7800MDM-12G
12G to/from Quad-Link 3G Bi-Directional Converter for UHD Signals

User Manual

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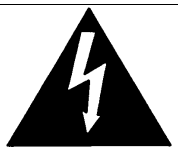
IMPORTANT SAFETY INSTRUCTIONS

	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 these instructions
- 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

CISPR 22 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 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.

CE

EN60065	Safety
EN55103-1: 1996	Emission
EN55103-2: 1996	Immunity

EN504192 2005
Waste electrical products should not be disposed of with household waste.
Contact your Local Authority for recycling advice

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.

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Tables

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Mar 2017
1.1	Removed 425M Level B References	Nov 2017

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1. OVERVIEW

The 7800MDM-12G is a bi-directional multiplexer/demultiplexer for converting UHD signals between quad-link 3G and 12G SDI. It bridges the gap between quad-link and native 12G equipment in UHD infrastructures.

Features & Benefits

- Converts between 12G (SMPTE ST 2082) SDI and Quad-Link 3G SDI
- Bi-Directional – a single card can be used to wrap a device with both inputs and outputs
- Modular and front accessible – can be hot-swapped without de-cabling
- High Density – bi-directional conversion on a single-slot card
- Dual 12G input (software selectable as to source) and dual 12G outputs for signal distribution when equipped with optional second input SFP
- VistaLINK capable for remote monitoring, control and configuration capabilities via SNMP using VistaLINK PRO, CP-2116E or CP-2232E Control Panels. VistaLINK is available when modules are used with the 7800FR or 7801FR with 7800/7801FC frame controller installed.
- Web GUI for remote monitoring, control and configuration capabilities when modules are used with the 7800FR or 7801FR with 7800/7801FC frame controller installed.

