# 570EMR-AG-HUB **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**

# <u>NOTE</u>

## **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.



EN60065 EN55103-1: 1996 EN55103-2: 1996

Safety Emission 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.**

## <u>NOTE</u>

## 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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# **REVISION HISTORY**

REVISION

0.1

**DESCRIPTION** Preliminary Release DATE

June 2018

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# 1. OVERVIEW

The 570EMR-AG-HUB is Evertz 3<sup>rd</sup> generation low latency high density gateway audio card that enables distribution of TDM / MADI over IP. It has 10 TDM / MADI inputs and 10 TDM / MADI outputs and there is no redundancy for TDM / MADI Inputs and Outputs. Each TDM input carries 512 mono audio channels and MADI Input carries 64 mono audio channels. This card supports two Audio over IP standards ST302M and AES67. MADI feature can be enabled only through license (FK-MADI).

This module provides a gateway to link into IP infrastructures as well as a more efficient way to tie-line routers together. IP based audio packetized and transported over fiber will provide greater density and longer distances than coax based solutions would yield. TDM audio sources and destinations include all EMR audio modules plus EQX embedders, deembedders & frame-syncs. Each Transport Stream has 4 Audio channels and must have one dedicated Multicast Address associated with it. Each TDM input must have 128 dedicated multicast addresses of Transport Streams. The 570EMR-AG-HUB rear panel occupies 2 slots in 570 Frame and has 20 x DIN 1.0/2.3 connectors.

#### 1.1. FEATURES & BENEFITS

- 10 TDM / MADI Inputs
- 10 TDM / MADI Outputs
- 8 x SFP+ 10GE trunk interfaces
- Supports TDM V2
- Supports pop Suppression
- Supports PCR and PTP
- Supports ST302M and AES67 audio over IP standards

### 1.2. SYSTEM I/O

#### 20 TDM / MADI DIN Inputs/Outputs:

- 20 x DIN 1.0/2.3 Connectors
- Supports 512 Mono audio channels in each TDM Inputs and Outputs
- Supports 64 Mono audio channels in each MADI Inputs and Outputs
- According to the Rear Plate screening:
  - o TDM Inputs 1-10 DIN Connectors
  - o TDM Outputs 11-20 DIN Connectors

#### 8 x 10GE SFP+ Ports:

- Support 128 Multicast addresses for each TDM Inputs and Outputs
- Support 16 Multicast addresses for each MADI Inputs and Outputs
- SFP 1 sends/receives ST302M audio for TDM Inputs 1-5 and TDM Outputs 11-15
- SFP 2 is the IP redundant of SFP 1.
- SFP 3 sends/receives ST302M audio for TDM Inputs 6-10 and TDM Outputs 16-20
- SFP 4 is the IP redundant of SFP 3



- SFP 5 sends/receives AES67 audio for TDM Inputs 1-5 and TDM Outputs 11-15
- SFP 6 is the IP redundant of SFP 5.
- SFP 7 sends/receives AES67 audio for TDM Inputs 6-10 and TDM Outputs 16-20
- SFP 8 is the IP redundant of SFP 7

#### InBand Control:

• SFP1, SFP2, SFP3, SFP5, SFP6, SFP7 is used for Main or Redundant Inband Control.

#### **RTP Control:**

- Option to globally Enable or Disable the RTP header for the incoming TS's
- Incoming TS's doesn't have RTP header and AG card is set Enable for RTP There will be no audio in TDM Outputs.
- Incoming TS's has RTP header and AG card is set Enable for RTP There will be audio in TDM Outputs.
- Incoming TS's doesn't have RTP header and AG card is set Disable for RTP There will be audio in TDM Outputs.
- Incoming TS's has RTP header and AG card is set Disable for RTP There will be no audio in TDM Outputs.



# 2. SPECIFICATIONS

l

### 2.2. ETHERNET INTERFACE

Number of SFP Ports	8 x 10GE SFP+ (Rest of them are for future development)

# 2.3. ELECTRICAL

Voltage	+12VDC
Power Consumption	70W

#### 2.4. FRAMES

Frame and Slot Occupancy	570 Frame with 2 slot occupancy	
	570 Standalone Frame	



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# 3. INSTALLATION

#### 3.1. FRONT AND REAR PLATE



Figure 3-1 : 570EMR Front (left) and Rear Plate (right)

#### 3.1.1. Front Plate

The front plate of 570EMR-AG-HUB is equipped with 12 10GE SFP ports capable of passing/receiving 10GE of data per port. Only 8 x 10GE SFP ports are available to be used.

#### 3.1.2. Rear Plate

The rear plate of 570EMR-AG-HUB is equipped with 20 DIN connectors. The 1-10 DIN connectors are used for TDM / MADI Inputs and 11-20 DIN connectors are used for TDM / MADI Outputs.



