MIO–CCE–4K/3G

SMPTE ST 2110/4K/3G/HD/SD Closed Caption Encoder with Media–to–IP Streaming

User Manual

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Version 1.1, June 2022

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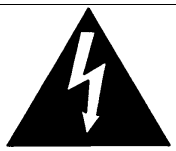
IMPORTANT SAFETY INSTRUCTIONS

	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.

REVISION HISTORY

REVISION	DESCRIPTION	DATE
1.0	First Release	Dec 2021
1.1	Added Show Selection Namedropper Function	June 2022

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Figures

1. OVERVIEW

The MIO–CCE–4K/3G is a closed caption encoder for SMPTE ST 2110/4K/3G/HD/SD–SDI video signals that can be housed in any SCORPION frame. MIO modules provide native support for numerous captioning interfaces, such as captioning over dial–up phone line, captioning over IP and captioning over serial RS–232/RS–422.

MIO–CCE–4K/3G supports many advanced applications such as on–screen display for real–time monitoring of the encoded closed captions. Applications such as “translating” captions from CEA–608 to CEA–708 or “transcoding” CEA–608 between SD line–21 and HD VANC carriage are natively supported.

The onboard storage may be used for both caption file capture and insertion. With the capture function, the unit can record and store captions that are being actively encoded or already present on the incoming video. The stored files may be retrieved from storage and are useful in cases such as editing/correcting captions from existing content, avoiding complete re–authoring, or for verifying compliance. The insertion function allows files in storage to be directly encoded to video, convenient where an external transfer station is not available.

Taking advantage of the availability of IP connectivity, the MIO–CCE–4K/3G is able to generate a low latency, low bandwidth media–over–IP stream from the embedded tracks in the incoming video. This media may be streamed to the remote captioner, facilitating a complete bi–directional link and negating the need for a POTS/dialup connection.

The MIO–CCE–4K/3G is VistaLINK® PRO–capable, which allows for control and configuration via Simple Network Management Protocol (SNMP). This offers the flexibility to manage the module status monitoring and configuration from SNMP enabled control systems such as Evertz’ VistaLINK® PRO locally or remotely.

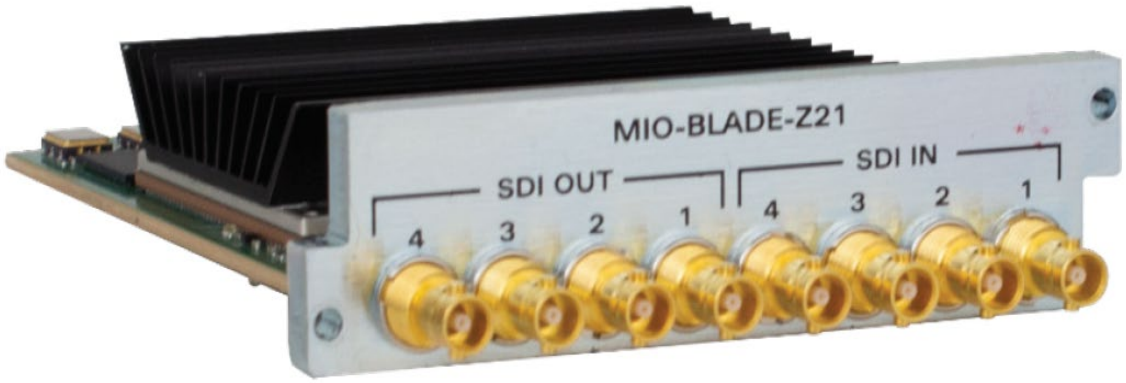

Figure 1-1 : MIO-CCE-4K/3G

1.1. FEATURES & BENEFITS

- Simultaneously encodes new CEA–608 and CEA–708 captions onto 4K/3G/HD/SD–SDI video
- Built–in CEA–608 and CEA–708 closed caption decoders
- Closed caption shifting to avoid overwriting emergency alert messages
- Support for SMPTE ST 334M/ CEA–708 and CEA–608 captions onto 4K/3G/HD/SD–SDI video
- Supports control and insertion of captions over Ethernet TCP/IP, RS–232/RS–422 serial and telephone modem

- Save or insert captions directly to or from a file (CEA–608, Procap, SCC, CDP) on a local storage and are accessible via FTP

