Identifying Top Screws**

3. Flip the unit on its back and note the two screws at the bottom (near the front) of the 2408 unit, as shown in Figure 4-2.
4. Remove these two screws (highlighted in Figure 4-2 with red circles).



**Figure 4-2: Screws on Bottom of Unit**

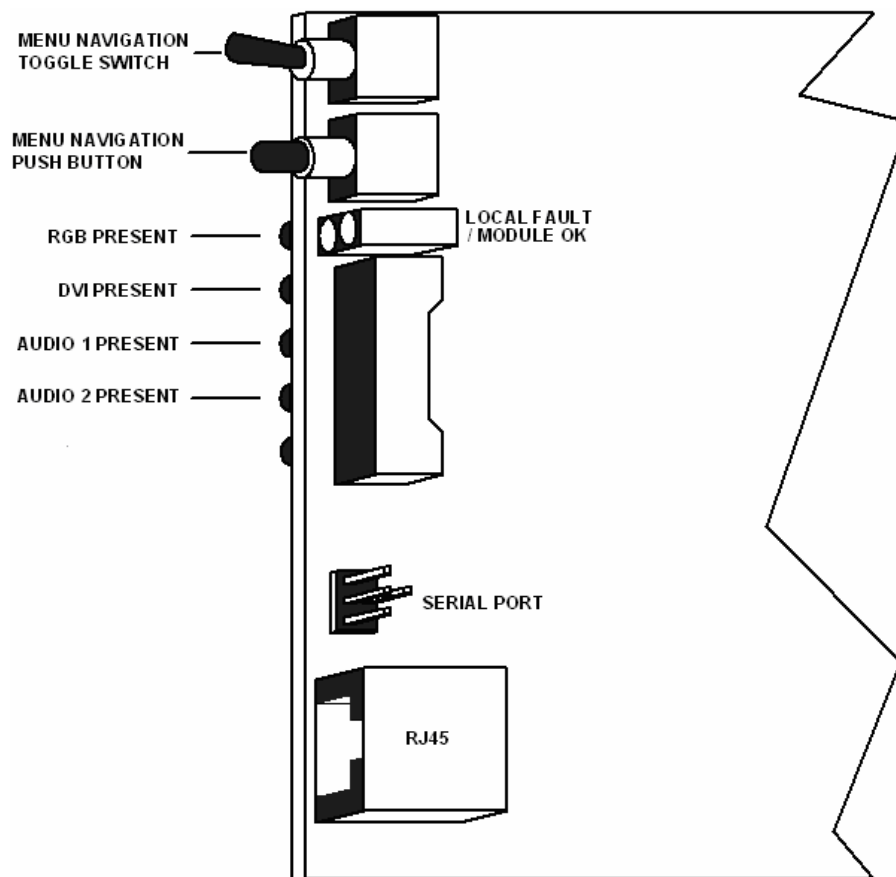
5. Gently pull the front panel outwards from the frame.
6. With the side panel removed, the toggle switch and push button are exposed to perform unit functions.



**Figure 4-3: Inside View of Unit**

#### **4.2. CARD EDGE OPERATION**

The 2408RGBT/DVIT has six LED status indicators and a four-digit dot-matrix display on the front card-edge to show the card's operational status at a glance. The card-edge pushbutton and toggle switch are used to select various control and status indicators on the dot-matrix display. Figure 4-4 shows the locations of the indicators and controls.



**Figure 4-4: Location of Status Indicators and Jumpers**

### 4.3. STATUS INDICATOR LEDS

**LOCAL FAULT:** This red LED indicates poor module health. Several conditions could cause this fault indication to be active:

- Laser fault
- Input video not present
- A card power fault exists (i.e. a blown fuse)

This LOCAL FAULT indication can also be reported to the frame by setting the FRAME STATUS jumper.

**MODULE OK:** This green LED indicates good module health. It will be on while the output laser is operating properly, and the card power is good.

**RGB PRESENT:** This green LED indicates the presence of an analog video input signal.

**DVI PRESENT:** This green LED indicates the presence of a digital video input.

**AUDIO PRESENT (A2):** These two green LEDs indicate the signal presence of the two respective audio input channels. Signal presence indication considers the audio detection threshold set by the user. Refer to section 4.4.7 for details about setting the audio detection threshold.