## 3.1.3. Rear Plate Mapping

10x10 TDM/MADI



Figure 3-2 : 570EMR Main TDM/MADI Inputs & Outputs



# 4. HARDWARE INSTALLATION

570EMR-AG-HUB can be installed in one of the following two ways:

- 1. 570 Frame communication via Frame Controller
- 2. Standalone 570 Frame (Direct Communication)

Before handling the card, it is important to minimize the potential effects of static electricity. It is therefore recommended that an ESD strap to be worn.

Locate on the chassis two vacant slots. Unpack the 570EMR-AG-HUB and separate the rear panel from the main card. Locate on the rear of the rack the two slots and remove the blank panels. Insert the rear panel into the back of the chassis and secure using the screws provided. Now insert the 570EMR-AG-HUB card into the corresponding front slots ensuring the card lines up with the slot runners on the bottom and the top of the chassis. Push the card **firmly** into the slot ensuring that when it mates with the rear card it has been firmly pushed into a seated position. Do not connect any cables to the rear card (failure to do this could cause unwanted network issues) until the initial configuration has been completed. This procedure can be completed to all the other modules and is hot swappable allowing for the frame to be powered on while installing.



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# 5. CONFIGURING 570EMR THROUGH WEBEASY®

The 570FC provides a built-in web interface that allows a user to interact with the 570FC as well as WebEASY<sub>®</sub> supported products using a standard Internet web browser. The 570FC web interface can be accessed by entering the IP address of the 570FC into the address bar of an Internet web browser. When first visit the 570FC web interface, the user will be asked to enter a Login and Password.

Username: root Password: evertz

The home page of 570FC provides a list of all products currently under the control of the 570FC along with a menu that allows insight into specific *Product Location, Hardware, Software, SNMP V1 Community* strings, *SNMP V1 Trap* destinations and local *TRAP Management Faults* for the 570FC.

570EMR can receive IP address from 570FC through proxy mode. To receive the IP address from 570FC, Click "Software" tab from 570FC webpage and select the IP Configure Mode "*Static or DHCP*". Then select the "*Slot#*", where you see the 570EMR in 570 Menu Page and "Enable" the Proxy Mode under the selected Slot#, then it will displays three fields to enter the IP Address, Netmask and Gateway. After configuring three fields, Click "Apply" to save the settings and refresh the page to see the settings are saved.

Go back to 570FC Home Page, it will provide a list of all 570EMR currently in the frame. It will also provide the firmware version of each card in the frame. Cards that appear in white text do not support the WebEASY<sub>®</sub> interface and are therefore not configurable though the web interface. These cards must be configured using VistaLINK<sub>®</sub> or Serial Menu. Cards that support the WebEASY<sub>®</sub> interface will appear in yellow. Click on the yellow product name which is linked to the controls available for that card.

*Refresh, Apply,* and *Dynamic Apply* buttons on top of the page are used to apply changes to the config and refresh to check current status of the config. These function in the same manner as the in VistaLINK<sub> $\otimes$ </sub>.



#### 5.1. SYSTEM

This tab provides the basic configurations/Monitoring of IP address, InBand Control, Data Port Monitoring and Reference.

EVERIZ 570EMR-AG-HUB C Refresh	😋 Auto Refresh 👲 Apply 👲 Dynamic Apply	🖨 Upgrade	Log	out
Menu	Custom			_
	System			
System	0			
Product Features	Control Port Configuration			-
Signal Input	Ethernet Prozy			
IP Output (S382M)	IP Address	192.168.245.17		
IP Output (AE S67)	Netmask	255 255 255 0		
IP Input (S302M) IP Input (AES67)	Gatimury	192 168 245 1		
II' Input (AE SH7) Signal Output				
Delay Control	Data Port Configuration			- 1
PCR Control	SEP			
PTP Control	2345578			
Notity	IP Address	192.168.1.10		
	Netmask	255 255 255 0		
	Gateway	192 168 1 1		
	Data Port Monitor			
	STP			
	2 3 4 5 6 7 8			
	Ethernet Rx Dandwidth			
	Ethernet Rx Frames Ok.			
	Ethernet Ro Frames Err	0		
	Ethernet Rx Broadcast Frames			
	Ethernet Rx Unicast Frames	0	Fames	
	Ethernet Rx MultiCast Frames	778,939		
	Ethernet Tx Bandwidth			
	Ethernet Tx Frames Ok	778,945	France	
	Ethomet Tx Frames En		France	
	Ethernet Ta Broadcast Framm			
	Ethernet Tx Unicast Frames	•	France	
	Ethernet Tx MultiCast Frames	778.941	France .	
	Ethernet Link Status	tex tip		
		Clear Stats		
	i. Dermonischer			
	SFP Control			
	SFP Delection	Ada		
	SFP Monitor			-4
	Filter			
	2345678			
	SFP Part Number	SEP10G-TR13-A		
	SFP Type	Optical		
	SFP Rx Power Level			
	SFP Tx Power Level			
	Genlock Control			2
	Reference Selection	Ref 1 +		
	Geniock Status	Looked		
	Genlock Present	Present		
	Genick Standard	NTSC		
	In-band Control			50
	In-band Control			-
	Primary Secondary			
	Data Perl	SFP 1	Need whout to late effect	
	Control MultiCast IP	239.0.0.1		
	Tally MultiCast IP	240.0.0.1		
	RPC Timeout			
	RPC Tenoout	30,000	(* 10 2000) me	
	Card Control			-
	Card Alas			
		Purge Card		
		Loed Factory Config		
		Reboot Card		