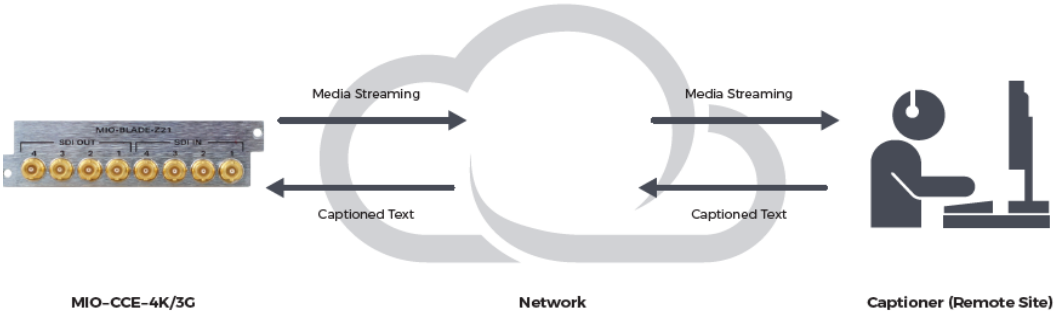

Figure 1-2 : Sample Application : Captioning and Streaming Media Over IP

1.2. HOW TO USE THIS MANUAL

This manual is organized into 7 chapters: Overview, Installation, Technical Specifications, WebEASY, VistaLINK® Configuration, Serial Protocol, Troubleshooting, and Glossary.

Chapter 1 provides a brief overview of the MIO-CCE-3G operation and features.

Chapter 2 provides a detailed description of the rear panel connectors and how the MIO-CCE-3G should be connected into your system.

Chapter 3 provides technical information such as the specifications.

Chapter 4 provides information regarding WebEasy® configuration and settings.

Chapter 5 provides information about the serial command protocol used for external devices to communicate with the MIO-CCE-3G.

Chapter 6 provides a brief troubleshooting guide and answers to frequently asked questions. Consult this chapter before you call Evertz technical support.

Chapter 7 contains a glossary that defines concepts and terms used throughout the remainder of the manual. We highly recommend taking the time to become familiar with the terms and concepts described here before proceeding into the rest of the manual.

This symbol is intended to alert the user to important operating instructions.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important safety related operating and maintenance (Servicing) instructions in this manual.

2. INSTALLATION

2.1. REAR PANEL

Figure 2-1 provides the user with an illustration of the MIO–CCE–4K/3G module. The MIO-CCE-4K/3G is a dual-slot module and will require two available slots in the Scorpion frame.

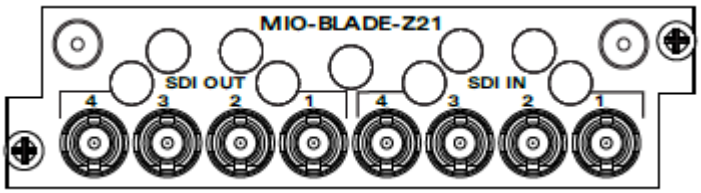

Figure 2-1: MIO-CCE-4K/3G Module I/O

2.1.1. Program Video Inputs (12G/3G/HD/SDI Input1-4)

The SDI Inputs 1-4 are BNCs compatible with SMPTE ST 2081 (12G-SDI), SMPTE ST 424M (3G), SMPTE ST 292M (1.5G), SMPTE ST 259M (270Mb). These inputs support upstream SDI video and upstream SDI video with caption information.

2.1.2. Program Video Outputs (12G/3G/HD/SDI OUT 1-4)

The SDI Outputs 1-4 are BNCs compatible with SMPTE ST 2081 (12G-SDI), SMPTE ST 424M (3G), SMPTE ST 292M (1.5G), SMPTE ST 259M (270Mb).

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3. TECHNICAL SPECIFICATIONS

3.1. ELECTRICAL INPUTS

Reclocked Standards:
SMPTE ST 2081 (12G-SDI)
SMPTE ST 424M (3G)
SMPTE ST 292M (1.5G)
SMPTE ST 259M (270Mb),

Connector: HD-BNC
Impedence: 75Ω (nominal)
Equalization: Automatic up to 80m @3G,
100m @ 1.5G, 25-m @ 270Mb
with Belden 1694A (or equivalent)

Return Loss: >15dB up to 1.5GHz,
>10dB up to 3GHz,
>7dB up to 6GHz,
>4dB up to 12GHz

3.2. ELECTRICAL OUTPUTS

Connector: HD-BNC
Impedence: 75Ω (nominal)
Signal Level: 800mV (nominal)
DC Offset: 0V +/- 0.5V
Rise and Fall Time: Reclocked SFPs only
12G: <45ps
3G/HD: <135ps
SD: <900ps
Overshoot: <10% of amplitude (reclocked SFPs only)
Alignment Jitter: Reclocked SFPs only;
<0.2UI to 1.485GB/s,
<0.3UI to 2.97GB/s,
<0.3UI to 12GB/s

3.3. PHYSICAL

Power Consumption: 20W
Requires: Dual-slot MIO
Operating Temp: 0-70°C

3.4. ORDERING INFORMATION

MIO-CCE-4K SMPTE ST 2110/4K/3G/HD-SDI dual–slot MIO module for use in any SCORPION chassis. Includes closed captioning encoder software with non–media streaming; requires additional MIO modules for modem and serial, requires +Audio and/or Video (not available at time of writing) license to add media streaming.

