

EMR-32x32-3G

EMR 12G/3G/HD Router

User Manual




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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 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, 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 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 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 POWER SUPPLY CORD PLUG FROM THE 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.

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	July 2019
1.1	Revised Section 2 and Section 4	April 2020
1.2	Updated information for serial port	July 2020
1.3	Added card edge information to section 2.3	November 2023

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1. OVERVIEW

EMR-32x32-3G is a 32-input by 32-output modular router designed to natively switch HD and 3G signals. It supports UHD signals as quad-link using deterministic routing. Single-link 12G UHD support can also be added as a feature key. A variety of different rear plates are available that provide connections via HDBNC, fiber or a combination of both.

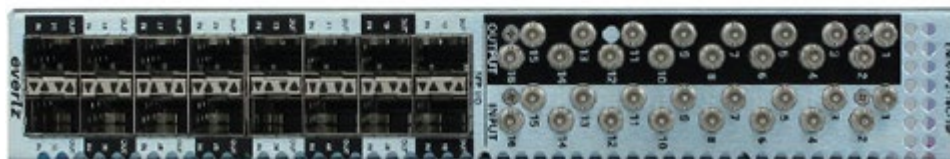
For maximum control flexibility, this router can be used in conjunction with Evertz[®] award-winning MAGNUM Unified Control System. Or, for smaller systems, the router can host a number of Evertz[®] control panel models over Ethernet.



EMR-RP2-32F



EMR-RP2-32C



EMR-RP2-16C-16F

Figure 1-1 : EMR-32x32-3G Rear Plate Options

Control

EMR-32x32-3G is housed in any of Evertz® standard EMX-6, EMX-3 or EMX-1 frames supporting dual-frame controllers, providing redundant control connections.

Remote Control Panel

Any traditional or simple Evertz® control panels can be used with EMR-32x32-3G while hosted either locally or through a control system.

External Third-Party Control

EMR-32x32-3G can be controlled remotely via external third-party control devices, such as an automated system.

Power Supply

EMR-32x32-3G is housed in Evertz® standard EMX-6, EMX-3 or EMX-1 frames, all of which support dual hot-swappable power supplies ensuring continuous operation.

Technical

EMR-32x32-3G offers full 3Gbps bandwidth. 12G support is also available as a feature key. Automatic bit rate detection on the input equalizer allows any mix of HD, 3G and 12G signals in the same unit.

Features & Benefits

- Designed with up to 12Gbps input EQs and output reclockers
- Full broadcast specifications
- Quartz over IP router control
- Redundant Ethernet network connections
- Redundant power
- Full VistaLINK® PRO Command & Control, SNMP
- Output up to 12G – reclocking on/off
- Rear plate support for HDBNC, SFP (fiber), or both

2. INSTALLATION

2.1. UNPACKING

Remove the equipment carefully from the box and look it over. Any error should be reported to your supplier immediately. Save all the packing material after unpacking the equipment as this could be useful in the future if it's needed to return the unit for maintenance.

Check each item supplied for transit damage. Any damage should be reported in detail to your supplier. You must state the serial number of the unit, which can be found on the rear of the frame. Check that power cords supplied are suitable for your country and the equipment is compatible with your main (line) voltage. Note that remote panels are mains powered and must also be checked.

2.2. PHYSICAL INSTALLATION

2.2.1. Router Frames

All units are designed for mounting in standard 19" equipment racks. The depth of the frame is 400mm. In addition, allowance must be made to accommodate the various cables and connectors which are to be installed at the rear of the frame.

2.2.2. Remote Panels

Ethernet remote panels are designed to fit into standard 19" equipment racks and can be mounted at any angle.

2.3. REAR PANEL CONNECTIONS

2.3.1. Card Edge

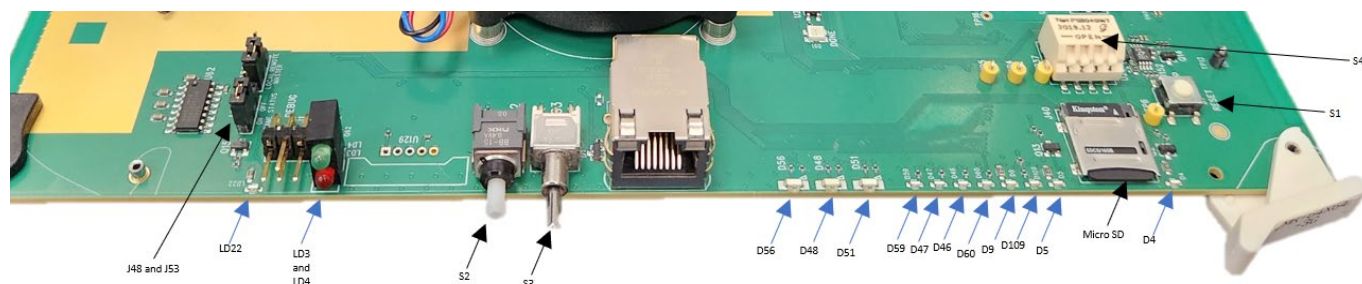


Figure 2-1 : EMR-32x32 Card Edge Top View

Name/PCB Label	Description
J48	'Frame Status' (On/Off) - When a jumper is fitted to the On position a Card error that triggers the Card Fault Red LED (LD 3/4) will also trigger the EMX Frame Status Fault (Solid Red LED on the EMX PSUs).
J53	'Master' (Local/Remote) - Factory use.
LD22	Local/Remote status
LD3 / LD4	Card Okay (Solid Green) / Card Fault (Solid Red). Note - Shows Red until EMR has booted up.
S2	Momentary Switch - Future Use.
S3	Toggle Switch - Future Use.
D56	Reference 1 (PAL) LED - Solid Green when PAL reference is detected. Orange to indicate incorrect reference.
D48	Reference 2 (NTSC) LED - Solid Green when NTSC reference is detected. Orange to indicate incorrect reference.
D51	Flashes Green and Orange ~1hz to indicate the main firmware app is running.
D59	Solid Orange to indicate network connection to External Audio or Tally Router.
D47	Solid Green when TDM Audio is detected on TDM Input 1.
D46	Solid Green when TDM Audio is detected on TDM Input 2.
D60	Future use.
D9	+3v3 rail
D109	+5v rail
D5	+1v2 rail
D4	+1v8 rail
Micro SD	Contains the EMR firmware.
S4	Dip Switch - Future Use.
S1	Reset Button - Reboots the EMR (hold down for 3 seconds).

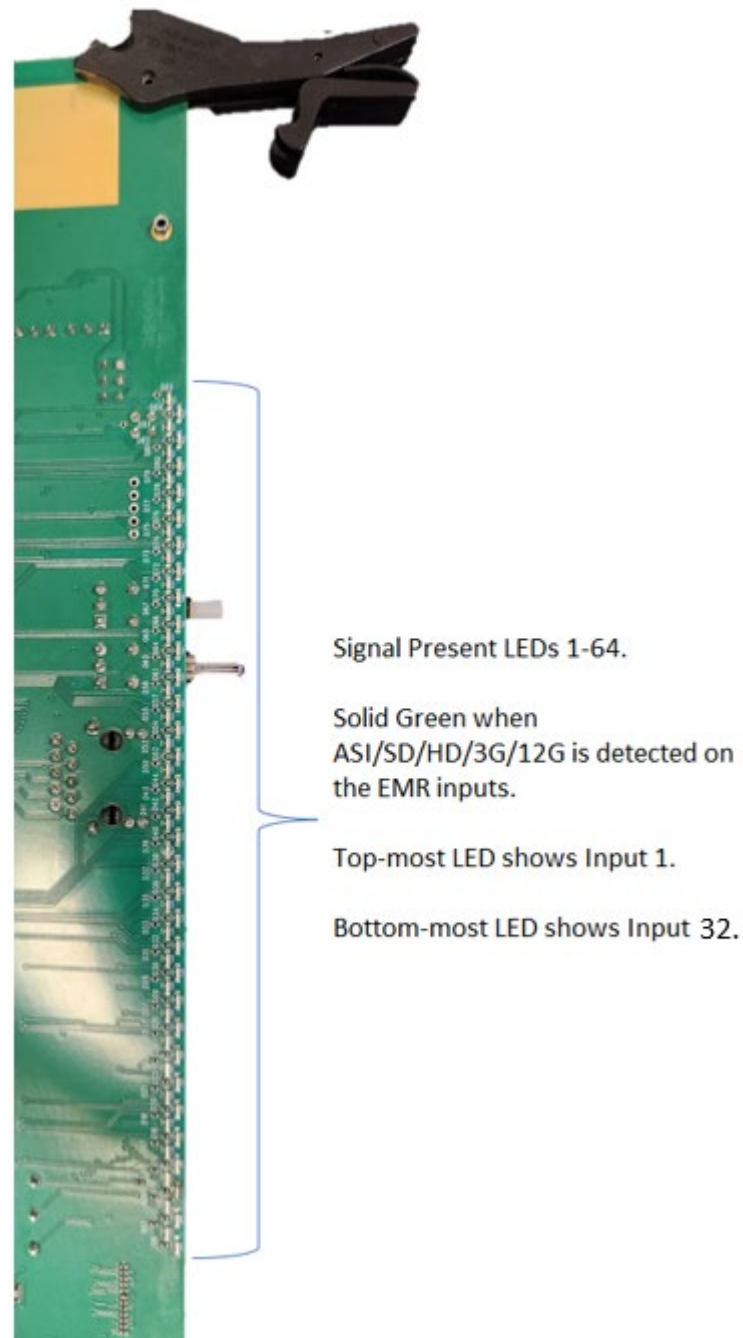


Figure 2-2 : EMR-32x32 Card Edge Bottom View

2.3.2. Video Inputs & Outputs

Coax connections are made using standard 75Ω video HDBNC connectors. A high quality coax cable such as Belden 4855R should be used for optimum performance. Fiber connections are based on the type of SFP used.