Figure 5-1 : WebEASY $_{\ensuremath{\mathbb{R}}}$  - System



#### 5.1.1. Control Port Configuration

**Ethernet:** Allows the user to set the IP Address, Netmask and Gateway. This IP Address is used for control and monitor, when 570EMR in standalone frame.

**Proxy:** This IP Address is received from 570FC through proxy. Doesn't allow the user to change the IP in 570EMR webpage but user can change the IP Address in 570FC Software tab page. This IP address is used for control and monitor when 570EMR in 570 Frame with 570FC.

#### 5.1.2. Data Port Configuration

Only 8 SFPs are currently available and the user can set the following parameters on each SFPs. Make sure SFP's data ports must have different subnet IP address.

**IP Address:** This parameter allows the user to set the IP Address for the data port.

**NetMask:** This parameter allows the user to set the Netmask for the data port.

Gateway: This parameter allows the user to set the gateway for the data port.

#### 5.1.3. Data Port Monitor

This section allows the user to monitor the following parameters on each SFP's.

Ethernet Rx Bandwidth: Displays the Received Ethernet Bandwidth displayed in Mbps. Ethernet Rx Frames Ok: Displays the number of Error-Free Frames Received. Ethernet Rx Frames Err: Displays the number of Erroneous Frames Received. Ethernet Rx Broadcast Frames: Displays the number of Broadcast Frames Received. Ethernet Rx Unicast Frames: Displays the number of Unicast Frames Received. Ethernet Rx MultiCast Frames: Displays the number of Multicast Frames Received. Ethernet Tx Bandwidth: Displays the Transmitted Ethernet Bandwidth displayed in Mbps. Ethernet Tx Frames Ok: Displays the number of Error-free Frames Transmitted. Ethernet Tx Frames Err: Displays the number of Erroneous Frames Transmitted. Ethernet Tx Broadcast Frames: Displays the number of Broadcast Frames Transmitted. Ethernet Tx Broadcast Frames: Displays the number of Broadcast Frames Transmitted. Ethernet Tx Broadcast Frames: Displays the number of Broadcast Frames Transmitted. Ethernet Tx Unicast Frames: Displays the number of Unicast Frames Transmitted. Ethernet Tx Unicast Frames: Displays the number of Unicast Frames Transmitted. Ethernet Tx MultiCast Frames: Displays the number of Multicast Frames Transmitted. Ethernet Tx MultiCast Frames: Displays the number of Multicast Frames Transmitted. Ethernet Tx MultiCast Frames: Displays the number of Multicast Frames Transmitted. Ethernet Tx MultiCast Frames: Displays the number of Multicast Frames Transmitted. Ethernet Link Status: Displays the Ethernet port link status as either up or down. Clear Stats: Allows the user to clear the Stats recorded above by pushing the button.

#### 5.1.4. SFP Control

**SFP Detection:** This control allows the user to specify the type of cable used with the SFP. Options are Auto, Optical, Copper 3m and Copper 5m.



#### 5.1.5. SFP Monitor

This option is available for only three SFPs. The user can view the following parameters on each SFP.

**SFP Part Number:** Displays the part number of the SFP.

**SFP Type:** Displays the type of the SFP.

SFP Rx Power Level: Displays the receiver power level of the SFP.

SFP Tx Power Level: Displays the transmitter power level of the SFP.

#### 5.1.6. Genlock Control

Reference Selection: Allows the user to select the reference from REF 1 or REF 2.Genlock Status: Displays if the selected reference is LOCKED or UNLOCKED.Genlock Present: Displays if the selected reference is PRESENT or ABSENT.Genlock Standard: Displays the standard of the selected reference.

#### 5.1.7. InBand Control

**Data Port:** Enable the Inband control on the selected SFP port (SFP 1, 2, 3, 5, 6, 7). **Control Multicast IP:** Allows the user to set the receiving RPC multicast IP address. **Tally Multicast IP:** Allows the user to set the Tally IP address.

#### 5.1.8. RPC TimeOut

This control allows the user to set the timeout for RPC Connection.