### 4.4. CARD-EDGE DISPLAY AND CONTROLS

Additional signal and status monitoring is provided via the four-digit dot-matrix display located at the card-edge. The card-edge pushbutton and toggle-switch are used to navigate through the display menu. Figure 4-5 provides a quick reference to the display menu structure.

Pressing the pushbutton advances the display to the next menu level. The toggle-switch may then be used to move up or down through selections of that menu level. Select **BACK** to return to the top menu level.

**CTRL** menu items have user-adjustable configuration values associated with them. **STAT** menu items display operating conditions or configuration values, but do not allow adjustment.

If a specific menu selection has a configuration value associated with it, then this may be changed using the toggle switch. Pressing the pushbutton will apply the displayed value and return you to the previous menu level.

The most recent user selection will be maintained in non-volatile memory in the event of power loss to the module.



Level 1	Level 2	Level 3	Level 4	NOTES
<b>LASR FAIL VID LOS OK</b>	BACK			All
	<b>CTRL</b>	BACK		All
		LASR (Laser)	CONT DISC	All
		SHAR (Sharpness)	0 to 63 (Only when RGB Pres)	All
		LINK (Link Rate)	2970 3125	All
		AVIN (RGB Gain)	1.00 to 2.00	All
		DDC (Display Data Channel)	LCD	All
			CRTA	
			CRTD	
		DET (Analog Audio Detection Threshold)	10 to -30	RGBT-A2
		DUR (Analog Audio Detection Duration)	1 to 20	RGBT-A2
		IDEN	ON OFF	All
		ID (Module ID Tag)	00000 to 7FFFE	All
		DISP (Display)	VERT	All
			HORZ	
	<b>STAT</b>	BACK		All
		RES	Res - Freq	All
		SHAR	0 thru 64	All
		DDC	LCD, CRTA, CRTD	All
		ISNC	SOG, or HV	All
		LINK	2970 or 3125	All
		ID	00000 to 7FFFE	All
		VER	Firmware Version	All

Figure 4-5: 2408RGBT Card Edge Menu

#### 4.4.1. Card-Edge Display Warning Indications

There are flashing warning indicators that may appear on the display of the 2408RGBT/DVIT. These warning indicators can overwrite other displayed text. Pressing the pushbutton will clear a warning indicator from the display and allow access to other menu items. Possible warning indicators are:

<b>LASR ERR</b>	Laser error - warns of laser end-of-life condition
<b>TYPE ERR</b>	Type error - warns of Input errors
<b>LINK...LOSS</b>	Optical link not established
<b>OK</b>	Optical link established, no video input or laser problems

#### 4.4.2. Selecting the Output Laser Control Mode

In some applications, it is beneficial to disable the laser output with no input signal present. Alternatively, it may be preferable to maintain an optical output signal, even with no input. The 2408RGBT/DVIT supports both modes of operation.

CTRL
LASR
CONT
DISC

To configure the *Laser Control* mode, select the CTRL menu item in the first menu level. Use the toggle switch to select the LASR menu item and press the pushbutton. The toggle switch can then be used to change the mode of operation. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

CONT	Continuous operation. Laser is always enabled, even without an active input signal.
DISC	Discontinuous operation. Laser is disabled when no active input signal is detected.

The factory default configuration applies the CONT mode of laser enable.

#### 4.4.3. Setting the RGB Output Video Sharpness (2408RGBT Models Only)

This menu item allows control over the sharpness of the RGB video output at the 2408RGBR receiver. Note that this menu item is only available when there is RGB video input present at the 2408RGBT.

CTRL
SHAR
0 to 31

To control the *Sharpness*, select the CTRL menu item in the first menu level. Use the toggle switch to select the SHAR menu item and press the pushbutton. The toggle switch can then be used to set the value. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

0-31:	Output RGB video sharpness
-------	----------------------------

#### 4.4.4. Selecting Link Rate

In applications with 3G routing, the *Link Rate* of the 2408RGBT/DVIT must be 2970Mb/s to be compatible with 3G routers. Two user selectable *Link Rates* may be chosen, 2970Mb/s for routing purposes and 3125Mb/s for normal operation.

CTRL
LINK
2970
3125

To configure the *Link Rate*, select the CTRL menu item in the first menu level. Use the toggle switch to select the LINK menu item and press the pushbutton. The toggle switch can then be used to change the mode of operation. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

2970:	Sets the Link Rate to 2970Mb/s for use with 3G routers.
3125:	Sets the Link Rate to 3125Mb/s for normal operation.