It is both important and good practice that cables are properly supported and not hanging from the connectors as this can put unnecessary stress on the connectors and possibly reduces their working life.

2.3.3. Serial Connections

The EMR single board video router can accept serial connection from the card edge as well as from the frame provided serial connection.

2.3.3.1. Card Edge Serial Connection

The card edge serial connection to the EMR-32x32-3G is located on the front edge of the card just below the top hinge. A WA-S76 serial adapter is needed for this connection.

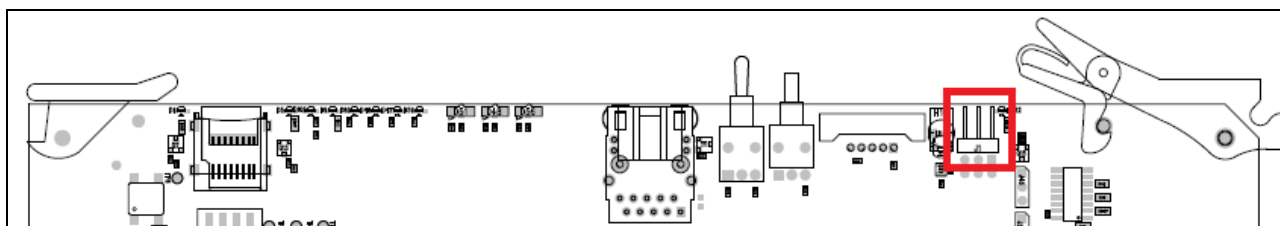


Figure 2-3 : EMR-32x32-3G Serial Connection

2.3.3.2. Rear Frame DB-15 Serial Connection

The serial connections on the rear of the EMX frame connect to the EMX-FC and will translate to IP for a TCP to a module within the frame. Use the below for serial port pinout:

RS-232 : DB9

pin9 (tx)
pin7 (rx)
pin5 (gnd)

RS-422 : DB9

pin5 (gnd)
pin6 (rx-)
pin7 (rx+)
pin8 (tx-)
pin9 (tx+)

2.3.4. Ethernet Connections

There are two RJ-45 network connectors on the rear of the EMX frame. The RJ-45 connectors are Ethernet ports used for monitoring and control of the system. See section 4.4.1 for information on connecting to an Ethernet network. See section 4.2.3 for information on configuring the network address of the router.

2.3.4.1. Connecting to an Ethernet Network

The EMR uses 10Base-T (10 Mbps), 100Base-TX (100 Mbps), or Gigabit (1 Gbps) twisted pair Ethernet cabling systems. When connecting for 10Base-T systems, category 3, 4, or 5 UTP cable as well as EIA/TIA – 568 100Ω STP cable may be used. When connecting for 100Base-TX systems, category 5 UTP cable is required. The cable must be 'straight-through' with an RJ-45 connector at each end. Establish the network connection by plugging one end of the cable into the RJ-45 receptacle of the EMX frame and the other end into a port of the supporting hub.

The straight-through RJ-45 cable can be purchased or can be constructed using the pin-out information in **Table 2-1**. A colour-coded wiring table is provided in Table 3 for the current RJ-45 standards (AT&T 258A or EIA/TIA 258B colour-coding shown). Also, refer to the notes following the table for additional wiring guide information.

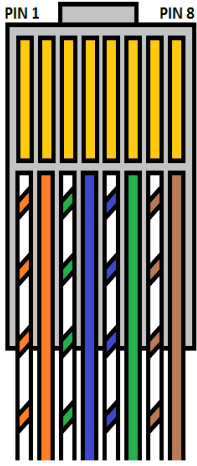
	Pin #	Signal	EIA/TIA 568A	AT&T 258A or EIA/TIA 568B	10Base-T or 100Base-T
	1	Tx+	White/Green	White/Orange	X
	2	Tx-	White or Green/White	Orange or Orange/White	X
	3	Rx+	White/Orange	White/Green	X
	4	N/A	Blue or Blue/White	Blue or Blue/White	Not used (required)
	5	N/A	White/Blue	White/Blue	Not used (required)
	6	Rx-	Orange or Orange/White	Green or Green/White	X
	7	N/A	White/Brown	White/Brown	Not used (required)
	8	N/A	Brown or Brown/White	Brown or Brown/White	Not used (required)

Table 2-1 : Standard RJ-45 Wiring Color Codes

Some cabling information for this wiring guide:

- Only two pairs of wires are used in the 8-pin RJ-45 connector to carry Ethernet signals
- Even though pins 4, 5, 7 and 8 are not used, it is mandatory they be present in the cable
- 10Base-T and 100Base-T use the same pins (a crossover cable made for one will also work with the other)
- Pairs may be solid colours and not have a stripe
- Category 5 cable must use Category 5 rated connectors

The maximum cable run between the router and the supporting hub is 300 feet (90 meters). The maximum combined cable run between any two end points (e.g. Router and PC/laptop via network hub) is 375 feet (205 meters).

Devices on the Ethernet network continually monitor the receive data path for activity as a means of checking that the link is working correctly. When the network is idle, the devices also send a link test signal to one another to verify link integrity. Each Ethernet connector on the rear panel is fitted with two LEDs to monitor the Ethernet connection.

10/100: This amber LED is ON when a 100Base-TX link is last detected. The LED is OFF when a 10Base-T link is last detected (the LINK LED is ON). Upon power-up the LED is OFF as the last detected rate is not known and therefore defaults to the 10Base-T state until rate detection is completed.

LN/ACT: This dual-purpose green LED indicates that the EMX-FC has established a valid linkage to its hub, and whether the EMX-FC is sending or receiving data. This LED will be ON when the EMX-FC has established a good link to its supporting hub. This gives you a good indication that the segment is wired correctly. The LED will be OFF if there is no valid connection.

2.3.5. Reference

2.3.5.1. Video Reference

There must be an analog reference present (NTSC or PAL) to ensure that the crosspoint changes occur during the field-blanking interval. If the reference is missing, then the routing will occur asynchronously. Looking at the back of the EMX frame, either PAL should be connected to the reference connector on the left-hand side of the frame; NTSC should be connected to the reference connector on the right-hand side of the frame, or both.

2.3.6. Power Supply

The EMR router power supplies operate on 100 to 240 volts AC at 50 or 60 Hz and automatically sense the input voltage. Power should be applied by connecting a 3-wire grounding type power supply cord to the power entry module on the rear panel. The power cord should be a minimum 18 AWG wire size; type SVT marked VW-1, maximum 2.5 meters in length.



CAUTION – TO REDUCE THE RISK OF ELECTRIC SHOCK, EARTHING OF THE EARTH PIN OF THE MAINS PLUGS MUST BE MAINTAINED



For NEBS-compliant installations, the AC power cords of the EMR Router shall be connected to an external surge protection device (SPD).

The power entry modules contain a standard IEC power inlet connector and an EMI line filter. A separate fuse holder is located inside the power supply module.

Fuse Rating:

EMR-32x32-3G Series: 6.3A, 250V ceramic time delay (5 x 20mm – 2 per power supply)

2.3.7. Grounding and Bonding-NEBS Applications



The NEBS-compliant version of this equipment is to be connected to a Common Bonding Network.

The primary grounding mechanism of the EMR router is through the Earth connector of the AC mains.



For NEBS-compliant installations, the AC power cords of the EMR Router shall be secured using retaining clips provided to ensure that proper grounding of the Earth pin of the AC mains plug is maintained.

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3. SPECIFICATION

3.1. SERIAL VIDEO INPUTS

Standard Single-link 4K-UHD (2SI), 3G, HD

3.2. SERIAL VIDEO OUTPUTS

Standard Same as input

3.3. SWITCHING REFERENCE

Reference Inputs 2 x BNC, analog 525/625

Signal Level: 1Vp-p \pm 3dB

Impedance 75 Ω

3.4. CONTROL

Ethernet 2 x RJ-45 10/100Base-T

Protocol Quartz

Serial Signal RS-232 / RS-422 (serial pin header)

3.5. PHYSICAL

Height 1.75" (45mm) – EMX-1

5.25" (133mm) – EMX-3

10.5" (266mm) – EMX-6

Width 19" (483mm) 19" Rack Mount

Depth 18.75" (477mm) over hinges and connectors – EMX-1

15.75" (400mm) over hinges and connectors – EMX-3/EMX-6

Weight Full: 22lbs (10kg) / Empty: 15lbs (6.8kg) – EMX-1

Full: 32lbs (14.5kg) / Empty: 17.4lbs (8kg) – EMX-3

Full: 64lbs (26kg) / Empty: 34.8lbs (16kg) – EMX-6

Operating Temperature 0°C to 40°C

Cooling Fan –cooled, front to back

3.6. ELECTRICAL

Input Voltage Auto-ranging 100-240V AC, 50/60Hz

Max Power Consumption 250W (125W per slot) – EMX-1
 450W (90W per slot) – EMX-3
 650W (400W per slot) – EMX-6

4. OPERATION

4.1. SYSTEM OVERVIEW

The EMR router is a matrix router that provides a simple, cost-effective solution for small router applications. The EMR-32x32-3G consists of 32 equalized inputs and 32 reclocked outputs. Each input and each output is interfaced through a common crosspoint that is controlled by the main processing unit.