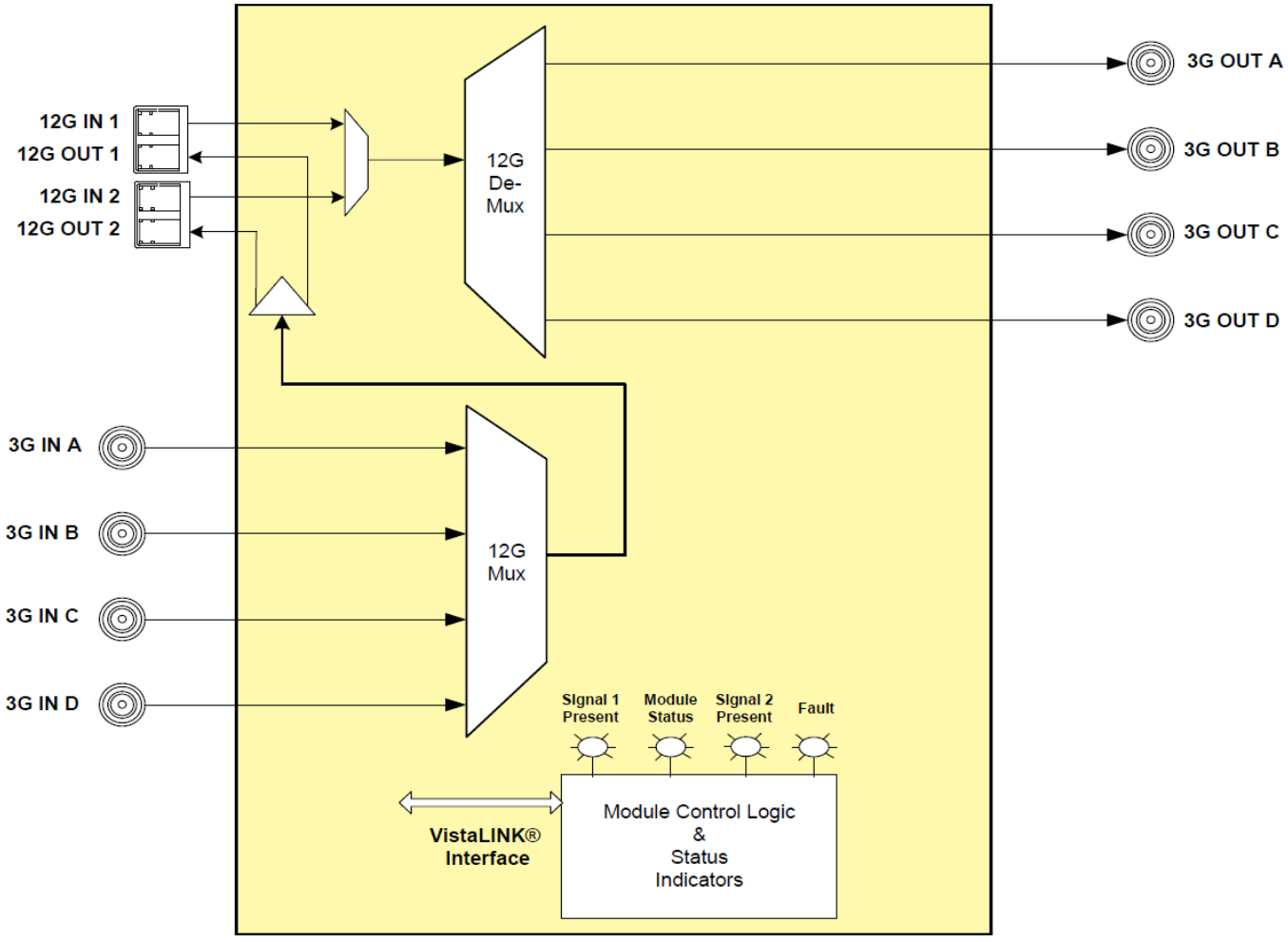

Figure 1-1: 7800MDM-12G Block Diagram

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2. INSTALLATION

The 7800MDM-12G module comes with a companion rear plate and occupies two slots in the 7800FR frame. Refer to Figure 2-1 for the 7800MDM-12G rear plate layout.

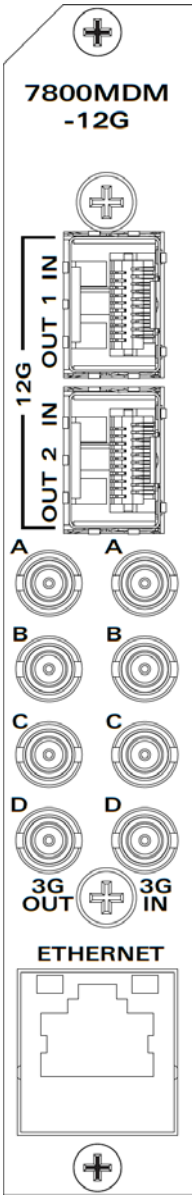


Figure 2-1: 7800MDM-12G Rear Plate

2.1. INPUT/OUTPUT CONNECTIONS

3G IN A/B/C/D: DIN connectors used to input Quad-Link 3G SDI video streams.

3G OUT A/B/C/D: DIN connectors used to output Quad-Link 3G SDI video streams.

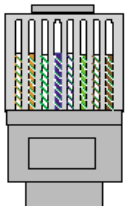
12 OUT/IN 1/2: When used with Evertz SFP3TR-DIN-12G, these provide main and backup DIN connectors used to input and/or output 12 SDI video streams.

2.2. ETHERNET CONNECTION

All 7800MDM-12G modules are designed to use either 10Base-T (10 Mbps) or 100Base-TX (100 Mbps) also known as *Fast Ethernet*, 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. Make the network connection by plugging one end of a "straight through" cable into the RJ-45 receptacle of 7800MDM-12G module and the other end into a port of the supporting hub. If you are connecting the 7800MDM-12G module directly to an Ethernet port on a computer, you will have to use a "crossover" cable.

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

Pin 1



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

Table 2-1: Colour Code Wiring for the Current RJ 45 Standards

Note the following 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 that they be present in the cable.
- 10BaseT and 100BaseT use the same pins; a crossover cable made for one will work with the other.
- Pairs may be solid colors and not have a stripe.
- Category 5 cables must use Category 5 rated connectors.

The maximum cable run between the 7800MDM-12G module and the supporting hub is 300 ft (90 m).