#### 5.1.9. Card Control

Card Alias: Allows the user to set the name of the 570EMR-AG-HUB.Purge Card: Allows the user to clear all the settings in 570EMR.Load Factory Config: Allows the user to load the factory configuration.Reboot Card: Allows the user to reboot the 570EMR.



#### 5.2. PRODUCT FEATURES

Menu	Product Features	
System		
Product Features	Product Features	
Signal Input	Product Feature	
IP Output (S302M)	2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	
IP Output (AES67)	Product Feature Name FK MADI	
IP Input (S302M)	Product Feature Supported Enabled	
IP Input (AE S67)		
Signal Output	License Control	-
Delay Control		
PCR Control	Export Product License File	Downloa
PTP Control	Import Product License File Choose File No Bla chasen	Uplos
Notify	Product Serial Number 7678130035	

This section provides whether the card has license for MADI feature.

Figure 5-2 : WebEASY® - Product Features

#### 5.3. SIGNAL INPUT

This section provides the information on TDM / MADI Link, TDM Source Identifier and TDM / MADI audio channel presence and also it detects the pop/clicks in the incoming TDM signal.

<b>EVERIZ</b> 570EMR-AG-HUB C Refresh	😋 Auto Refresh 🛓 Apply 🛓 Dynamic Apply 🚔 Upgrade	Logout	
Menu	Circust Innut		
menu	Signal Input		
System			
Product Features	Global Control		
Signal Input	Enable Pop Suppression Enable 🗸		
IP Output (S302M)	Enable Pop Suppression Enable 🗸		
IP Output (AES67)	Link Monitoring		
IP Input (S302M)			
IP Input (AES67)			
Signal Output	1 2 3 4 5 6 7 8 9 10 TOM Source Detected		
Delay Control	MADI Source Detected		
PCR Control	Audio Pop Reset		
PTP Control			
Notify	Channel Monitoring		
	1, 2 3 4 5 6 7 8 9 10 Channel Present	Audio Pop	
	Channel 1		
	Channel 2		
	Channel 3 Channel 4		
	Channel 5		
	Channel 6		
	Channel 7		
	Channel 8 Channel 9		
	Channel 10		
	Channel 11		
	Channel 12		
	Channel 13		
	Channel 14 Channel 15		
	Channel 16		

Figure 5-3 : WebEASY<sub>®</sub> - Signal Input



#### 5.3.1. Global Control

**Enable Pop Suppression:** This section allows the user to enable or disable the Pop suppression globally. Pop suppression is used for reducing the pop/click sound when the audio switch happens in upstream path.

#### 5.3.2. Link Monitoring

For each of 10 TDM inputs, the user can view the following parameters.

**TDM Source Detected:** Displays the status of the TDM Input Presence.

**TDM Source Identifier:** Displays where the TDM input source comes from.

MADI Source Detected: Displays the status of the MADI Input Presence.

#### 5.3.3. Channel Monitoring

User can monitor all 512 channel presence in each TDM Inputs and MADI Inputs. User can expand to view the status of all 512 channels by clicking this button "+". If MADI Input is connected, first 64 audio channels responds to the MADI signals and rest of the audio channels shows red.

#### 5.4. IP OUTPUT (S302M)

lenu	IP Output (S302M	)		
ystem				
roduct Features	SFP Output			
ignal Input				
P Output (S302M)	SFP1 - Main , SFP2 - Backup SFP3	- Main SFP4 - Backup		
Output (AES67)	Express IP Output			
Input (S302M)	LINK			
Input (AES67)	1, 2 3 4 5			
gnal Output	Output IP Address Range			
lay Control		(e.g. 239.0.0 1-100.239.1.1.10.239.1.1.6		
CR Control	Output UDP Port	0	(0 to 65535)	
P Control		Purge Routes		
tify				
	IP Output Control			
	LINK			
	1, 2 3 4 5			
		IP Output Status	IP Output Destination IP Address	IP Output Destination UDP Port
			0.0.0.0	0
	TS 2		0.0.0.0	0
	TS 3		0.0.0.0	0
	TS 4		0.0.0	0
	TS 5		0.0.0	0
	IP Output Advanced Control			
	LINK 1 2 3 4 5			
	IP Output Source IP Address	192.168.0.1		
	IP Output Source UDP Port	0	(0 to 65535)	
	IP Output Type Of Service	0		
	IP Output Time To Live	64		
tz Microsystems (powered by metry 1.5 +vfs).				t About Into/Logging S

Figure 5-4 : WebEASY® - IP Output (S302M)



#### 5.4.1. SFP Output

SFP2 is the backup of SFP1 and SFP4 is the backup of SFP3. Clicking each SFP's button shows the status, Multicast address and Port# for each Transport Streams.

#### 5.4.2. Express IP Output Control

This section allows the user to set the Multicast Address and Port# for each TDM by selecting the individual TDM Ports.