The processing unit interfaces the various control options such as Ethernet and serial with the crosspoint, allowing full control of the routing resources. The processing unit also provides a video reference to the crosspoint to maintain SMPTE switching on the switch line.

4.2. SYSTEM CONFIGURATION

4.2.1. Setting the IP Address

When shipped from factory, the default IP address of the device is as follows:

Router Component (EMR): 192.168.245.17

To change the IP address of the components via Ethernet, follow the instructions below:

1. Telnet to port 23 of the EMR IP address
2. Log in using login/password combination **customer/customer**
3. Once the configuration menu is displayed, select the Network Setup menu
4. Follow the on-screen instructions to set the IP address, subnet mask, gateway, and broadcast address
5. Make sure to select the option to Save and Exit when changes are complete
6. Wait 30 seconds for changes to be saved
7. Reboot the EMR for changes to take effect

To change the IP address via Serial connection, follow the instructions below:

1. Connect a DB-9 cable with a WA-S76 serial adapter to the SERIAL pin header on the edge of the card
2. Set connection parameters as follows:
 - a. Baud rate: 115200
 - b. Data: 8 bit
 - c. Parity: none
 - d. Stop: 1 bit
 - e. Flow control: none
3. When prompted, log in with login/password combination **customer/customer**
4. Once the configuration menu is displayed, select the Network Setup menu
5. Follow the on-screen instructions to set the IP address, subnet mask, gateway, and broadcast address
6. Make sure to select the option to Save and Exit when changes are complete
7. Wait 30 seconds for changes to be saved
8. Reboot the EMR for changes to take effect



NOTE: The device must be rebooted in order for network changes to take effect.

4.2.2. Controlling the EMR Using Serial

The card edge of the EMR has a 4-pin serial connector as shown in Figure 2-1. The EMR supports Quartz protocol commands over this serial port (slave end) for testing purposes... The rear frame serial connection is designed for test and deployment of a serial connection for Quartz protocol, See section 2.3.2.2 for a description of the pin-outs of the serial port.

Quartz protocol is a open ASCII bases router protocol that provides unsolicited route updates and a number of router centric commands to control and get status. For information regarding Quartz protocol contact Evertz service for our Quartz protocol application document.

To configure the rear serial port connect the the EMX-FC, suggested methods are to use WA-S76 serial adapter or Telnet.

1. In the main menu of the EMX-FC select option 2 (Frame Configuration)
Then option 2 (serial to Ethernet Bridge config)
2. You will see this below pinout as seen in Figure 4-1, where you can enter the IP address of the EMR router you wish to connect to and the appropriate quartz TCP port you have opened on the router and the serial config to define if its RS-232 or RS-422. See section 2.3.2.2 for the appropriate serial connector pinout.

```
-----  
Remote IP: 192.168.10.201  
Remote Port: 4001  
Serial Config: RS-232  
-----  
(1) Set Remote Server IP Address  
(2) Set Remote Server Port  
(3) Set Serial Config  
(S) Save and Exit  
(X) Exit  
> x
```

Figure 4-1 : Serial to Ethernet Bridge Config

4.2.3. Accessing the Configuration and Monitoring Menu

The EMR router contains a configuration and monitoring menu that allows the user to change some internal settings of the device and also to monitor various components on the router. Before accessing the configuration and monitoring menu via Ethernet, the IP address of the device must be set.

The configuration and monitoring menu can be accessed using the Telnet network protocol or a Serial connection.

If there is a problem communicating over Ethernet, the user should check that there is a network connection to the router from a PC command prompt by typing *ping* followed by the IP address (example – *ping 192.168.245.17*). If there is no reply from the device using the *ping* command, check the network settings using the telnet/serial menu.

All menu items can be accessed using the number listed beside the menu item. Once in a menu, use the numbers beside the items to set the value. Follow the on-screen instructions to set the value of the parameter, and then save and exit the configuration.

When all desired changes have been made, exit the Telnet session by hitting CTRL+] or closing the Telnet session window.

Ethernet

The EMR uses port 23 as its default Telnet port which allows control and monitoring to be achieved from a PC using the Telnet function. Using a telnet client, Telnet into the configuration and monitoring menus of the device by typing *telnet* followed by the IP address of the EMR, and then followed by 23 (example – *telnet 192.168.245.17 23*).

Serial

Connect a serial cable and WA-S76 serial adapter between the PC and the SERIAL pin header on the EMR. Set connection parameters as follows:

- a. Baud rate: 115200
- b. Data: 8 bit
- c. Parity: none
- d. Stop: 1 bit
- e. Flow control: none

Use the login/password combination **customer/customer** to log in.

4.2.4. Configuration and Monitoring Menu

The following chart provides a brief description of the menus that are accessible through the configuration and monitoring option.

(1) <i>Network Setup</i>	Configuration of network settings
(2) <i>SNMP Setup</i>	Configuration of Simple Network Management Protocol settings
(3) <i>Engineering Debug Tool</i>	Debugging tool for Evertz support
(4) <i>Built In System Test</i>	Suite of self-tests
(5) <i>SYSLOG configuration</i>	Configure system logging

4.2.5. Configuring Network Settings

The *Network Setup* menus are used to configure parameters associated with the Ethernet communications of the device. The following chart provides a brief description of the items available in the *Network Setup* menu.

(1) <i>IP Address</i>	Sets the IP address of the device (Eth0)
(2) <i>Netmask</i>	Sets the subnet mask of the device
(3) <i>Gateway</i>	Sets the gateway of the device
(4) <i>Broadcast</i>	Sets the broadcast address of the device

4.2.6. SNMP Setup

The *SNMP Setup* menus are used to configure parameters associated with the SNMP communications of the device. The following chart provides a brief description of the items available in the *SNMP Setup* menu.

(1) <i>Select SNMP Get/Set Version</i>	Sets SNMP version as SNMPv1 or SNMPv3
(2) <i>Select SNMP Trap Version</i>	Sets SNMP trap version as SNMPv1 or SNMPv3
(3) <i>SNMP v1 Settings</i>	Submenu for configuring SNMPv1 settings
(4) <i>SNMP v3 Settings</i>	Submenu for configuring SNMPv3 settings

SNMPv1 Settings

(1) <i>Read Community String</i>	Sets SNMPv1 read community string (default: public)
(2) <i>Read/Write Community String</i>	Sets SNMPv1 read/write community string (default: private)
(3) <i>Trap Setup</i>	Submenu to add/remove/modify trap IP addresses

SNMPv3 Settings

(1) <i>SNMP v3 User Settings</i>	Submenu to add/remove/modify SNMPv3 users
(2) <i>SNMP v3 Trap Settings</i>	Submenu to add/remove/modify SNMPv3 trap addresses

4.2.7. Engineering Debug Tool

The Engineering Debug Tool is intended for debugging progress. It is intended for use by Evertz staff and should not be used under normal circumstances.

4.2.8. Built-In Self Test

The Built-in Self Test tool is used to test the functionality of various components on the device, such as memory and Ethernet adapters. It should not be used under normal circumstances. Running the tests in this tool may cause interruption to the device, requiring a reboot of the device to restore full functionality.

4.2.9. SYSLOG Configuration

The SYSLOG Configuration menu is used to set logging options for debugging purposes.

4.3. SIGNAL AND SYSTEM MONITORING

The EMR router supports signal monitoring of both inputs and outputs. It is also incorporates comprehensive system monitoring, including SFP data rates and interior temperatures.

Monitored data is available through VistaLINK[®] SNMP for facility-wide monitoring systems. System status may also be monitored remotely by accessing the device's webEASY web browser interface. User-configurable GPIO are also provided for connection to an external system.

4.4. CONTROL SYSTEM

The EMR router is fully compatible with all Evertz router control panels and interfaces, including connectivity to a comprehensive list of third-party control solutions.

The EMR router can be configured with the following control options: Ethernet or Serial. The following sections provide more details regarding these options.

4.4.1. Controlling the EMR using Ethernet

The EMR supports Evertz control panels that have an Ethernet connection. The EMR supports Quartz protocol commands over the Ethernet port. Therefore, any control device that supports Quartz protocol can control the EMR via Ethernet.



NOTE: Ethernet control access to the EMR is achieved via user-defined ports as explained in Section 6.1 .

Section 6.1.1 describes the method used to set up the EMR for use with Ethernet control panels. Consult the instruction manual for the respective panels for information regarding their IP address setup.

4.4.2. Controlling the EMR using Serial

The EMR supports Quartz protocol commands over the serial port (slave end). Any control device that supports Quartz protocol can control the EMR via the serial port on the rear of the frame.

For information regarding the Quartz protocol, contact Evertz service. See section 2.3.2 for a description of the pin-outs of the serial port.