MIO-CCE-3G SMPTE ST 2110/3G/HD/SD–SDI dual–slot MIO module for use in any SCORPION chassis. Includes closed captioning encoder software with non–media streaming; requires additional MIO modules for modem and serial, requires +Audio and/or Video (not available at time of writing) license to add media streaming.

3.4.1. Ordering Options:

+Audio Media streaming license enabling media (audio) over IP streaming
+Video Media streaming license enabling media (video) over IP streaming (not available at time of writing)

MIO-CCE-AUX-IO Dual-slot MIO module adding support for up to 8x GPIO and 3x serial RS-232/RS-422 data I/O
MIO-MODEM Dual-slot MIO module adding support for modem connections

3.4.2. Enclosures

Scorpion-6 Scorpion miniature frame, holds 6x single – or 2x dual-slot modules
Scorpion-X18 Scorpion miniature frame, holds 18x single - or 8x dual-slot modules

4. WEBEASY® CONFIGURATION

The MIO-CCE-4K/3G can be configured using the Evertz Web Interface. WebEASY® operates using Ethernet and SNMP control protocols.

Login

After the MIO module has been installed into the Scorpion unit, and configured with the required network address (See appropriate Scorpion Manual), it can be operated and controlled over a web browser. Type the IP address of the control port of MIO-CCE-4K/3G module into your web browser.

Note: Computer must be on same subnet in order to have communication with the module.

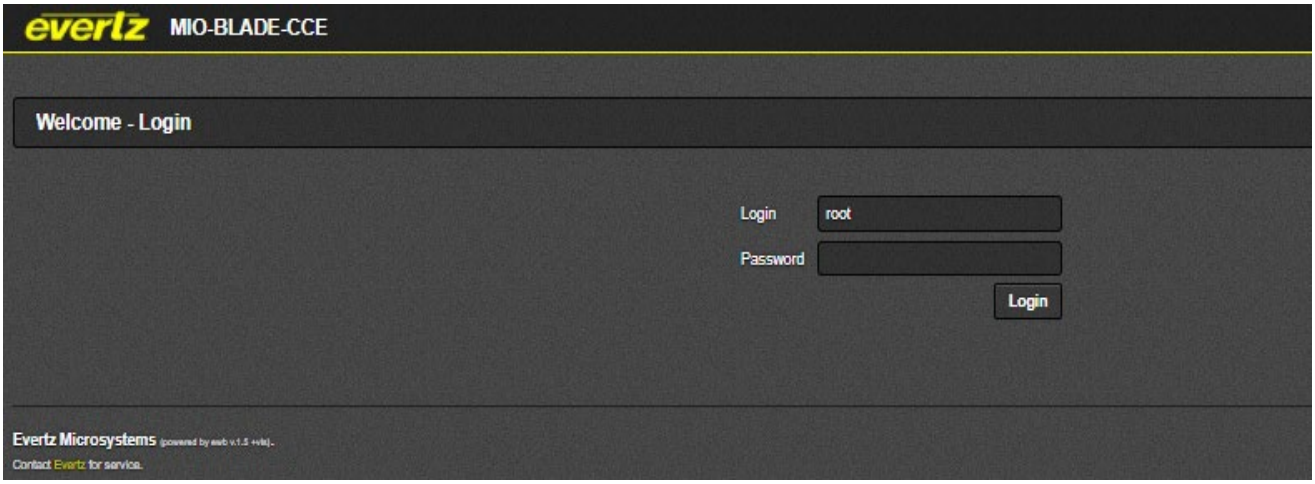


Figure 4-1 : WebEASY® - Login Menu

Default login and password is “customer”.

After logging in, the navigation bar shown in Figure 4-2 is used to navigate to the device configuration menus that will be discussed in the following sections throughout chapter 4.