#### 5.4.3. IP Output Control

This section allows the user to see or set the Multicast Address and UDP Port# for each Transport Stream in each TDM Inputs. Also it displays the status of the IP Output.



**NOTE:** All the multicast addresses are set automatically via SDVN. Manual setup is for exceptional cases.

#### 5.4.4. IP Output Advanced Control

**IP Output Source IP Address:** This field allows the user to set the Source IP Address of each TDM Input.

**IP Output Source UDP Port:** This field allows the user to set the Source UDP Port of each TDM Input.

**IP Output Type Of Service:** This field allows the user to set the ToS. If the network doesn't support ToS, *use zero as default*.

**IP Output Time To Live:** This field allows the user to set the Time To Live (TTL) value.



#### 5.5. IP OUTPUT (AES67)

EVERIZ 570EMR-AG-HUB C	Refresh 😋 Auto Refresh 🛓 Apply 🎍 Dynam	nic Apply 🔹 Upgrade		Logout
Menu	IP Output (AES67)			
System				
Product Features	AES67 Packet Time			
Signal Input				
IP Output (S302M)	AES67 IP Output Packet Time	125us	•	
IP Output (AES67)	SFP Output			
IP Input (S302M)				
IP Input (AES67)	SFP5 - Main SFP6 - Backup SFP7 - M	Main SFP8 - Backup		
Signal Output	Express IP Output			
Delay Control	LINK			
PCR Control	1, 2 3 4 5			
PTP Control	Output IP Address Range			
Notify	Output IP Address Range	(e.g. 239.0.0 1-100 239.1 1.10 239.1 1.6	6-89)	
	Output UDP Port	0	(0 to 65535)	
		Purge Routes		
	IP Output Control			
	LINK			
	1, 2 3 4 5			
		IP Output Status	IP Output Destination IP Address	IP Output Destination UDP Port (الله 65535)
			0.0.0	0
			0.0.0	
			0.0.0	0
			0.0.0	0
			0.0.0.0	
	Citabil + Investmentstations			
	IP Output Advanced Control			
	LINK			
	1, 2 3 4 5			
	IP Output Source IP Address	192 168.0.1		
	IP Output Source UDP Port	0	(0 to 65535)	
	IP Output Type Of Service	0		
	IP Output Time To Live	64		

Figure 5-5 : WebEASY<sub>®</sub> - IP Output (AES67)

#### 5.5.1. AES67 packet Time

Packet time is the real-time duration of the media data contained in a media packet. Given the sampling rate and packet time, the number of samples per packet can be calculated. Short packet times allow for lower latency but introduce overhead and high packet rates that may overtax some devices or networks. Long packet times imply higher latency and require additional buffering which may not be available on memory-constrained devices.

AG-HUB supports 1ms and 125µs packet time for AES67.

#### 5.5.2. SFP Port Output

SFP6 is the backup of SFP5 and SFP8 is the backup of SFP7. Clicking each SFP's button shows the status and Multicast address and Port# for each Transport Streams.

#### 5.5.3. Express IP Output Control

This section allows the user to set the Multicast Address and Port# for each TDM by selecting the individual TDM Ports.



#### 5.5.4. IP Output Control

This section allows the user to see or set the Multicast Address and UDP Port# for the each Transport Stream in each TDM Inputs. Also it displays the status of the IP Output.



**NOTE:** All the multicast addresses are set automatically via SDVN. Manual setup is for exceptional cases.

#### 5.5.5. IP Output Advanced Control

**IP Output Source IP Address:** Allows the user to set the Source IP Address of each TDM Input.

**IP Output Source UDP Port:** Allows the user to set the Source UDP Port of each TDM Input.

**IP Output Type Of Service:** Allows the user to set the ToS, if the network doesn't support ToS, *use zero as default*.

IP Output Time To Live: Allows the user to set the Time to Live (TTL) Value.

#### 5.6. IP INPUT (S302M)

EVERIZ 570EMR-AG-HUB C Refresh	🕄 Auto Refresh 👲 Apply 👲 Dynamic Apply	42s Upgrade			Logout
Menu	IP Input (S302M)				
System					
Product Features	Global Control				
Signal Input			SO NUMBER OF STREET		
IP Output (\$302M)	SFP1 & SFP2 _ SFP3 & SFP4				
IP Output (AES67)	SFP Redundancy Selection	SEP 1			
IP Input (\$302M)		Clear RTP Sequence Erro	215		
IP Input (AE S67)	(Instantion of the second s				
Signal Output	SFP Input				
Delay Control	SFP1 - Main , SFP2 - Backup SFP3 - Main S	CD4 Darkun			
PCR Control	arra dattap arra mani a	nre backap			
PTP Control	Express IP Input				
Notify	LINK				
	11, 12 13 14 15				
	Input IP Address Range				
		je ji 239 0.0 1 100 229 1 1 10 239			
	Input UDP Port	0	(0 to 65535)		
		Purge Routes			
	IP Input Control				-1
	IP/Port pair assignments must be unique per SI	P. Setting an IP/Port pair whic	h already exists on the same SFP v	vill tai!	
	LINK 11, 12 13 14 15				
		IP Input Present	RTP Sequence Errors	IP Input IP Address	IP Input UDP Port (7 to 65535)
				0000	0
				0000	0
				0000	0
	TS 4			0000	•
	TS 5			0000	0
	RTP Control				
	IP Input Streams Use RTP	Yes	•		
تسريكي لللبين القرابات وتؤريها	~ 모양 ~ 사망님, 것 방법 않고 데는 것보다.				