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5. VISTALINK® REMOTE MONITORING AND CONTROL

5.1. WHAT'S VISTALINK®?

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

There are three components of SNMP:

1. An SNMP manager, also known as a Network Management System (NMS), is a computer running special software that communicates with the devices in the network. Evertz VistaLINK® Pro Manager graphical user interface (GUI), third-party, or custom manager software may be used to monitor and control Evertz VistaLINK® enabled products.
2. Managed devices (such as EMR), each with a unique address, communicate with the NMS through an SNMP 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 or NMS.

5.2. GENERAL MONITORING AND CONTROL PARAMETERS

5.2.1. System

The screenshot displays the 'System' configuration page for the EMR-64X64-12G device. The page is titled '172.20.123.202, EMR-64X64-12G: Configuration' and includes a status bar at the top with 'Full Refresh', '1.0 Apply', and 'Status Completed (12:34:35 2019-04-15)'. The 'System' tab is selected, showing the following sections:

- Product:** Product Name (EMR-32x32-3G), Serial Number (7851690003), Revision (1.01), Build (0204).
- Control Port:** MAC Address (00:02:c5:27:4f:70), IP Address (172.20.123.202), Netmask (255.255.255.0), Gateway (172.20.123.1).
- References:** A table with Reference Status and Reference Standard columns.
- Temperature:** A table showing the status of various sensors.
- System Control:** A 'Reboot' button.

Reference Status	Reference Standard
Ref 1: None	Unknown
Ref 2: None	Unknown

	Status
Sensor Below FPGA	Green
Sensor Above FPGA	Green
Crosspoint	Green
FPGA	Green

Figure 5-1 : VistaLINK® - System

Product

Product Name: Displays the name of the product

Serial Number: Displays the serial number of the product

Revision: Displays the firmware revision currently running

Build: Displays the firmware build currently running

Control Port 1

MAC Address: Displays the MAC address of the product

IP Address: Sets and displays the IP Address of the product

Netmask: Sets and displays the subnet mask of the product

Gateway: Sets and displays the gateway of the product

References

Reference Status: Displays the current status of the reference input (present/none)

Reference Standard: Displays the current standard of the reference input (NTSC/PAL)

Temperature

Sensor below FPGA: Displays the temperature status of the sensor below the FPGA

Sensor above FPGA: Displays the temperature status of the sensor above the FPGA

Crosspoint: Displays the temperature status of the crosspoint

FPGA: Displays the temperature status of the FPGA

System Control

Reboot: This section allows the user to reboot the device

5.2.2. Product Features

172.20.123.202, EMR-64X64-12G: Configuration

Full Refresh 1.0 Apply Status Completed (12:34:35 2019-04-15) Logger

System **Product Features** Configuration Signal Status Audio Status Notify TRAP Config

Product License

Product License File Choose File No file chosen. Upload

Product Serial Number 7851690003

Product Mac Address 00:02:c5:27:4f:70

Product License

Prod Features Supported

Varid ☒ 1 ☐ 2

Varid 1

Prod Feature Name 12G

Prod Feature Supported Disabled

Figure 5-2 : VistaLINK® - Product Features

Product License

Product License File: Allows user to select and upload a license key file

Product Serial Number: Displays the serial number of the product

Product MAC Address: Displays the MAC address of the product

Prod Features Supported

Prod Feature Name: Displays the name of the selected feature

Prod Feature Supported: Displays whether the selected feature is enabled

5.2.3. Configuration

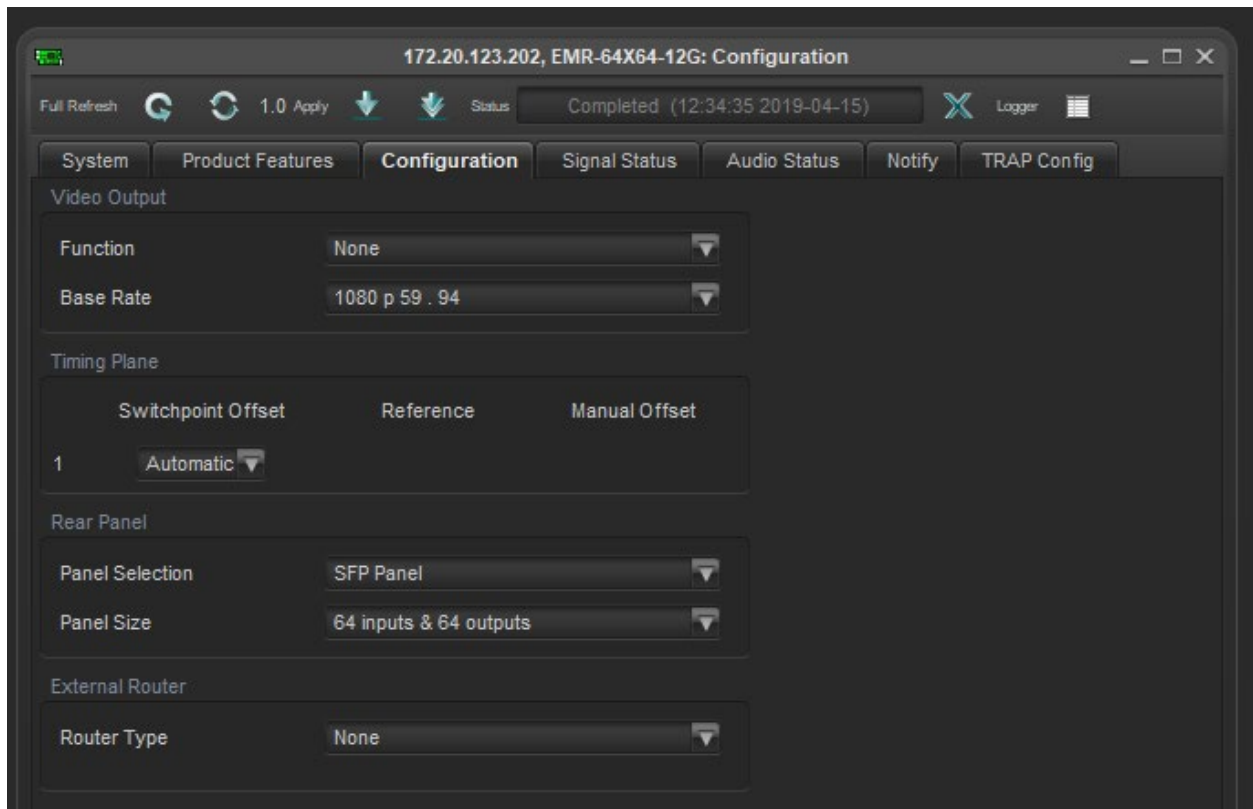


Figure 5-3 : VistaLINK® - General

Video Output

Function: Sets and displays product's optional functions (Clean Switch, audio embed and de-embed)

Base Rate: Sets and displays the base rate of the input signal

Timing Plane

Switchpoint Offset: Sets manual switch line offset (Automatic mode is recommended)