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3. SPECIFICATIONS

3.1. SERIAL DIGITAL VIDEO INPUT

Standard	11.88Gb/sec SMPTE 2082 (on Evertz SFP3TR-DIN-12G) 2.970 Gb/sec SMPTE 425M* (All other DIN connectors – 3G IN A-D)
Number of Inputs	1x Quad-Link 3G-SDI signal (3G IN A-D) 2x 12G-SDI inputs (one per SFP) used as a main and backup
Connector	DIN 1.0/2.3 CECC 22 230, DIN 47297 and DIN 41626
Signal Level	1V nominal
Input Equalization	Automatic to 40m @ 11.88 Gbs with Belden 1694 or equivalent

3.2. SERIAL DIGITAL VIDEO OUTPUT

Standard	11.88Gb/sec SMPTE 2082 (on Evertz SFP3TR-DIN-12G) 2.970 Gb/sec SMPTE 425M* (All other DIN connectors – 3G IN A-D)
Number of Outputs	1x Quad-Link 3G-SDI signal (3G OUT A-D) 2x 12G-SDI outputs (one per SFP) used as a main and backup
Connector	DIN 1.0/2.3 CECC 22 230, DIN 47297 and DIN 41626
Signal Level	800 mV nominal

3.3. ELECTRICAL

Voltage	+12VDC
Power	24.5 Watts
EMI/RFI	Complies with FCC regulations for class A devices. Complies with EU EMC directive.

3.4. PHYSICAL

Number of slots

7800FR Frame	1
7801FR Frame	1

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4. WEB INTERFACE

The 7800MDM-12G can be controlled using Web Interface. WebEasy operates using Ethernet and SNMP control protocols. The 7800MDM-12G DOES NOT HAVE card edge controls. As a result, 7800FC modules must be installed in all frames that house 7800MDM-12G modules, or the card must be connected directly with an Ethernet cable.

For the sake of brevity, the following sections describe module controls in terms of the parameters found within the Web Interface screens for the 7800MDM-12G. As additional features and options are released, additional sections will be appended to this manual to show those control screens.

After the card has been installed and configured with the required network addresses for the control port, it can be completely configured using the web interface. For doing this, simply type the IP address of the control port of the 7800MDM-12G module in the web browser.

Note: The computer must be on the same Subnet in order to have communication with the module.

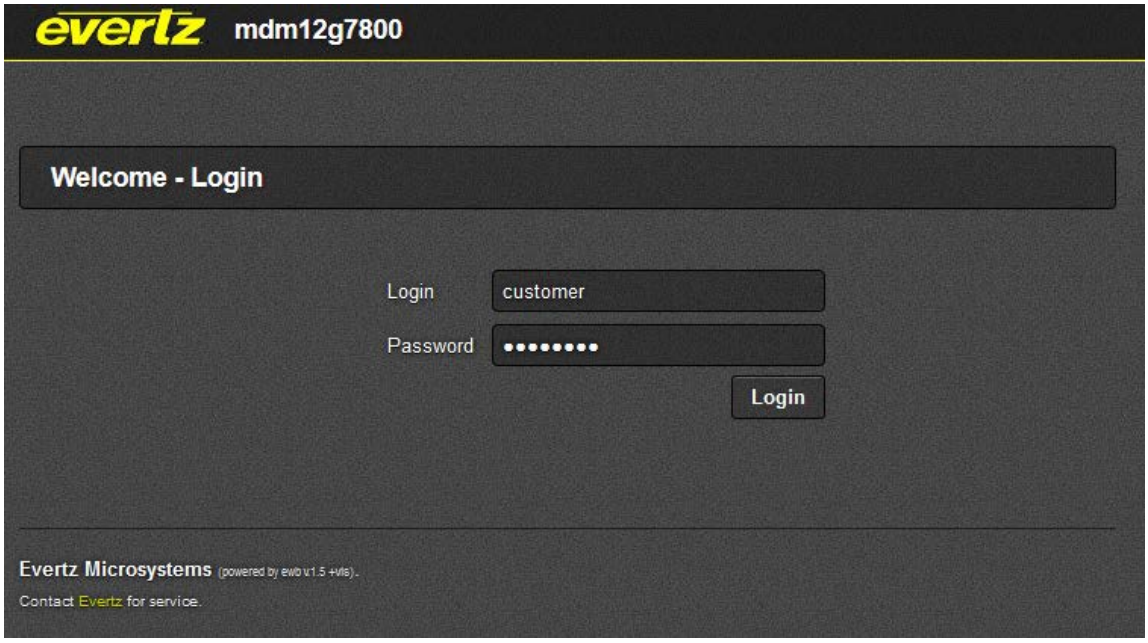

Figure 4-1: WebEASY® - Login Menu

Login and Password are "**customer**".