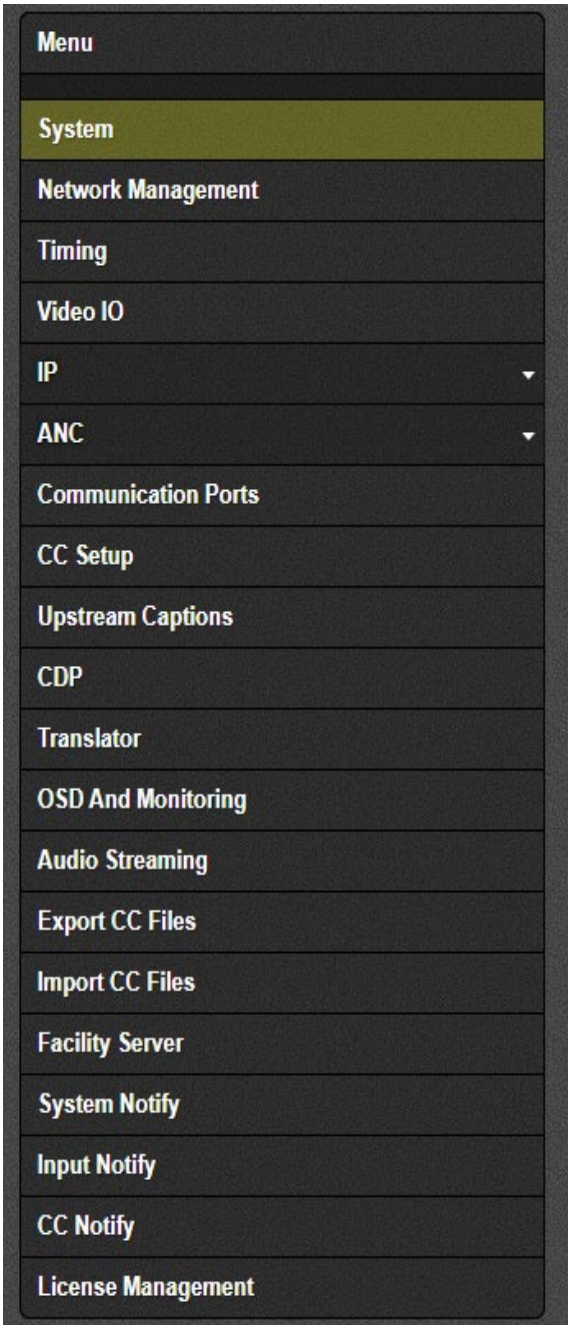


Figure 4-2 : WebEASY® - MIO-CCE-4K/3G Navigation Bar

4.2. SYSTEM

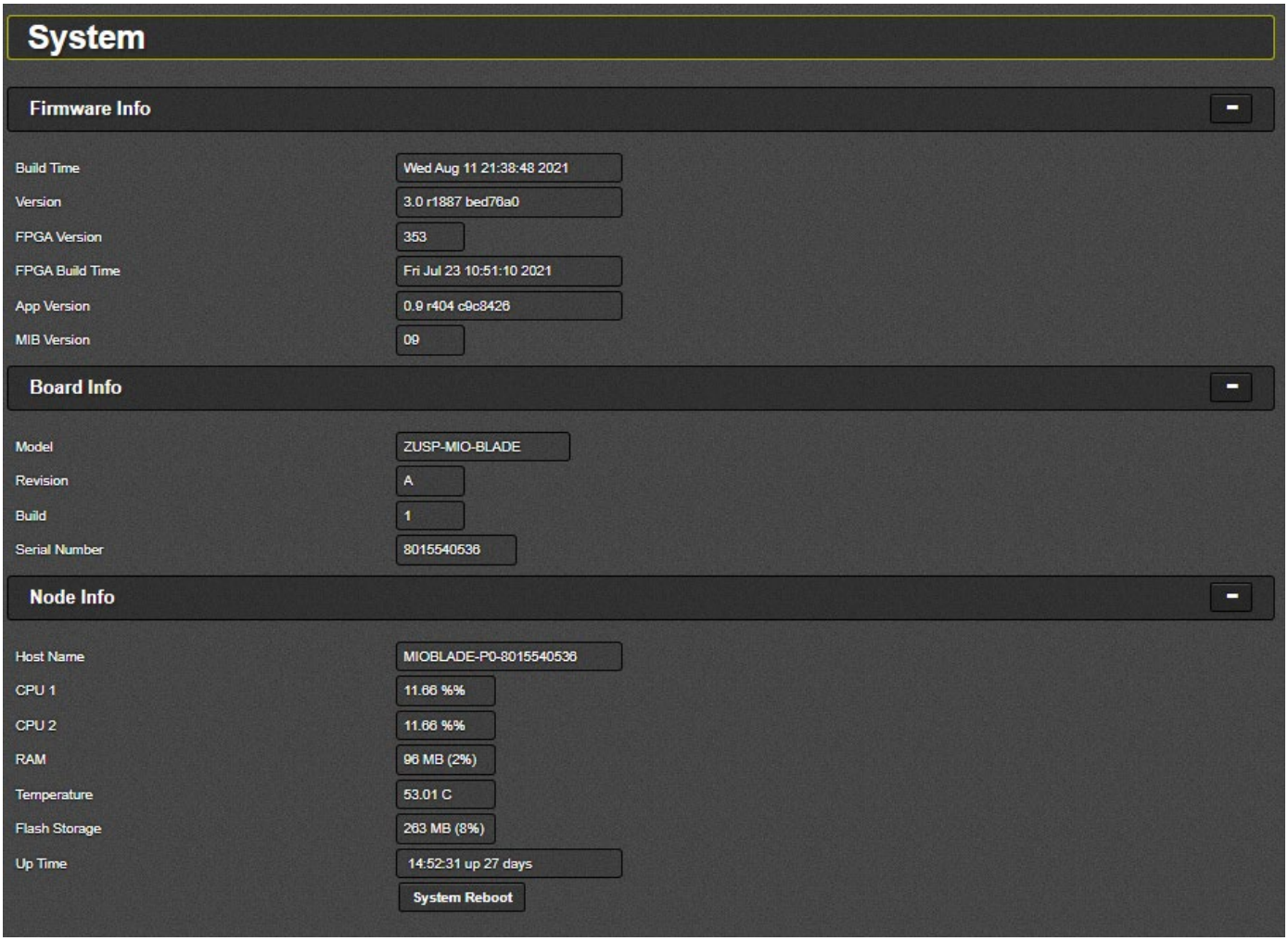


Figure 4-3 : WebEASY® - System

4.2.1. Firmware Info

The firmware info section displays build time and version for the firmware, FPGA, APP & MIB.