Rear Panel

Panel Selection: Sets and displays the type of rear plate in use

Panel Size: Sets and displays the matrix size of the product

External Router

Router Type: This field allows the user to set the router type

5.2.4. Signal Status

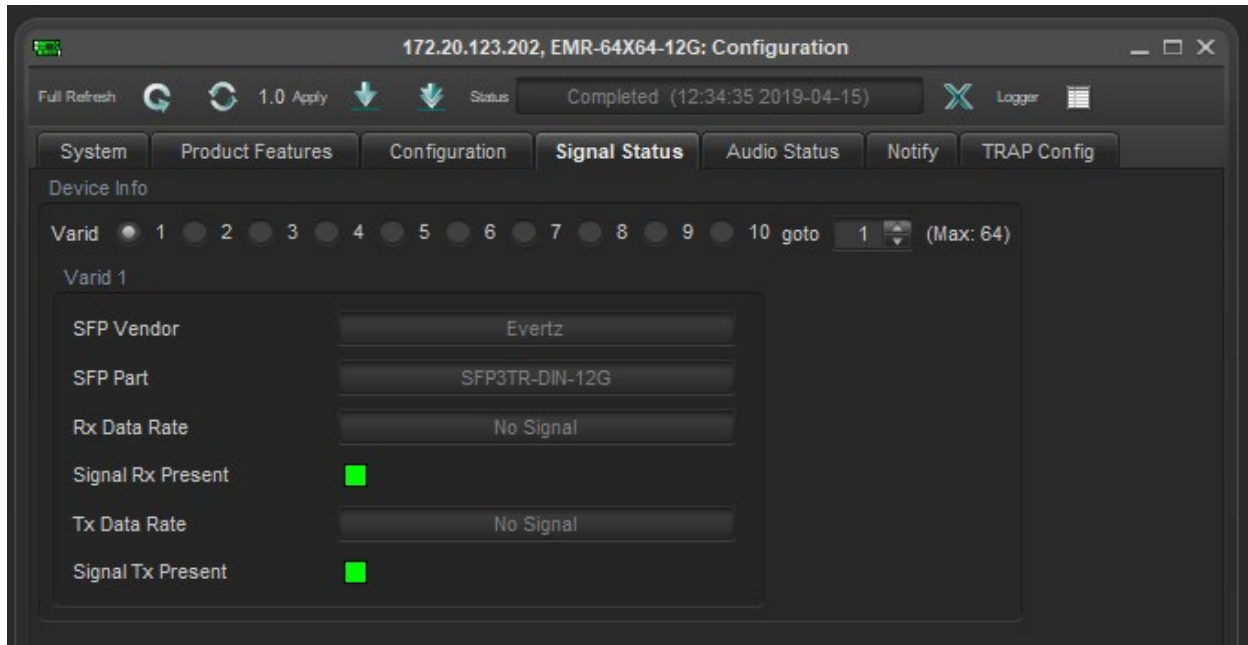


Figure 5-4 : VistaLINK® - SFP

Device Info

Varid: Selects the port to examine

SFP Vendor: Displays the SFP vendor name

SFP Part: Displays the SFP part name/number

Rx Data Rate: Displays the incoming signal data rate

Signal Rx Present: Displays the incoming signal presence

Tx Data Rate: Displays the outgoing signal data rate

Signal Tx Present: Displays the outgoing signal presence

5.2.5. Audio Status

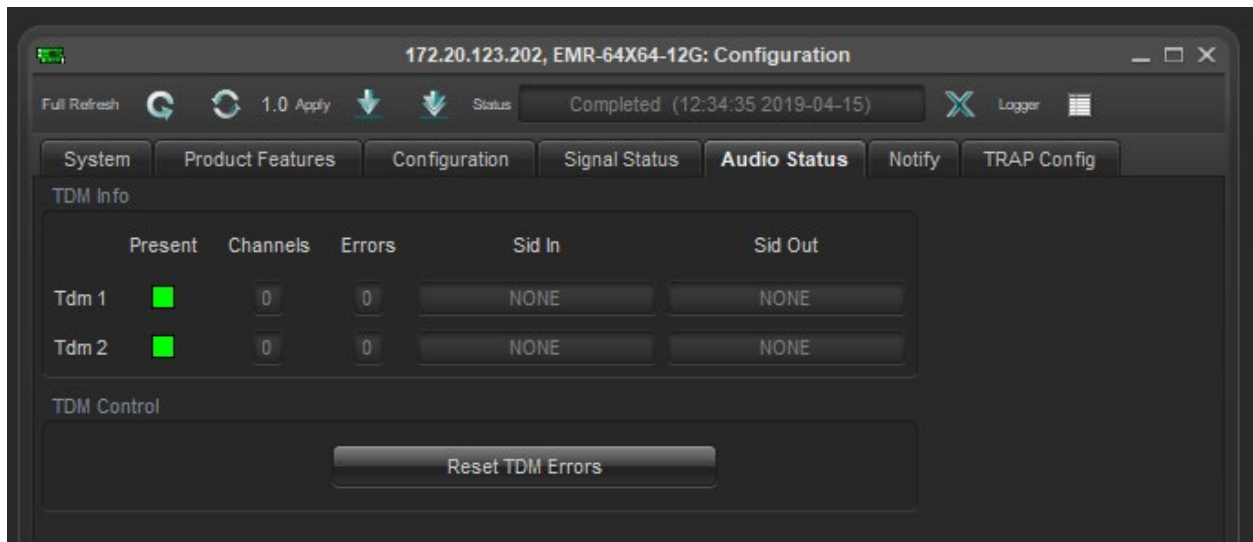


Figure 5-5 : Figure 5-5: VistaLink® - Audio Status (future implementation)

TDM Info

Present: Displays TDM link presence status

Channels: Displays number of TDM channels on the link

Errors: Displays the number of TDM errors on the link

Sid In: Displays the signal ID of the connected device

Sid Out: Displays the signal ID being sent to the connected device

TDM Control

Reset TDM Errors: Resets TDM error counters (future implementation)

5.2.6. Notify

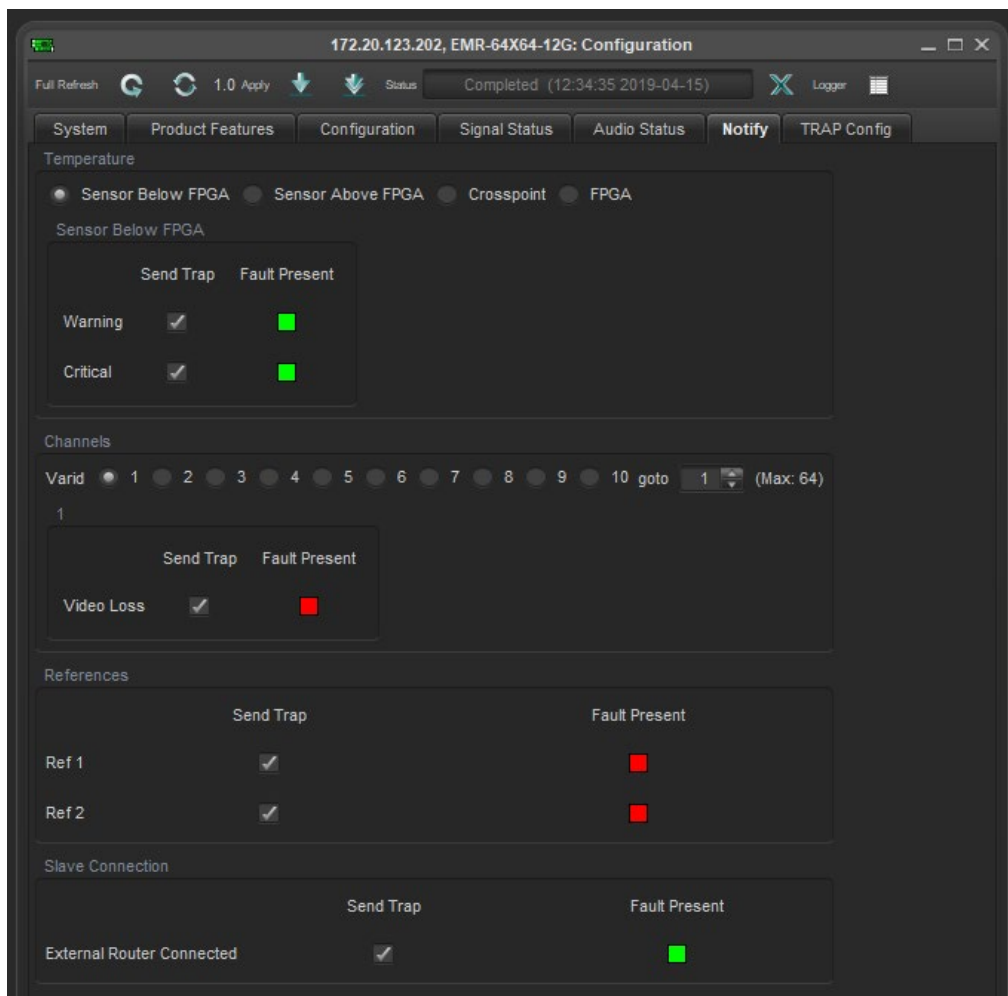


Figure 5-6 : VistaLINK® - Notify

Temperature

Warning: Send trap if temperature crosses warning threshold

Critical: Send trap if temperature crosses critical threshold

Channels

Video Loss: Send trap if loss of signal is detected

References

Ref #: Send trap if loss of reference is detected

Slave Connection

External Router Connected: Send trap if external slave device disconnect is detected

5.2.7. TRAP Config

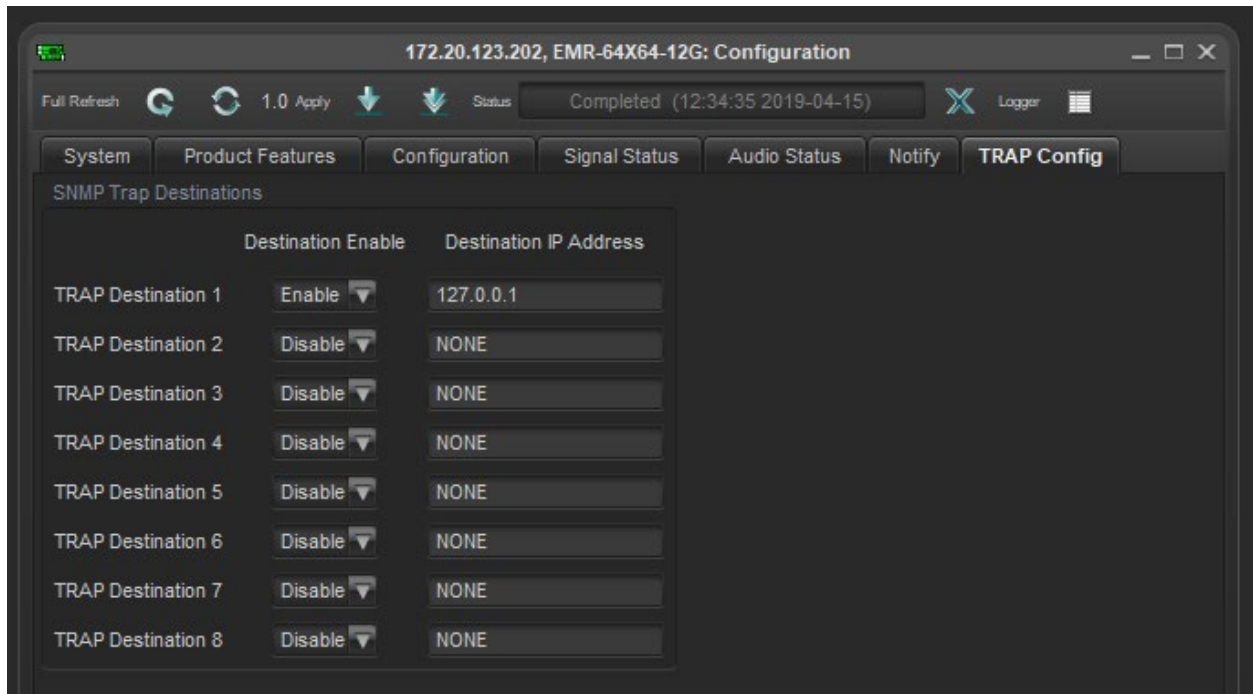


Figure 5-7 : VistaLINK® - TRAP Config

SNMP Trap Destinations

Destination Enable: Enable or disable the sending of SNMP traps to the IP address indicated

Destination IP Address: Sets and displays SNMP trap target IP addresses

5.2.8. Manage Routes

In order to access the Manage Routes section, right click on the device and select Manage Route. Once the section is opened, the source and destination can be set.