There are four different menus on the web interface as shown in Figure 4-2.

Figure 4-2: WebEASY® - 7800MDM-12G Menu

4.1. VIDEO

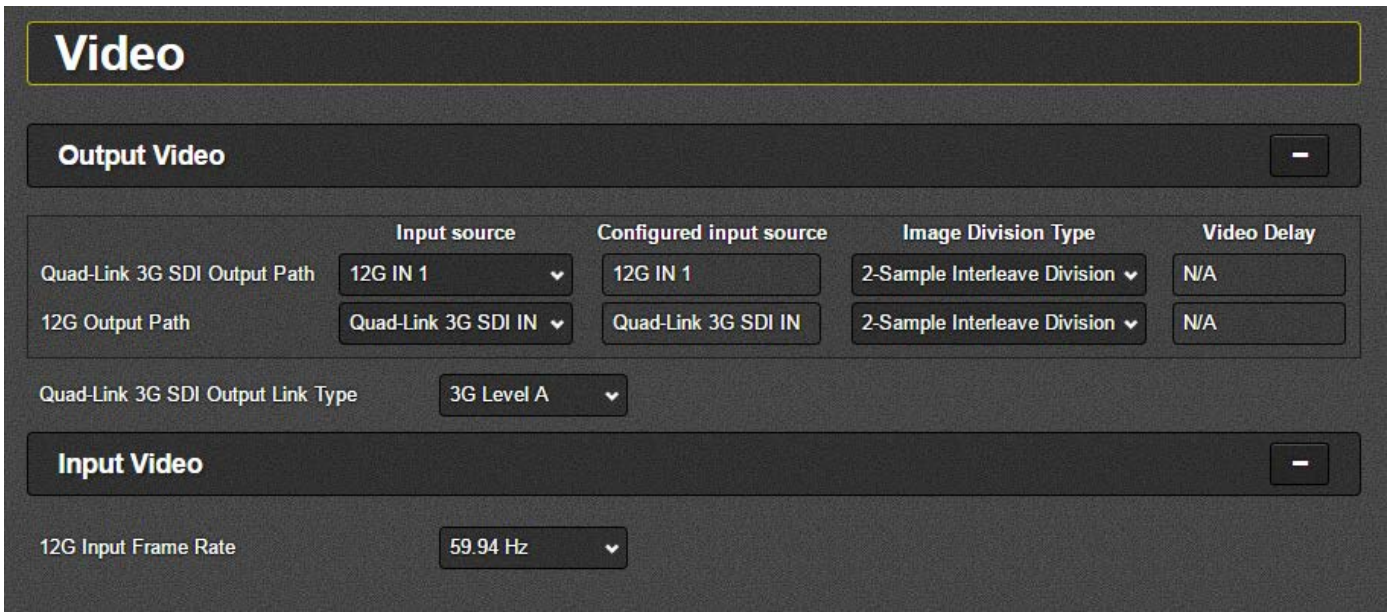

Figure 4-3: WebEASY® - Video Tab

Output Video

Input Source: This parameter allows the user to select the input source for each output path. For the Quad-Link Output Path, the options are 12G IN 1 or 12G IN 2. The 12G Output Path option is Quad-Link 3G SDI IN.

Configured Input Source: This parameter reports the input source configured for each output path. For the Quad-Link Output Path, the options are 12G IN 1 or 12G IN 2. The 12G Output Path option is Quad-Link 3G SDI IN.

Image Division Type: This parameter allows the user to select the division type for each output path. For the Quad-Link Output Path, the options are 2-Sample Interleave Division or Square Division. The 12G Output Path option is 2-Sample Interleave Division.

Video Delay: This parameter displays the video delay through the card for each output path. Values are in ms.

Quad-Link 3G SDI Output Link Type: This parameter allows the user to select the link type for the Quad-Link 3G SDI Output Path. The options are 3G Level A and B.