4.2.2. Board Info

The board info section displays the model, revision, build and serial number of the board that the MIO-CCE-4K/3G is running on. The model, revision and build refer to the model of the board are MIO-BLADE hardware that the MIO-CCE-4K/3G is running on. The serial number for this specific device is also displayed here.

4.2.3. Node Info

The node info section displays detailed information about the functioning of the hardware.
This information includes host name, CPU Usage for CPU cores 1&2, RAM usage, current CPU temperature, flash storage capacity and up-time.

System Reboot: This control will restart the MIO-CCE-4K/3G.

4.3. NETWORK MANAGEMENT

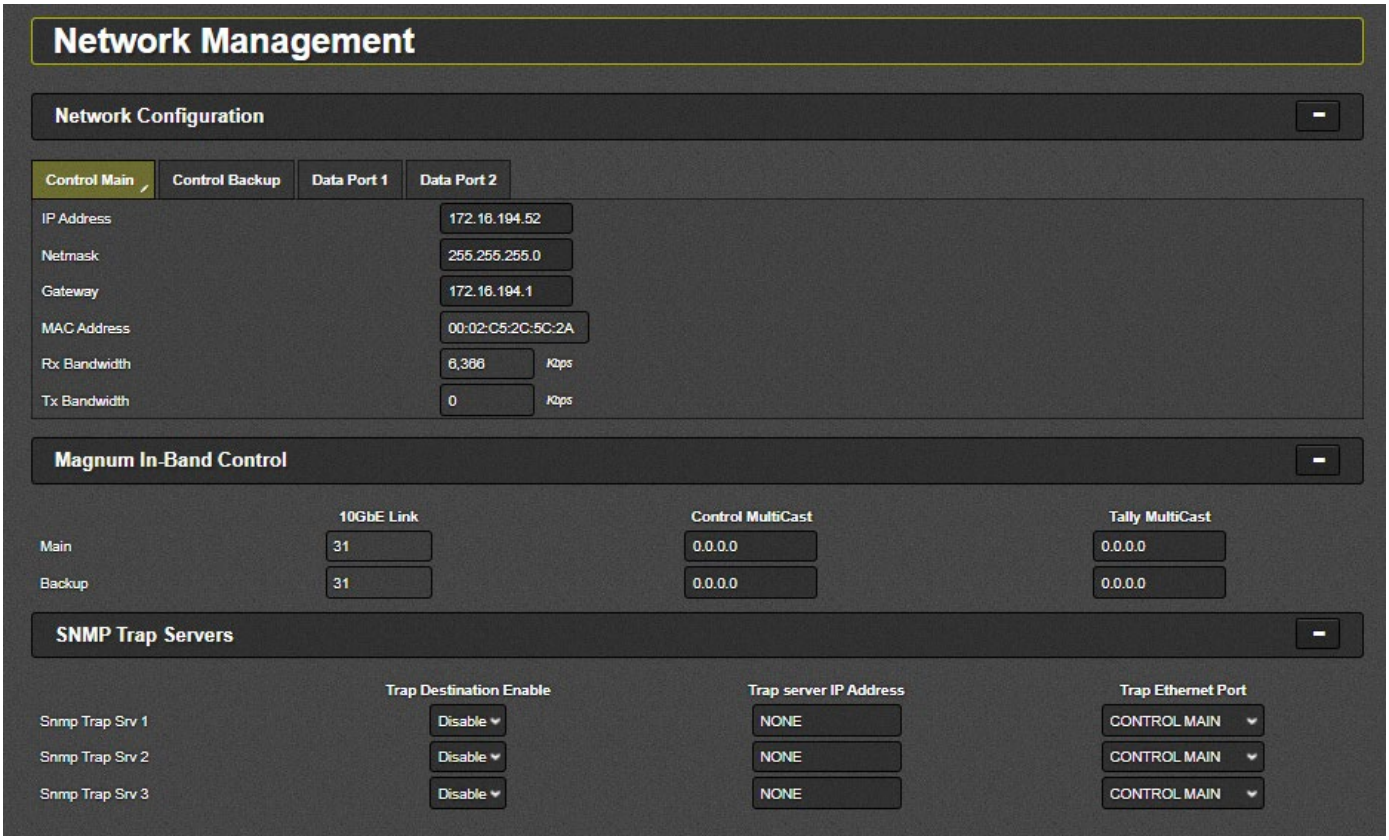


Figure 4-4 : WebEASY® - Network Management

4.3.1. Network Configuration

The network configuration section is used to configure network settings for the *Control Main, Control Backup, Data Port 1 & Data Port 2.*

IP Address: Use this field to set the IP addresse of the selected network port, displays current IP if one has been set.
Netmask: Use this field to set the netmask of the selected port, displays current netmask if one is set.
Gateway: Use this field to set the network gateway of the selected network port, displays current gateway if set.
MAC Address: This field displays the MAC address of the currently selected network port.
Rx Bandwidth: This field displays the current receive bandwidth in Kbps of the selected network port.
Tx Bandwidth: This field displays the current transmit bandwidth in Kbps of the selected network port.