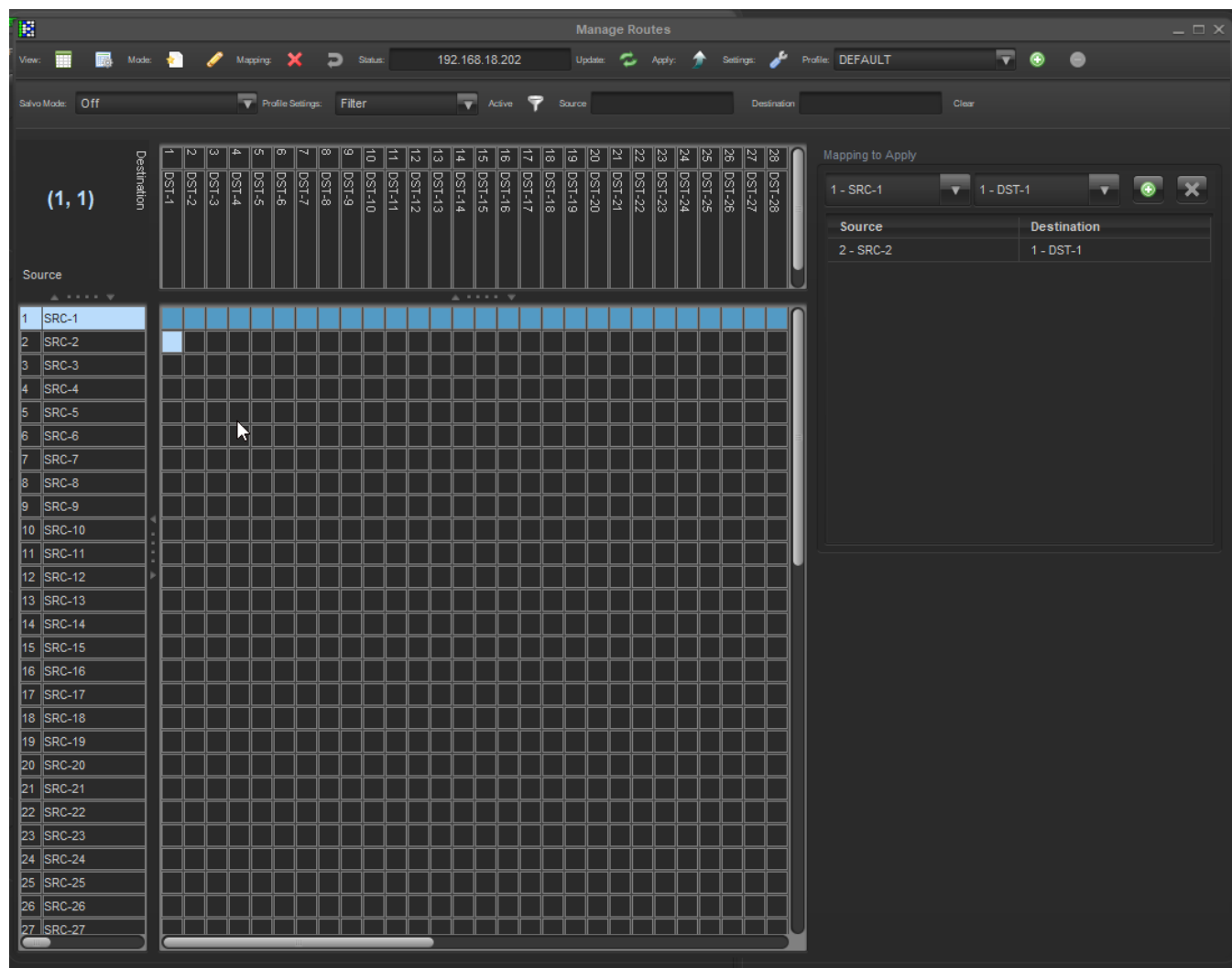


Figure 5-8 : VistaLINK® - Manage Routes

Source and Destination's Map: This grid style map can be used to set routes by matching a source to a destination inside the grid.

6. CONFIGURING THE SYSTEM USING WINSETUP

The WinSetup program is used to configure most of the routing functions, including control panel operation. It allows such things as the number of signal levels to be defined, which control panels are connected to the system, and the names of inputs and outputs.

The configuration of the EMR uses a special version of WinSetup. To ensure that the correct version is used, check the *Options > System Version* menu. The correct version has the SC-500E as the only system inside the Routing System Controller box.



NOTE: Configuration of the EMR requires a specific version of WinSetup.

WinSetup is supplied with a comprehensive help system that can be accessed by pressing **F1** from any screen. The help system can also be entered from the *Help > Index* menu. The following notes are a very brief guide to getting started with WinSetup.

The following dialog box is the WinSetup main screen. Any part of the system can be configured from the menu at the top of the screen. The grey bars above each main section and the line items within the main sections can both be used for quick access to specific items.

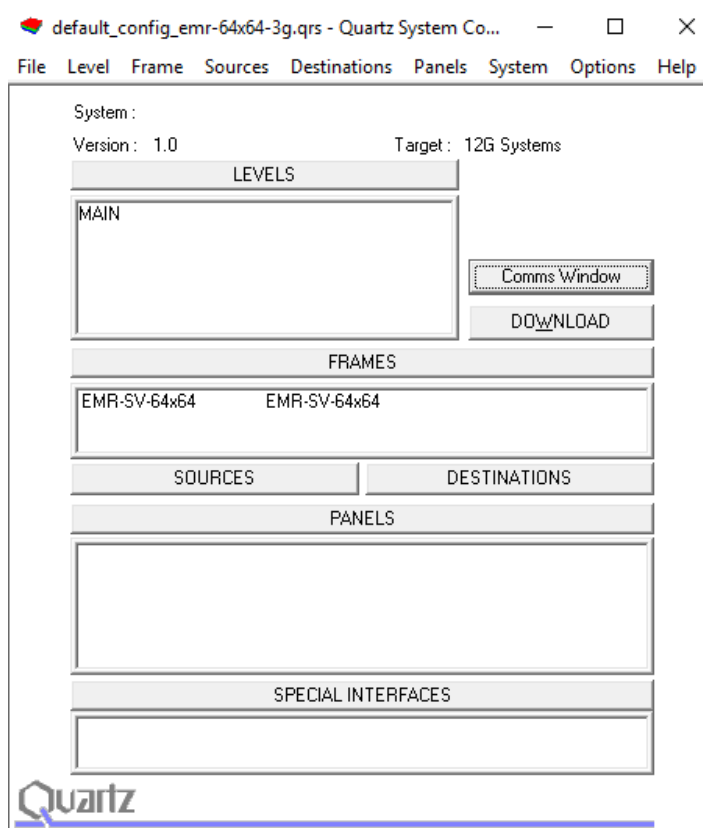


Figure 6-1 : WinSetup Configuration Editor

When generating a new system configuration, some of the menus and functions are grayed out (not available). This is deliberate to lead the user through the functions that need to be set up. Carry out the following functions to configure the system.

1. **Levels:** Enter the level names for each of the signal levels that you want to control. Do not tick the 'Complex' box at this stage.
2. **Frames:** Enter the frames dialog and use the **New** button. Select the appropriate router from the list available. The only change that needs to be made in the **Edit Frame** dialog is the **Q-LINK** address. This address must be unique among all devices in the system.

Edit Frame

Main | EMR General | EMR Slots | Port Setup | Device Binding

Part Number: EMR-SV-64x64 Frame Type: 61 Q-Link: 0 Hex.

Name: EMR-SV-64x64

Description: 64x64 12G Video

Frame Configuration

Sub-divide Frame: No

Automatic Settings: ☒

Physical Frame

Level	Name	Input Size	Output Size	Input Min.	Input Max.	Output Min.	Output Max.
Video		64	64	1	64	1	64

Control System

Control Level	Source Min.	Source Max.	Destination Min.	Destination Max.
MAIN	1	64	1	64

OK Cancel Apply Help

Figure 6-2 : WinSetup Frame Editor

3. **Sources:** Enter the sources dialog and use the add button to fill the name table with SRC-1 to SRC-X. The names can be edited later when a few panels are configured and working properly.