Figure 5-6 : WebEASY<sub>®</sub> - IP Input (S302M)



#### 5.6.1. Global Control

SFP redundancy Selection: Allows the user to see whether the traffic for IP to TDM Output path is on SFP1 or SFP2, SFP3 or SFP4.

#### 5.6.2. Express IP Input

This section allows the user to set the Multicast Address and Port# for each TDM by selecting the individual TDM Ports.

#### 5.6.3. IP Input Control

This section allows the user to see and set the Multicast Address and UDP Port# for the each Transport Stream in each TDM Inputs. Also it displays the status of the IP Input and RTP Sequence Errors.

#### 5.6.4. RTP Control

This mode is used for filtering the RTP header and it is applied for entire TDM Outputs. For instance, if the incoming IP packet doesn't have RTP Header, and does want to pass audio through TDM Outputs, then select "NO" for "IP Input streams use RTP".

### 5.7. IP INPUT (AES67)

EVERIZ 570EMR-AG-HUB C Refresh	😋 Auto Refresh 👲 Apply	👲 Dynamic Apply	🏠 Upgrade			Logout
Menu	IP Input (AES	567)				
System						
Product Features	Global Control					
Signal Input	SFP5 & SFP6 SFP7 & SFP8					
IP Output (\$302M)	SFP Redundancy Selection		SFP 5			
IP Output (AES67) IP Input (S302M)			Clear RTP Sequence Erro	ors		
IP Input (AE S67)						
Signal Output	SFP Input					
Delay Control	SFP5 - Main SFP6 - Backup	o SFP7 - Main Sf	D9 Destur			
PCR Control		) SFF7 - Maili Sf	то - Баскир			
PTP Control	Express IP Input					
Notify	LINK					
	11, 12 13 14 1	15				
	Input IP Address Range		(e.g. 239.0.0.1-100.239.1.1.10.239.1	1 4 45.00		
	Input UDP Port		0	(0 to 65535)		
			Purge Routes			
	IP Input Control					
	- IP/Port pair assignments	must be unique per SFF	P. Setting an IP/Port pair whic	h already exists on the same SFP w	ill fail!	
	LINK					
	11 12 13 14 1	15				
			IP Input Present	RTP Sequence Errors	IP Input IP Address	IP Input UDP Port (0 to 65535)
					0.0.0	0
					0.0.0.0	0
					0.0.0.0	0
					0.0.0	0
					0.0.0.0	0

Figure 5-7 : WebEASY<sub>®</sub> - IP Input (AES67)



#### 5.7.1. Global Control

SFP redundancy Selection: This field allows the user to see whether the traffic for IP to TDM Output path is on SFP1 or SFP2, SFP3 or SFP4.

#### 5.7.2. Express IP Input

This section allows the user to set the Multicast Address and Port# for each TDM by selecting the individual TDM Ports.

#### 5.7.3. IP Input Control

This section allows the user to see and set the Multicast Address and UDP Port# for each Transport Stream in each TDM Inputs. Also it displays the status of the IP Input and RTP Sequence Errors.

#### 5.8. SIGNAL OUTPUT

EVERIZ 570EMR-AG-HUB C Refresh	C Auto Refresh 🛨 Apply 🏦 Dynamic Apply 🎄 Upgrade	Logout
Menu	Signal Output	
System		
Product Features	Output Control	
Signal Input	LINK	
IP Output (S302M)	11 12 13 14 15 16 17 18 19 20	
IP Output (AE \$67)		
IP Input (S302M)	laput Source S302M +	
IP Input (AE \$67)	Output Mode MADI 👻	
Signal Output	Channel Monitoring	[/=/]
Delay Control		
PCR Control	LINK	
PTP Control	11, 12 13 14 15 16 17 18 19 20	
Notity	Channel 1 Channel 2 Channel 2 Channel 3 Channel 4 Channel 6 Channel 6 Channel 6 Channel 7 Channel 10 Channel 10 Channel 10 Channel 11 Channel 12 Channel 12 Channel 12 Channel 13 Channel 14 Channel 15 Channel 15 Channel 16 Channel 16 Channel 16 Channel 17 Channel 18 Channel 19 Channel 19 Channel 10 Channel 10 Cha	

Figure 5-8 : WebEASY<sub>®</sub> - Signal Output

#### 5.8.1. Output Control

The user must select the input source from ST302M or AES67 and output Mode from TDM or MADI.