#### 4.4.5. Setting Input RGB Gain (2408RGBT Models Only)

When RGB video is applied, the *Input ADC Gain* level can be adjusted to affect the brightness of the RGB video seen out of the 2408RGBR. The affect of this menu item is seen when 2 sets of 2408RGBTs and 2408RGBRs are connected in sequence.

CTRL
AVIN
GAIN
1.00 to 2.00

To configure *Input RGB Gain*, select the CTRL menu item in the first menu level. Use the toggle switch to select the GAIN menu item and press the pushbutton. The toggle switch can then be used to change the mode of operation. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

1.00 to 2.00: Input RGB Gain

#### 4.4.6. Selecting the Display Data Channel Mode (2408RGBT Models Only)

The *Display Data Channel* is a digital connection between a computer display and the graphics adapter that allows the display to communicate its specifications to the adapter. The 2408RGBT can emulate either a display with a digital input connection (DVI – to be used when connecting to a graphics adapter with DVI output) or a display with an analog input connection (RGB – to be used when connecting to a graphics adapter with RGB output).

CTRL
DDC
CRTA
CRTD
LCD

To configure the *Display Data Channel*, select the CTRL menu item in the first menu level. Use the toggle switch to select the DDC menu item and press the pushbutton. The toggle switch may then be used to change the value. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

**LCD** DDC set to emulate display with digital (DVI) input and output.  
**CRTA** DDC set to emulate display with analog (RGB) input and analog (RGB) output.  
**CRTD** DDC set to emulate display with analog (RGB) input and digital (DVI) output.

#### 4.4.7. Setting the Analog Audio Detection Threshold (A2 Version)

Two card-edge LEDs indicate signal presence of the two respective analog audio channels. A *Detection Threshold* is used to indicate audio signal presence. The *Audio Detection Threshold* adjustment is implemented in the digital domain, and applies to both channels. The range of threshold adjustment is –30dBu to +10dBu, in 1dB increments. Threshold adjustment is completed using the card-edge interface or through *VistaLINK®* control.

CTRL
DET
-30 to +10

To change the *Audio Detection Threshold*, select CTRL, the first menu item in menu level. Use the toggle switch to select the DET menu item and press the pushbutton. The toggle switch may then be used to change the threshold value. Select the desired value then press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

-30 to +10: Detection threshold range, describing a dBu value.

#### 4.4.8. Setting the Analog Audio Detection Duration (A2 Version)

The DUR control sets the amount of time (in seconds) the audio is below the level set by the DET control before the audio is considered missing. The range of adjustment is 1 to 20 seconds, in one-second increments. Adjustment is completed using the card-edge interface or through *VistaLINK®* control.

CTRL
DUR
1 - 20

To change the *Audio Detection Duration*, select the CTRL menu item in menu level 1. Use the toggle switch to select the DUR menu item and press the pushbutton. The toggle switch may then be used to change the value. Select the desired value then press the pushbutton to apply the displayed selection and return to menu level 1. The following selections are available for this menu item:

1 to 20: Detection duration range in seconds.

#### 4.4.9. Selecting Identity Mode

The IDEN card edge menu item works in conjunction with the module ID card edge menu item for the purpose of audio soft switching on the 2408RGBR/DVIR modules. For audio soft switching, select ON under the IDEN card edge menu item.

CTRL
IDEN
ON
OFF

To configure the *Identity Mode*, select the CTRL menu item in the first menu level. Use the toggle switch to select the IDEN menu item and press the pushbutton. The toggle switch may then be used to change the value. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

ON: Enables module Identity for audio soft switching.

OFF: Disables module Identity.

#### 4.4.10. Setting the ID Tag

Router switches occur so rapidly that when a switch occurs, the cards do not detect a switch. An *ID Tag* is added to the audio data packet to allow detection of a switch. This triggers the soft switch circuit which prevents audio pops during a switch. The default ID is the product string serial number.

CTRL
ID
00000 to 7FFFE

To set the *ID Tag*, select the CTRL menu item in the first menu level. Use the toggle switch to select the ID menu item and press the pushbutton. The toggle switch may then be used to change the value. Press the pushbutton to apply the displayed selection and return to the first menu level. The following selections are available for this menu item:

**00000 to 7FFFE:** Each 2408RGBT/DVIT card must have a unique ID tag.

#### 4.4.11. Setting the Orientation of the Text on the Card Edge Display

The DISP option allows the user to set a horizontal or vertical orientation for the card edge display.