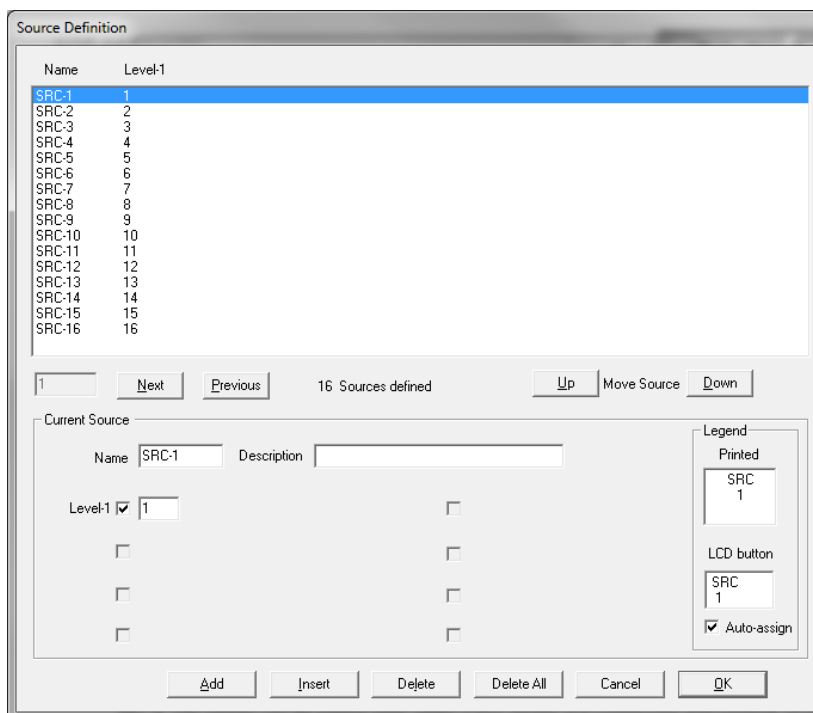


Figure 6-3 : WinSetup Source Definition

- Destinations:** Enter the destination dialog and set up the destination names in the same way as used for the source names.

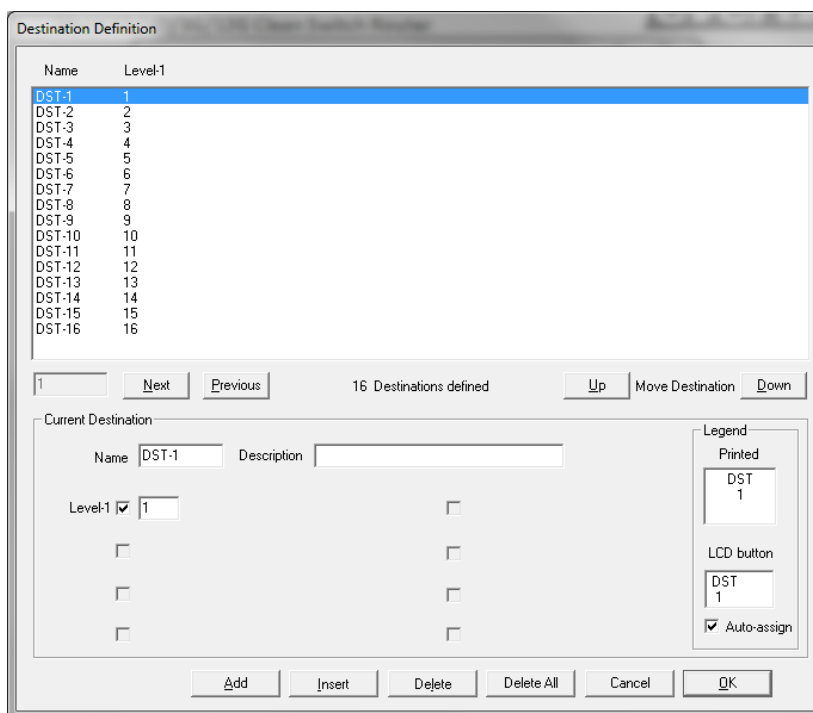


Figure 6-4 : WinSetup Destination Definition

5. **Panels:** Enter the panel's dialog and use the **New** button; this will show all Evertz panels listed by part number. Select the part number that matches the part number on the panel's serial number label. Ignore the A/E designation as the connection method for the panel that will be defined in the panel configuration dialog. Once a part number is selected, a new dialog box will appear displaying a graphic of the panel. Figure 6-5 shows the button display for the CP-2402E control panel.

Figure 6-5 : WinSetup Panel Configuration

Each button can be programmed by selecting the button and then editing the functions in the Key section of the dialog box. Each panel should also be given a name for later identification; *Panel 2402* is used in this example. The Q-LINK address will be allocated automatically by the program but can be edited if required. The default parameters control how the panel will function at power up. In this example the panel will always control DST-1 to start with. Now add any further panels that the system will need.



NOTE: The checkbox for 'Use Ethernet' must be checked to control the panel over the Ethernet network.

6. **Download:** Click the **Download** button on the main screen (or, alternately, use *System > Download to router*) to transfer the setup data to the router.



NOTE: The configuration for the EMR can only be downloaded over Ethernet and not serially.



NOTE: Configuration downloads to the EMR must be performed using port 2500.

6.1. COMMUNICATION PORT SETUP

The EMR has several communication ports that require additional setup. This section is used to define all of the interfaces that will be connected to the EMR. Enter the *Edit Frame* dialog and select the *Port Setup* section.

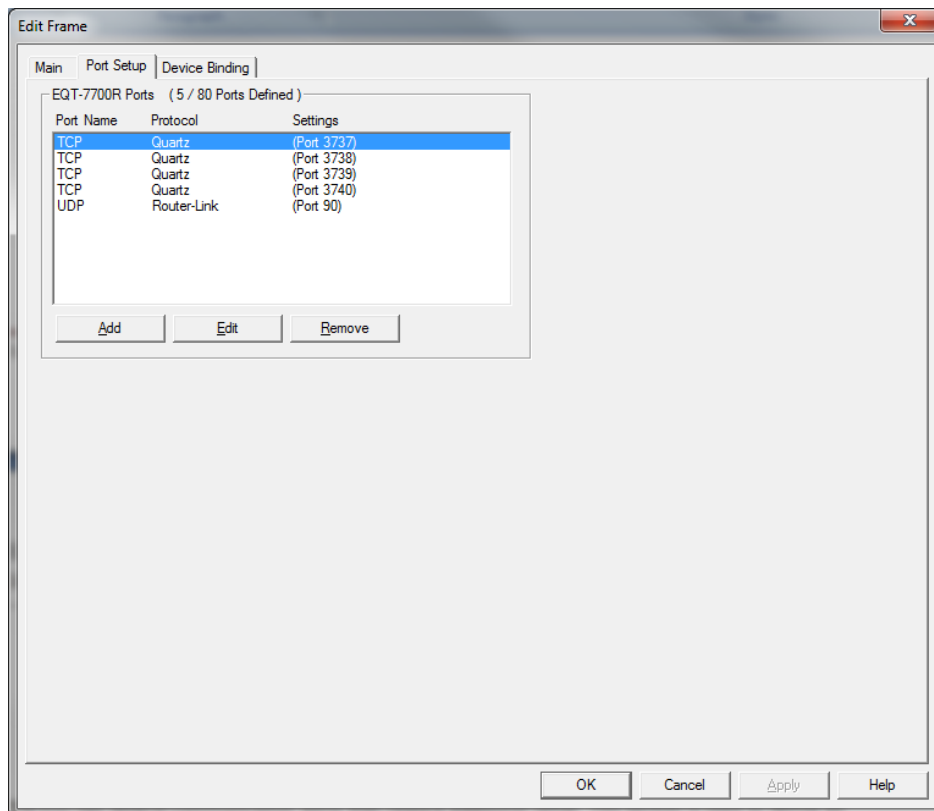


Figure 6-6 : Port Setup

6.1.1. Control Panel Ethernet Interface

The control panel Ethernet port is a single interface that is defined to allow all properly equipped control panels to connect to the EMR via Ethernet. The interface is designed as a *UDP* interface using the *RouterLink* protocol. The port is always defined as *90*. A properly configured setting is shown in Figure 6-7.

Port Settings

General

Interface: UDP Port: 90

Protocol: Router-Link

Advanced

Source Offset: 0 Controlling Protocol: ☐

Dest. Offset: 0 Controlling Levels: VABCDEFG

Valid Start: 1 Use updates as takes: ☐

Valid Stop: 2048

Valid Levels: VABCDEFG

☐ Periodic Poll 1000 ms

☐ Periodic Interrogate 1000 ms

☐ Interrogate routes on connection/startup

Ok Cancel Default

Figure 6-7 : Ethernet Panels – Port Settings

6.1.2. Ethernet Interface

The Ethernet interface is defined to provide access to the EMR so that it can be controlled via Ethernet using Quartz protocol. Up to four control ports can be added: 3737, 3738, 3739, and 3740. These ports can be defined multiple times to allow for multiple simultaneous connections per port from different devices. An example of a properly configured Ethernet port for external control is shown in Figure 6-8.