#### 5.8.2. Channel Monitoring

User can monitor all 512 channel/carrier presence in each TDM Outputs. User can expand to view the status of all 512 channels by clicking this button "+". If user expecting MADI output, then first 64 channels responds to the MADI Outputs and rest of the audio channels shows Red.



#### 5.9. DELAY CONTROL

EVERIZ 570EMR-AG-HUB C Refres	sh 😋 Auto Refresh 🛓 Apply 🛓 Dynamic Apply	4 Upgrade	Logou
Menu	Delay Control		
System			
Product Features	Global Delay Control		
Signal Input			
IP Output (S302M)	Network Delay for Auto Mode	1 (9 to A) induces and	
IP Output (AES67)	PTS Offset for Auto Mode	0 (7 kr 90) milionarch	
IP Input (S302M)	EMR Delay for Manual Mode	1 (7 to 5) subseconds	
IP Input (AES67)	Global Audio Delay Mode	Auto (Use PCR) 🐱	
Signal Output		Clear Delay Monitor Status	
Delay Control	Per-Stream Delay Control and Monitor		-
PCR Control			
PTP Control	LINK		
Notify		19 20	
	Resync Event Mor	itor Underflow Event Monitor	Audio Delay Mode
	Stream 1		Auto (Use PCR) 🗸
	Stream 2		Auto (Use PCR) 🗸
	Stream 3	e de la companya de l	Auto (Use PCR) 🛛 👻
	Stream 4		Auto (Use PCR) 🗸 🗸
	Stream 5		Auto (Use PCR) 🐱
	+		

Figure 5-9 : WebEASY<sub>®</sub> - Delay Control

#### Manual and Auto Mode

#### In AUTO Mode:

\* "**Network Delay**", i.e., this control allows the user to set the upper limit on time for audio to reach AG-HUB from upstream source (in this case IPG), usually 1ms enough.

\* "**PTS Offset**", i.e., if sending device is adding any offset to Master PCR, before stamping the PTS value on its output audio. 570IPG does not add any offset, so this can/should be 0 in your case. But some compressed (JPG/MPG) devices add Codec Latency value, and that offset should be told to AG-HUB. Otherwise AG-HUB will get audio packets that are too far 'in the future', and it won't know how to store them.

#### In MANUAL mode:

\* User only needs to specify how much input-to-output delay you want thru the AG-HUB. Jamming will bring both counters close enough to permit proper sync. They should never go out of sync again, as long they're running off the same Ref.



#### 5.10. PCR CONTROL

EVERIZ 570EMR-AG-HUB C Refresh	😋 Auto Refresh 👲 Apply 🎍 Dyna	mic Apply 🎄 Upgrade		Logou
Menu	PCR Control			
System				
Product Features	PCR Output PID			
Signal Input				
P Output (\$302M)	PCR Output PID	256	(14 in \$150)	
P Output (AES67)	PCR Output Control			
P Input (\$302M)				
P Input (AE 567)	SFP 1, 2 3 4			
iignal Output	PCR Enable	Enable		
elay Control	IP Address	239 239 239 1	•	
CR Control	UDP Port Number			
PIP Control		1,234	(1 10 65539)	
Notify	RTP Mode	Enable	•	
	PCR Input Control			
	SFP			
	SFP Port	SFP 1		
	PCR PID	256		
	IP Address	239,239,239,1		
	UDP Port Number	1,234	(16 6553)	
	PCR Presence			
	Time Reference			
	Time Reference Lock Enable	Enable	•	
	Jitter Tolerance	10,000	au (2000) as City	
		Sync Now		

Figure 5-10 : WebEASY<sub>®</sub> - PCR Control

#### 5.10.1. PCR Output Control

PCR Output PID: This parameter allows the user to set the time reference PCR PID.
PCR Enable: This parameter allows the user to Enable/Disable the PCR generation.
IP Address: This parameter allows the user to set the PCR Multicast Address.
UDP Port Number: This control allows the user to set the port number for UDP traffic.
RTP Mode: This parameter allows the user to Enable/Disable the PTR header.

#### 5.10.2. PCR Input Control

PCR PID: This parameter allows the user to set the time reference PCR PID.
IP Address: This parameter allows the user to set the PCR Multicast Address.
UDP Port Number: This control allows the user to set the port number for UDP traffic.
PCR Presence: This parameter displays if there is a PCR detected.

#### 5.10.3. Time Reference

Lock Enable: This parameter allows the user to enable/disable time reference lock.Jitter Tolerance: This parameter allows the user to set the jitter tolerance.Sync Now: This parameter allows the user to sync the time reference.