Input Video

12G Input Frame Rate: This parameter allows the user to select the frame rate for the 12G input. This is not automatically discovered and must be set. The user can select between 59.94 Hz and 50 Hz.

4.2. QUAD-LINK 3G SDI INPUT MONITOR

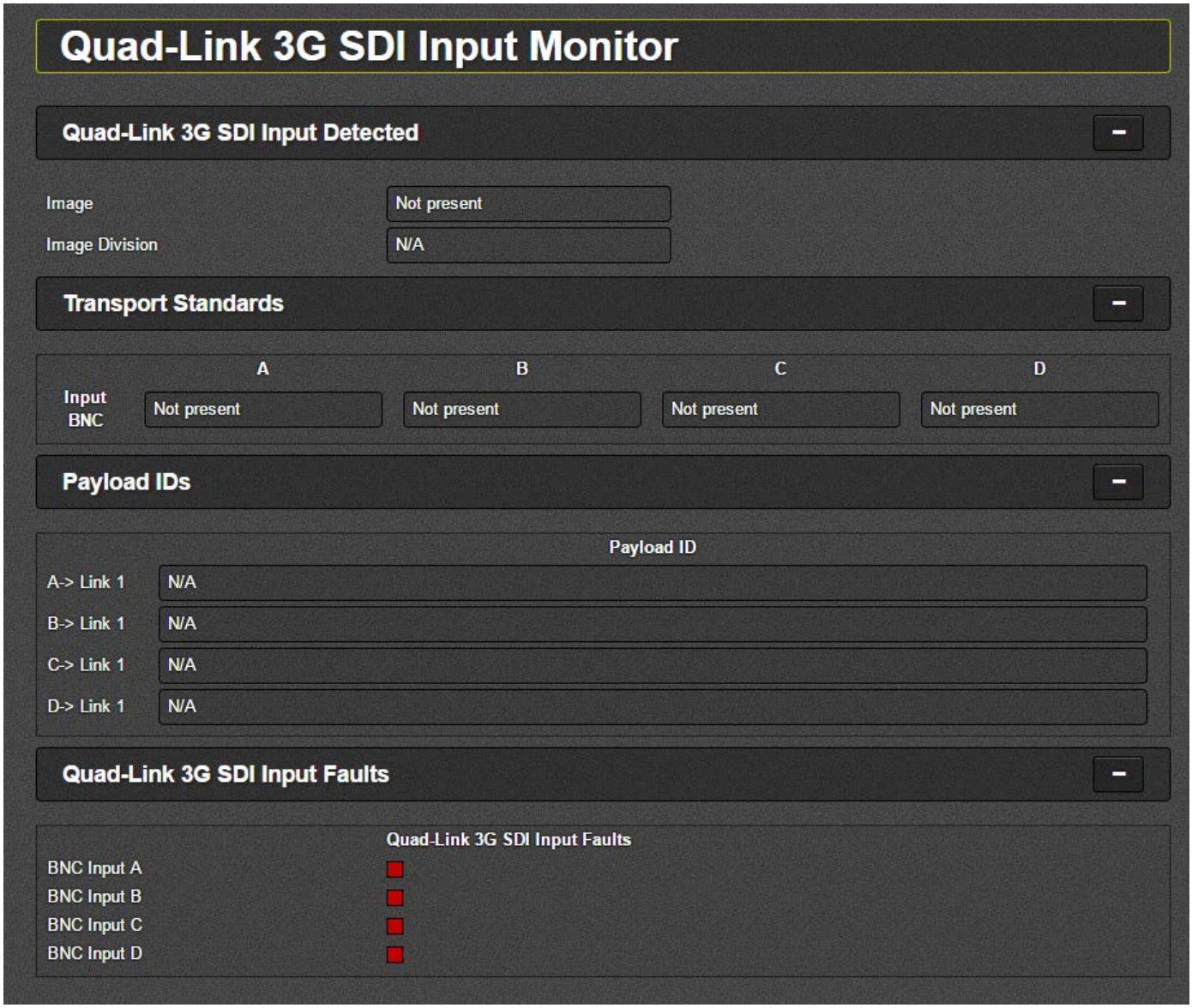

Figure 4-4: WebEASY® - Quad-Link 3G SDI Input Monitor Tab

Quad-Link 3G SDI Input Detected

Image: This parameter reports the input image detected on the Quad-Link 3G SDI input. The possible values are:

- Not Present
- 3840x2160/59.94/P
- 3840x2160/50/P

Image Division: This parameter reports the type of image division detected on the Quad-Link 3G SDI input. The possible values are:

- N/A
- 2-Sample Interleave Division
- Square Division

Transport Standards: This parameter reports the detected standard on each input BNC. The possible values are:

- Not Present
- Unknown
- 525i/59.94 (Unsupported)
- 1080i/59.94 (Unsupported)
- 720p/59.94 (Unsupported)
- 1080p/59.94 (425 Level A)
- 1080p/59.94 (425M Level B)
- 625i/50 (Unsupported)
- 1080i/50 (Unsupported)
- 720p/50 (Unsupported)
- 1080p/50 (425M Level A)
- 1080p/50 (425M Level B)

Payload IDs: This parameter reports the detected Payload ID on each input BNC, and on each link per input BNC in the case of Level B inputs.

Quad-Link 3G SDI Input Faults: This parameter reports video presence on each input BNC.

4.3. 12G INPUT MONITOR

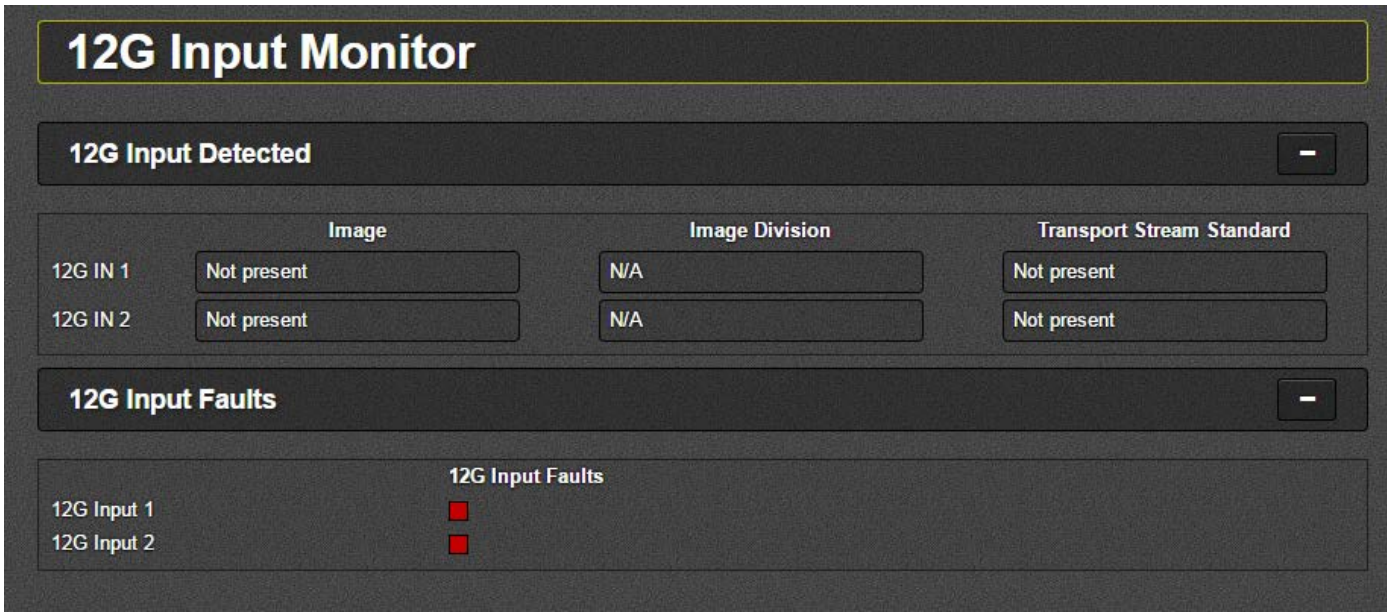

Figure 4-5: WebEASY® - 12G Input Monitor Tab

12G Input Detected

Image: This parameter reports if a 12G input image is detected for each 12G input source. The possible values are:

- Not Present
- 3840x2160/59.94/P
- 3840x2160/50/P

Image Division: This parameter reports the image division type detected for each 12G input source. Note: square division is not possible with 12G inputs). The possible values are:

- N/A
- 2-Sample Interleave Division

Transport Stream Standard: This parameter reports the standard detected for the transport stream of each 12G input source. The possible values are:

- Not Present
- Unknown
- 1080p/59.94 (425M Level A)
- 1080p/50 (425M Level A)

12G Input Faults: This parameter reports video presence on each 12G input.