CTRL
DISP
HORZ
VERT

To set the *Display* orientation, select the CTRL menu item in the first menu level, then use the toggle switch to show the DISP menu selection and use the pushbutton to select it. Use the toggle switch to change between HORZ and VERT. Press the pushbutton to make your selection. The following selections are available for this menu item:

**HORZ** Horizontally displayed  
**VERT** Vertically displayed

#### 4.4.12. Displaying Input Signal Resolution

The *Signal Resolution* option displays the video resolution detected at the input (i.e. 1920x1200/60). The resolution option will also indicate if no resolution is detected. To display the input signal resolution, select the STAT menu item in the first menu level, then use the toggle switch to display the RES option and press the pushbutton to select it. The display will show NONE if no input signal is detected. If an input video signal is present, the display will show the detected resolution and refresh rate.

STAT
RES
(Detected Input Resolution)

The *Resolution* will be displayed similar to the following:

For example 1600X1200/60

#### 4.4.13. Displaying the RGB Output Video Sharpness (2408RGBT Models Only)

STAT
SHAR
0 to 31

This display shows the sharpness of the RGB video output at the 2408RGBR receiver.

0–31      Output RGB video sharpness

#### 4.4.14. Displaying the Selected Display Data Channel Mode (2408RGBT Models Only)

The 2408RGBT can display the selected display data channel mode. To indicate the selected display data channel mode, select the *STAT* menu item in menu level 1. Use the toggle switch to select the *DDC* menu item and press the pushbutton.

STAT
DDC
LCD
CRTA
CRTD

The display will show one of the following:

**LCD**    DDC set to emulate display with digital (DVI) input and output.  
**CRTA**   DDC set to emulate display with analog (RGB) input and analog (RGB) output.  
**CRTD**   DDC set to emulate display with analog (RGB) input and digital (DVI) output.

#### 4.4.15. Displaying the Video Input Sync (2408RGBT Models Only)

The 2408RGBT can display the type of sync signal that is present at the video input. To indicate the input sync type, select the *STAT* menu item in menu level 1. Use the toggle switch to select the *ISNC* menu item and press the pushbutton.

STAT
ISNC
SOG
HV

The *Video Input Sync* will indicate one of the following:

**SOG**    Sync signal at the RGBT input is Sync On Green  
**HV**      Sync signal at the RGBT input is RGB H and V

#### 4.4.16. Displaying the Selected Link Rate

The 2408RGBT/DVIT can display the *Active Link Rate*. To indicate the *Link Rate*, select the *STAT* menu item in menu level 1. Use the toggle switch to select the *LINK* menu item and press the pushbutton.

STAT
LINK
2970
3125

The *Link Rate* will show one of the following:

**2970**    Link Rate set to 2790Mb/s.  
**3125**    Link Rate set to 3125Mb/s.

#### 4.4.17. Displaying the Selected ID Tag

The 2408RGBT/DVIT can display the current *ID Tag*. To indicate the current *ID Tag*, select the *STAT* menu item in menu level 1. Use the toggle switch to select the *ID* menu item and press the pushbutton.

<i>STAT</i>
<i>ID</i>
<i>00000 to 7FFFFE</i>

The display will show one of the following:

*00000 to 7FFFFE* ID Tag

#### 4.4.18. Displaying the Firmware Version

The *VER* option displays the card's current firmware version. To display the firmware version, select the *STAT* menu item in the first menu level then use the toggle switch to display the *VER* option and press the pushbutton to select it. The firmware version will scroll across the display.

<i>STAT</i>
<i>VER</i>
<i>Firmware Version</i>

The firmware version will be displayed similar to the following:

For example: *VER 1.0 BLD 067*

## 5. JUMPER CONTROLS

Several jumpers (located at the front of the module) are used to preset various operating modes. Figure 4-4 shows the locations of the jumpers.

### 5.1. CONFIGURING THE MODULE FOR FIRMWARE UPGRADES

**RUN/UPGRADE:** The RUN/UPGRADE jumper is used when firmware upgrades are being done to the module. For normal operation it should be installed in the *RUN* position. See the *Upgrading Firmware* chapter in the front of the binder for more information.