4.3.2. Magnum In-Band Control

This section displays the Magnum Control & Tally Multicast server IP for the main and backup Magnum server.

4.3.3. SNMP Trap Servers

This section contains controls for connecting for setting trap server for alarms, with the possibility to connect up to three trap servers.

Trap Destination Enable: This control will enable or disable the designated trap server.
Trap Server IP Address: This field allows the user to enter the IP address for the designated trap server.
Trap Ethernet Port: This control enables the user to select which network port is used to send alarm messages to the designated trap server.

4.4. TIMING

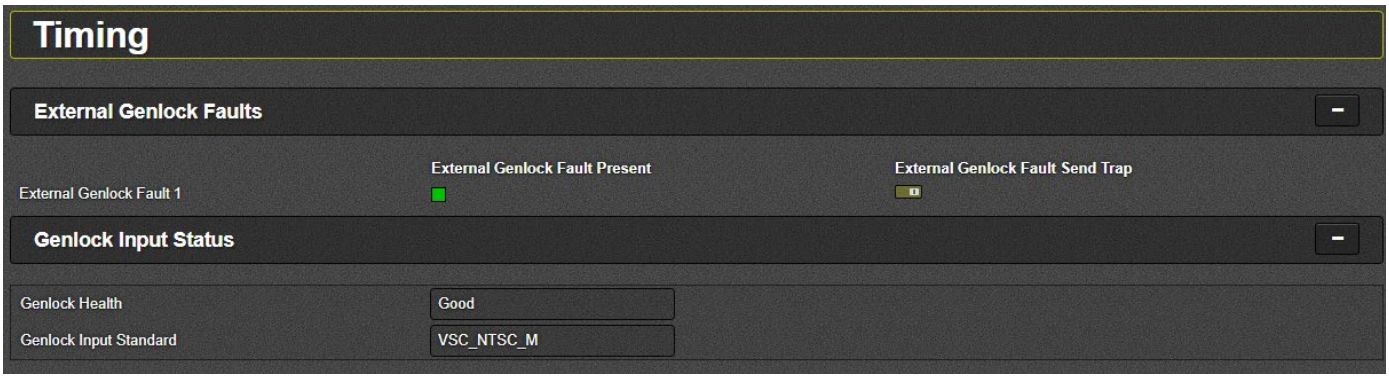


Figure 4-5: WebEASY® - Timing

4.4.1. External Genlock Faults

External Genlock Fault Present: This display will turn red if a genlock fault is detected, remains green if no genlock fault is found.
External Genlock Fault Send Trap: This slider control allows the user to enable sending a fault notice to the trap servers enabled in Section 4.3.3. Slide the control to the right to enable trap, slide to left to disable.

4.4.2. Genlock Input Status

Genlock Health: This section displays the current genlock health, this is based on load increasing and jam count not increasing.
Genlock Input Standard: This field displays the genlock input standard for the genlock input signal.