4.4. AUDIO MONITOR

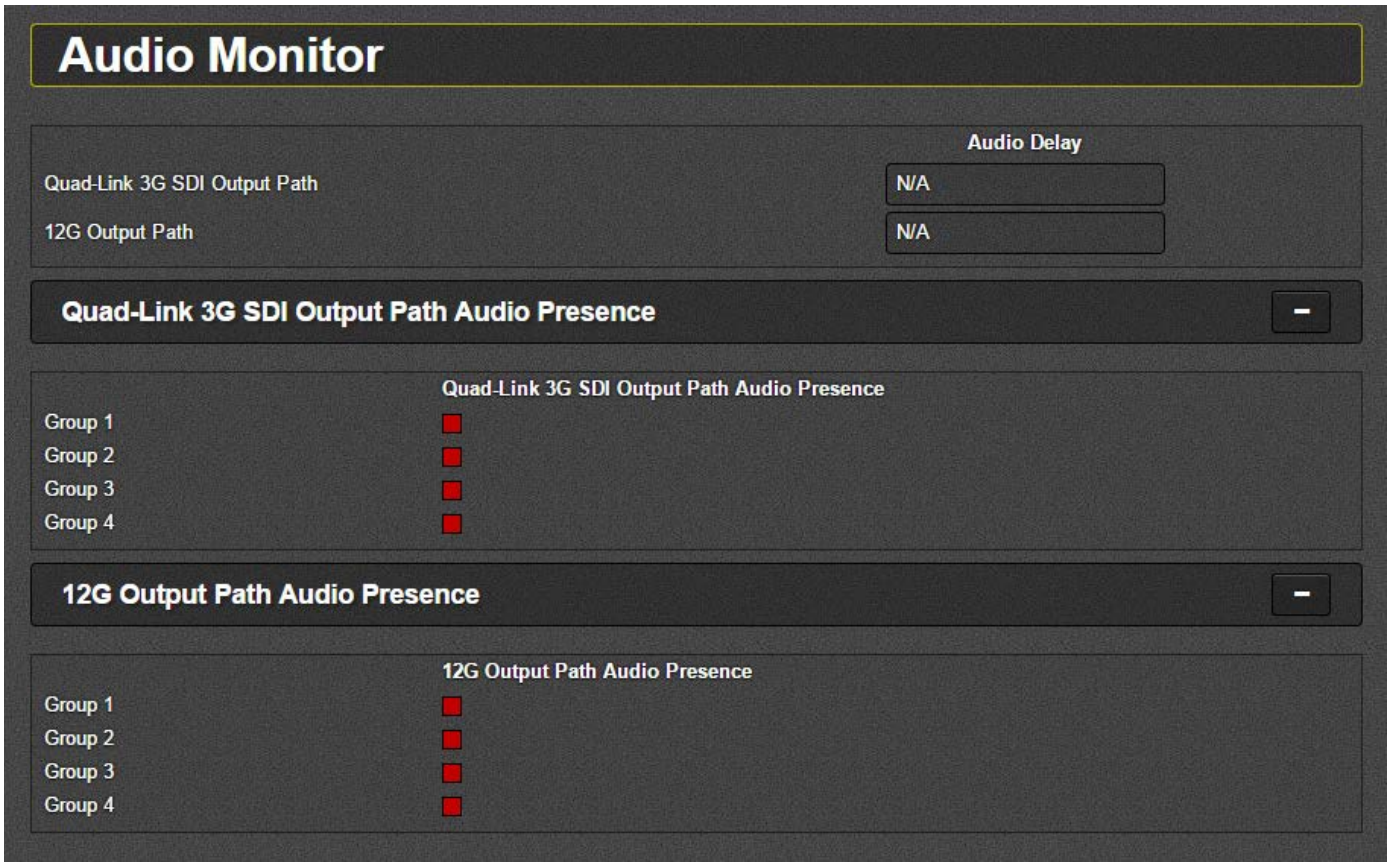

Figure 4-6: WebEASY® - Audio Monitor Tab

Audio Delay: This parameter reports the audio delay through the card for each output path. Units are in ms.