To upgrade the firmware in the module unit pull it out of the frame. Move the RUN/UPGRADE jumper J16 into the *UPGRADE* position. Install the Upgrade cable provided (located in the vinyl pouch in the front of the binder) onto SERIAL header J7 at the card edge. Re-install the module into the frame. Run the upgrade as described in the *Upgrading Firmware* chapter in the front of the binder. Once the upgrade is completed, remove the module from the frame, move J16 into the *RUN* position, remove the upgrade cable and re-install the module. The module is now ready for normal operation.



## **6. VISTALINK<sup>®</sup> REMOTE MONITORING/CONTROL**

### **6.1. WHAT IS VISTALINK<sup>®</sup>?**

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

There are 3 components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VL-Fiber demo Manager graphical user interface (GUI), third party or custom manager software may be used to monitor and control Evertz VistaLINK<sup>®</sup> enabled fiber optic products.
2. Managed devices (such as 2408RGBT/DVIT cards), each with a unique address (OID), communicate with the NMS through an SNMP Agent. Evertz VistaLINK<sup>®</sup> enabled 7700 series modules reside in the 3RU 7700FR-C MultiFrame and communicate with the manager via the 7700FC VistaLINK<sup>®</sup> frame controller module, which serves as the Agent.
3. A virtual database, known as the Management information Base (MIB), lists all the variables being monitored, which both the Manager and Agent understand. Please contact Evertz for further information about obtaining a copy of the MIB for interfacing to a third party Manager/NMS.

For more information on connecting and configuring the VistaLINK<sup>®</sup> network, see the 7700FC Frame Controller chapter.

### **6.2. VISTALINK<sup>®</sup> MONITORED PARAMETERS**

The following parameters can be remotely monitored through the VistaLINK<sup>®</sup> interface. Note that some items may not be available depending on the type/options on the particular card.

<b>Parameter Name</b>	<b>Description</b>
<b>Input Video Resolution</b>	Input video resolution
<b>Card Type</b>	Card Type
<b>RGBR Optical Power</b>	Optical input power present at receiver
<b>Output Video Resolution</b>	Resolution of video output at the receiver
<b>RGBT Input Sync</b>	Input video sync type

**Table 6-1: VistaLINK<sup>®</sup> Monitored Parameters**

### 6.3. VISTALINK® CONTROLLED PARAMETERS

The following parameters can be remotely controlled through the VistaLINK® interface.

Parameter Name	Notes	Description
<b>Sharpness</b>	7708RGBT only when RGB video at input	Controls output video sharpness at 7708RGBR
<b>Detection</b>	-A2 versions	Audio detection level threshold
<b>Duration</b>	-A2 versions	Audio detection duration
<b>FTP Upgrade Destination</b>	RGBT RGBR	Selects whether this card or the connected receiver is the target of the FTP upgrade
<b>Laser</b>	0 = discontinuous 1 = continuous	Laser continuous or discontinuous mode
<b>Link Rate</b>	2970 3125	Sets Link Rate
<b>RGB Gain</b>	1.00 to 2.00	Sets RGB Gain
<b>ID Enable</b>	On Off	Sets Soft Switch
<b>ID Tag</b>	00000 to 7FFFE	Sets ID tag
<b>Receiver Video Output on Link Loss</b>	Black Suspend Off	Receiver video output mode on optical link loss
<b>Receiver Output video Control</b>	Normal Black Suspend Off	Control of video output on receiver – allows output of link video, black or DPMS modes
<b>RGBR Output Sync</b>	Auto SOG RGBHV	Controls sync type on RGB output
<b>V-Shift</b>	-10 to +10	Adjusts the vertical position of the output picture
<b>H-Shift</b>	-10 to +10	Adjusts the horizontal position of the output picture

**Table 6-2: VistaLINK® Controlled Parameters**

**6.4. VISTALINK<sup>®</sup> TRAPS**

The following traps can be *VistaLINK<sup>®</sup>* enabled and monitored.

Trap	Description
DVI Input	Triggers when valid DVI input is lost
RGB Input	Triggers when valid RGB input is lost
Laser	Triggers when Laser Fault is detected
Audio 1	Triggers when Audio 1 is lost
Audio 2	Triggers when Audio 2 is lost

**Table 6-3: VistaLINK<sup>®</sup> Traps**

*This page left intentionally blank*