4.5. VIDEO IO

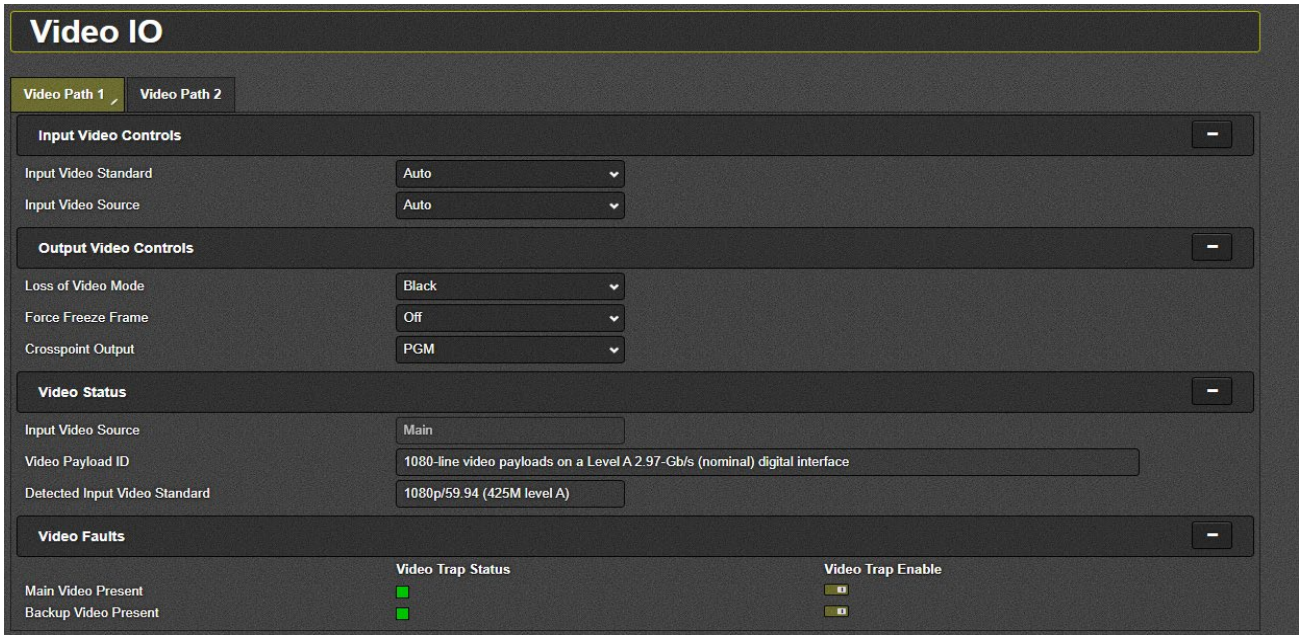


Figure 4-6 : WebEASY® - Video IO (Video Path 1)

4.5.1. Input Video Controls

Input Video Standard: The MIO-CCE-4K/3G supports the following video standards

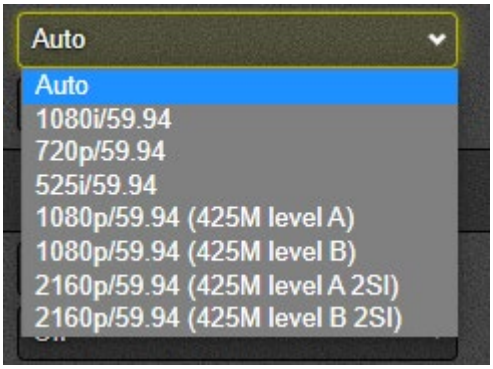


Figure 4-7: Input Video Controls

Input Video Source: The input video standard allows the user to select which input video channel from the following options.

Figure 4-8: Input Video Source

4.5.2. Output Video Controls

Loss of Video Mode: Set the behavior of the video stream upon input loss. Options are black screen, blue screen and freeze image.

Figure 4-9: Loss of Video Mode

Force Freeze Frame: Enable or disable the capacity to force freeze frame.

Figure 4-10 : Force Freeze Frame

Crosspoint Output: Set the output type when crosspoint input video is selected. Options are Program (PGM) & Monitor (MON).

Figure 4-11: Crosspoint Output

4.5.3. Video Status

This section displays the input video source, video payload ID, and detected input video standard for the current video signal.

4.5.4. Video Faults

Video Trap Status: This display will turn red if a genlock fault is detected, remains green if no genlock fault is found.
Video Trap Enable: This slider control allows the user to enable sending a fault notice to the trap servers enabled in Section 4.3.3. Slide the control to the right to enable trap, slide to left to disable.

4.6. IP

The IP menu is split into IP Input and IP Output. Use the down arrow button beside the IP menu option on the side navigation bar to view the IP input and IP output menu options.

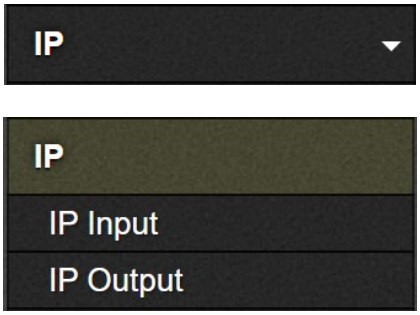


Figure 4-12: IP

4.7. IP INPUT

Use the IP input menu to monitor & set IP settings for Video IP (not used at time of writing), ANC IP (not used at time of writing) and GPIO/Serial to IP (if enabled, see ordering options for MIO-CCE-AUX-IO).

Settings for Video Path 1 or Video Path 2 are accessed separately by selecting the tab of the video path.