Quad-Link 3G SDI Output Path Audio Presence: This parameter reports the presence of audio groups on the Quad-Link 3G SDI output path.

12G Output Path Audio Presence: This parameter reports the presence of audio groups on the 12G output path.

5. UPGRADE PROCEDURES

5.1. FIRMWARE UPGRADE

Using the WebEASY® on a web interface is the fastest and recommended way to load the firmware onto the 7800MDM-12G.

On the top of the web page for the 7800MDM-12G, there is a button labelled Upgrade. The Upgrade tab is used to check current firmware version and upload the latest firmware.

Figure 5-1 : WebEASY® - Upgrade Button on Top Menu Bar

Selecting the Upgrade tab will take the user to Figure 5-2 where the current firmware version is shown. Should the firmware version be outdated, the user will need to download the new firmware image file.

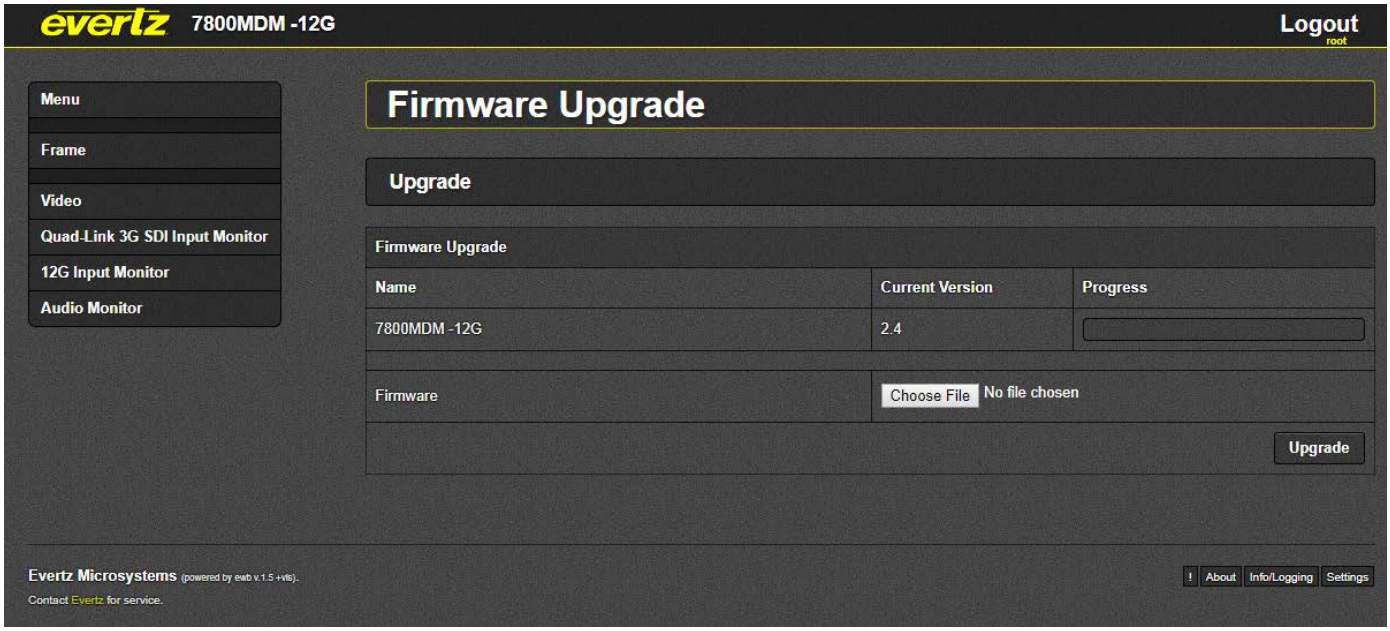

Figure 5-2 : WebEASY® - Firmware Upgrade Menu

1. Click **Choose File** and browse to locate the image file. Once selected, click **Open** to advance to next step.
2. Click **Upgrade** and watch progress bar for status. Once completed, the device will automatically restart.

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