Port Settings

General

Interface: TCP Port: 3737

Protocol: Quartz

☐ is client

Advanced

Source Offset: 0 Controlling Protocol: ☐

Dest. Offset: 0 Controlling Levels: VABCDEFG

Valid Start: 1 Use updates as takes: ☐

Valid Stop: 2048

Valid Levels: VABCDEFG

☐ Periodic Poll 1000 ms

☐ Periodic Interrogate 1000 ms

☐ Interrogate routes on connection/startup

Default

Ok Cancel

Figure 6-8 : Ethernet Port Settings

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7. FIRMWARE UPGRADE

Upgrading the EMR is done using a standard web browser on any computer that is connected to the same network. The following sections detail methods for upgrading the firmware on the EMR-32x32-3G.

Firmware baseline is version V101B20181126-0151. Please contact the factory for upgrade instructions if below this baseline.

7.1. UPGRADING EMR

The following steps are used to upgrade the EMR-32x32-3G.

Using a standard web browser on the same network as the EMR (Mozilla Firefox is strongly recommended), browse to the IP address of the EMR. You will be prompted to enter a username and password; use the login/password combination root/evertz. After logging in, click on **Upgrade** which is located at the top of the page as seen in Figure 7-1.



Figure 7-1 : WebEASY® - Upgrade Button on Top Menu Bar

Selecting the Upgrade tab will take the user to Figure 7-2 where the current firmware version is shown. The user needs to download the firmware image file with an *.img* file extension if the firmware version is outdated. Once a file has been selected, click the **Upgrade** button as shown in Figure 7-2.

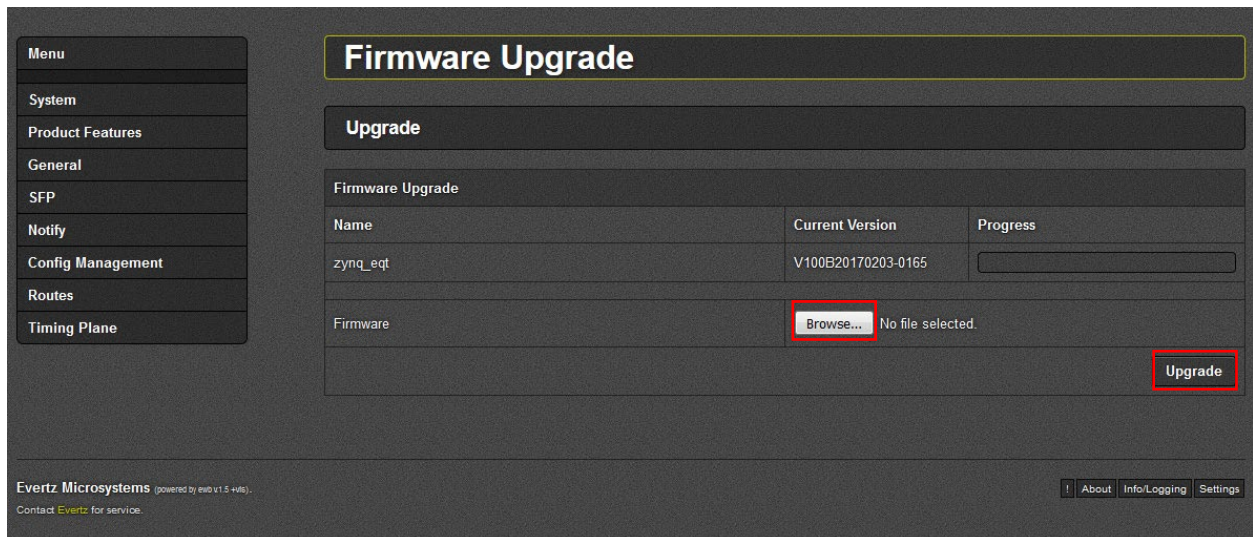


Figure 7-2 : WebEASY® - Firmware Upgrade Menu

After pressing the upgrade button, the file will be uploaded and the EMR will be upgraded. Once completed, a message indicating that the upgrade has completed will be displayed in the progress bar. The EMR will then automatically reboot itself to apply the upgrade.

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8. DEFINITIONS

4:2:2:	The sampling ration used in the HDTV digital video signal. For every 4 samples of luminance, there are 2 samples each of R-Y (red minus luminance) and B-Y (blue minus luminance).
16x9:	A wide-screen television format such as HDTV in which the aspect ratio of the screen is 16 units wide by 9 units high as opposed to the 4x3 aspect ratio of traditional SD television.
AES/EBU:	Sometimes abbreviated as AES. Refers to the digital audio standard (AES3-1992) set by the Audio Engineering Society and European Broadcast Union and used by most forms of digital audio from CDs to professional digital video.
ASPECT RATIO:	The ratio of width to height in a picture. Theatre screens generally have an aspect ratio of 1.85 to 1, widescreen TV (16x9) is 1.77 to 1, and traditional SD TV (4x3) is 1.33 to 1.
CCIR:	Abbreviation for International Radio Consultative Committee, an international standards committee. This organization is now known as ITU.
CCIR-601:	See ITU-R601.
CLIFF EFFECT:	Also referred to as the 'digital cliff.' This is a phenomenon found in digital video systems that describes the sudden deterioration of picture quality when due to excessive bit errors, often caused by excessive cable lengths. The digital signal will be perfect even though one of its signal parameters is approaching or passing the specified limits. At a given moment however, the parameter will reach a point where the data can no longer be interpreted correctly, and the picture will be totally unrecognizable.
COMPONENT ANALOG:	The non-encoded output of a camera, video tape recorder, etc., consisting of the three primary colour signals: red, green, and blue (RGB) that together convey all necessary picture information. In some component video formats these three components have been translated into a luminance signal and two colour difference signals, for example Y, B-Y, R-Y.
COMPONENT DIGITAL:	A digital representation of a component analog signal set, most often Y, B-Y, R-Y. The encoding parameters are specified by ITU-R709 for HDTV signals. SMPTE 274M and SMPTE 296M specify the parallel interface.
COMPOSITE ANALOG:	An encoded video signal such as NTSC or PAL video that includes horizontal and vertical synchronizing information.
COMPOSITE DIGITAL:	A digitally encoded video signal, such as NTSC or PAL video that includes horizontal and vertical synchronizing information.

DROP FRAME:	In NTSC systems, where the frame rate is 29.97002618 frames per second, the drop frame mode permits time of day indexing of the frame numbers by dropping certain frame numbers. Specifically frames 0, and 1 at the beginning of each minute except minutes 0, 10, 20, 30, 40, and 50, are omitted, to compensate for an approximate timing error of 108 frames (3 seconds 18 frames) per hour. A flag bit is set in the time code to signal when the drop frame mode is in effect.
EBU:	Abbreviation for European Broadcast Union, an organization of European broadcasters that among other activities provides technical recommendations for the 625/50 line television systems.
EMBEDDED AUDIO:	Digital audio is multiplexed onto a serial digital video data stream.
ITU:	The United Nations regulatory body governing all forms of communications. ITU-R (previously CCIR) regulates the radio frequency spectrum, while ITU-T (previously CCITT) deals with the telecommunications standards.
ITU-R601:	An international standard for standard definition component digital television from which was derived SMPTE 125M and EBU 3246-E standards. ITU-R601 defines the sampling systems, matrix values and filter characteristics for Y, B-Y, R-Y and RGB component digital television signals.
NTSC:	The National Television Standards Committee established the television and video standard in use in the United States, Canada, Japan, and several other countries. NTSC video consists of 525 horizontal lines at a field rate of approximately 60 fields per second (Note – two fields is equal to one complete frame). Only 487 of these lines are used for picture. The rest are used for sync or extra information such as VITC and Closed Captioning.
PAL:	Abbreviation for Phase Alternating Line, the television and video standard in use in most of Europe. It consists of 625 horizontal lines at a field rate of 50 fields per second (Note – two fields is equal to one complete frame). Only 576 of these lines are used for picture. The rest are used for sync or extra information such as VITC and Teletext.
PIXEL:	The smallest distinguishable and resolvable area in a video image. A single point on the screen. In digital video, a single sample of the picture. Derived from the words <i>picture element</i> .
SMPTE:	Abbreviation for Society of Motion Picture and Television Engineers, a professional organization that recommends standards for the film and television industries.
SMPTE 12M:	The SMPTE standard for time and address code. SMPTE 12M defines the parameters required for both linear and vertical interval time codes.

SMPTE 125M:	The SMPTE standard for bit parallel digital interface for component video signals. SMPTE 125M defines the parameters required to generate and distribute component video signals on a parallel interface.
SMPTE 259M-C:	The SMPTE standard for 525- and 625-line serial digital component and composite interfaces.
SMPTE 272M:	The SMPTE standard for embedding audio in serial digital standard definition (SMPTE 259M-C) video signals.
SMPTE 274M:	The SMPTE standard for bit parallel digital interface for high definition component video signals with an active picture of 1080 lines x 1920 pixels.
SMPTE 276M:	The SMPTE standard for transmission of AES/EBU digital audio signals over coaxial cable.
SMPTE 292M:	The SMPTE standard for high definition serial digital component interfaces.
SMPTE 296M:	The SMPTE standard for bit parallel digital interface for high definition component video signals with an active picture of 720 lines x 1280 pixels.
SMPTE 299M:	The SMPTE standard for embedding audio in serial digital high definition (SMPTE 292M) video signals.
TRS:	Abbreviation for Timing Reference Signals used in composite digital signals. It is four digital words long.
TRS-ID:	Abbreviation for Timing Reference Signal Identification, a reference signal used to maintain timing in composite digital systems. It is four digital words long.

End of document