#### 5.11. PTP CONTROL

EVERIZ 570EMR-AG-HUB C Refresh	😋 Auto Refresh 👲 Apply 🎍 Dynamic Appl	y 🏟 Upgrade	Logou
Menu	PTP Control		
System			
Product Features	PTP Control		
Signal Input	SFP Port	SFP 5	
IP Output (S302M)			
IP Output (AES67)	Status	Absent	
IP Input (S302M)	Domain Number	50	
IP Input (AES67)	Priority 1	255	
Signal Output	Priority 2	255	
Delay Control	Offset Seconds Tx	0	(-2147480647 to 2147480647)
PCR Control	Offset Nano Seconds Tx	0	(-2147482647 to 2147483647)
PTP Control	Offset Seconds Rx	0	(-2147483647 to 2147483647)
Notify	Offset Nano Seconds Rx	0	(-2147483647 to 2147483647)
	Offset Micro Seconds Tx 48 K	-805	(-2147483647 to 2147483647)
	Offset Micro Seconds Rx 48 K	-11,100	(-2147483647 to 2147483647)
	RTP Timestamp		
	LINK		
	1, 2 3 4 5 6 7 8 9	10	
		Jam Enable	

Figure 5-11 : WebEASY<sub>®</sub> - PTP Control

PTP is used to distribute time and timebase to every device in the system. Senders mark each packet of video, audio or ANC with an "RTP Timestamp" that indicates the "sampling time" (or equivalent). Receivers compare these timestamps in order to properly align the different essence parts to each other.

#### 5.12. NOTIFY

STOEMR-AG-HUB C Refresh	😋 Auto Refresh 👲 Apply 🎍 Dynamic Apply	🍄 Upgrade	Logo
Aenu	Notify		
System			
Product Features	Temperature		그는 것 같아요. 것 그 것 같아요. 그것 같아.
Signal Input			
P Output	TRAP Temperature Threshold	85 (-100	1 to 100) degree
P Input	Board Notify		에는 방법에는 동안을 다 가장에 가장되는 것이 같아.
ignal Output			
elay Control		Board Trap	Board Fault Present
CR Control	Temperature	True 🗸	
TP Control	Ethernet Fault		
lotify			
		Ethernet Trap	Ethernet Fault Present
	Port Link Status SFP1	True 🗸	
	Port Link Status SFP2	True 🗸	
	Port Link Status SFP3	True 🗸	
	Port Link Status SFP4	True 🗸	
	Input Signal Fault		
		Signal Trap	Signal Fault Present
	LINK1 Signal	True 🗸	
	LINK2 Signal	True 🗸	
	LINK3 Signal	True 🗸	
	LINK4 Signal	True 🗸	
	LINK5 Signal	True 🗸	
	LINK6 Signal		
	LINK7 Signal	True 🗸	
	LINK8 Signal	True 🗸	

Figure 5-12 : WebEASY $_{\ensuremath{\mathbb{R}}}$  - Notify



# 6. APPENDIX

**Real-Time Transport Protocol (RTP):** The use of RTP is recommended as it provides services such as time stamping, sequence numbering and delivery monitoring which can be beneficial for real-time delivery systems.

**Time To Live (TTL):** TTL is a mechanism that limits the life span of data in a network. Using the Multicast IP protocol, the TTL value indicates the scope or range in which a packet may be forwarded. By convention:

- 0 is restricted to the same host
- 1 is restricted to the same subnet
- 32 is restricted to the same site
- 64 is restricted to the same region
- 128 is restricted to the same continent
- 255 is unrestricted

**Type of Service (ToS):** The ToS field could specify a datagram's priority and request a route for lowdelay, high-throughput, or highly-reliable service. Based on these ToS values, a packet would be placed in a prioritized outgoing queue or take a route with appropriate latency, throughput, or reliability. If the network doesn't support ToS, use zero as default.

**Program Clock Reference (PCR):** Synchronization of the Receiver System Time Clock (STC) with the Transmitter STC depends on transmitting PCRs through a constant-delay portion of the system. Thus, PCRs are inserted following the encoder buffer and extracted before the receiver buffer. PCRs are inserted with a maximum interval of 100ms.

**Packet Time (AES67):** Packet time is the real-time duration of the media data contained in a media packet. Given the sampling rate and packet time, the number of samples per packet can be calculated. Short packet times allow for lower latency but introduce overhead and high packet rates that may overtax some devices or networks. Long packet times imply higher latency and require additional buffering which may not be available on memory-constrained devices.

Packet time is determined by the sender and negotiated through connection management. Senders shall not change packet time for the duration of a session. Receivers may assume that packet time does not change for the duration of a session. To enable interoperation with standard RTP implementations, receivers should not rely on the presence or accuracy of any packet time description. Receivers should be able to determine packet time based on the timestamps in received packets.



End of Document