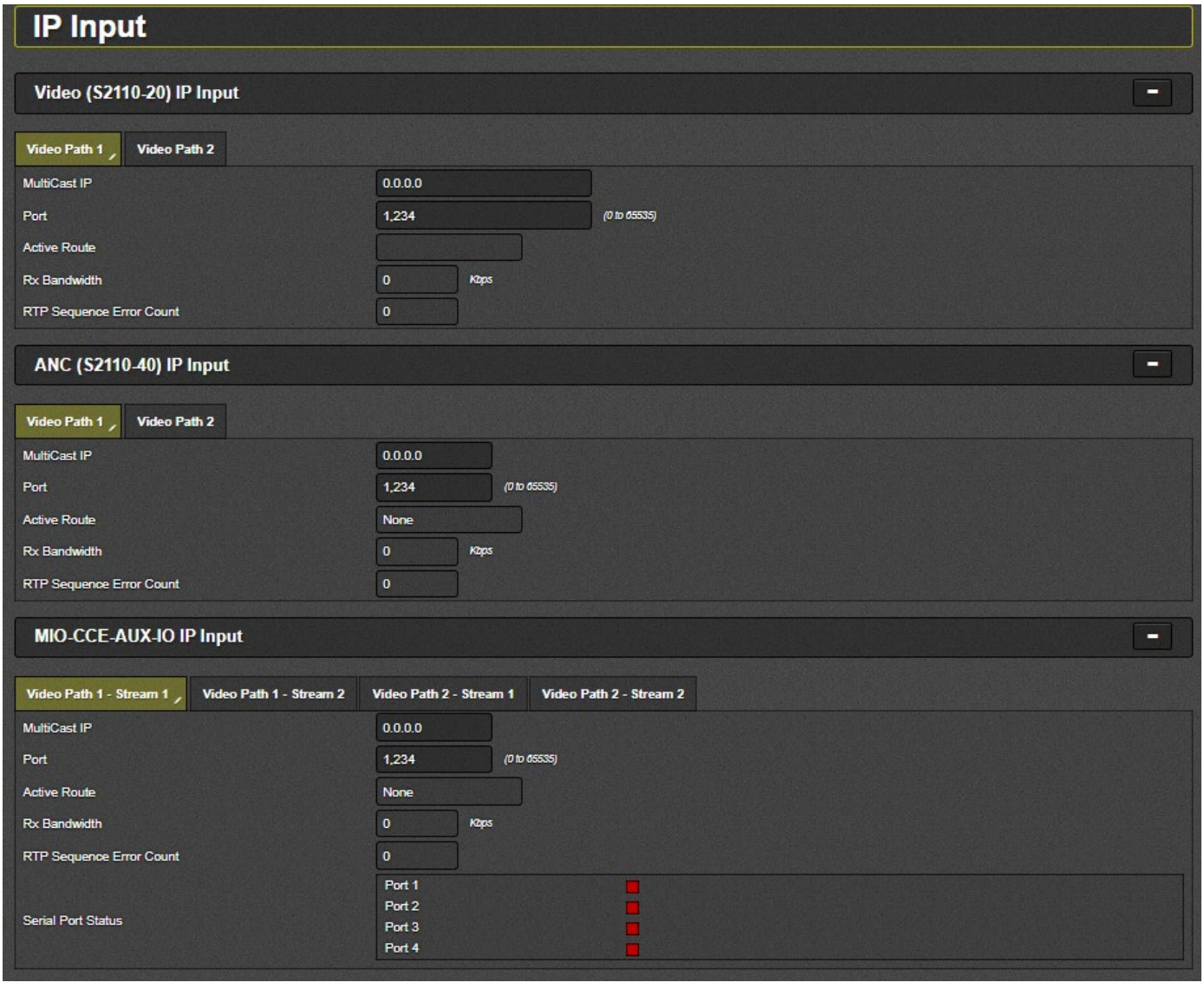


Figure 4-13 : WebEASY® - IP Input

4.7.1. Video (S2110-20) IP Input (not used at time of writing)

Multicast IP: Set the multicast IP address for video IP input.

Port: Set port for multicast IP address

Active Route: Displays the active route for video input.

Rx Bandwidth: Displays the Rx bandwidth for video IP input.

RTP Sequence Error Count: Displays a counter of RTP Sequence Errors.

4.7.2. ANC (S2110-40) IP Input (not used at time of writing)

MultiCast IP: Set the multicast IP address for ANC data input.

Port: Set the port for ANC input.

Active Route: Displays the active route for ANC input.

Rx Bandwidth: Displays bandwith being received for ANC input (in Kbps).

RTP Sequence Error Count: Displays the error count for RTP data packets.

4.7.3. Mio-cce-aux-io IP Input

(Available with MIO-CCE-AUX-IO enabled)

Select stream 1 or 2

Multicast IP: Set the multicast IP for serial/GPIO input to IP.

Port: Set the port for serial/GPIO to IP.

Active Route: Displays the active route for serial/GPIO stream.

Rx Bandwidth: Displays the bandwidth being received for serial/GPIO.

RTP Sequence Error Count: Displays the error count for RTP data packets.

Serial Port Status (Port 1-4): Displays current status of serial input signal, green indicates healthy signal red indicates error or unhealthy signal on that port.

4.8. IP OUTPUT

Use the IP output menu to monitor & set IP settings for Video IP (not available at time of writing), ANC IP (not used at time of writing) and GPIO/Serial to IP(if enabled, see ordering options for MIO-CCE-AUX-IO).

Settings for Video Path 1 or Video Path 2 are accessed separately by selecting the tab of the video path.

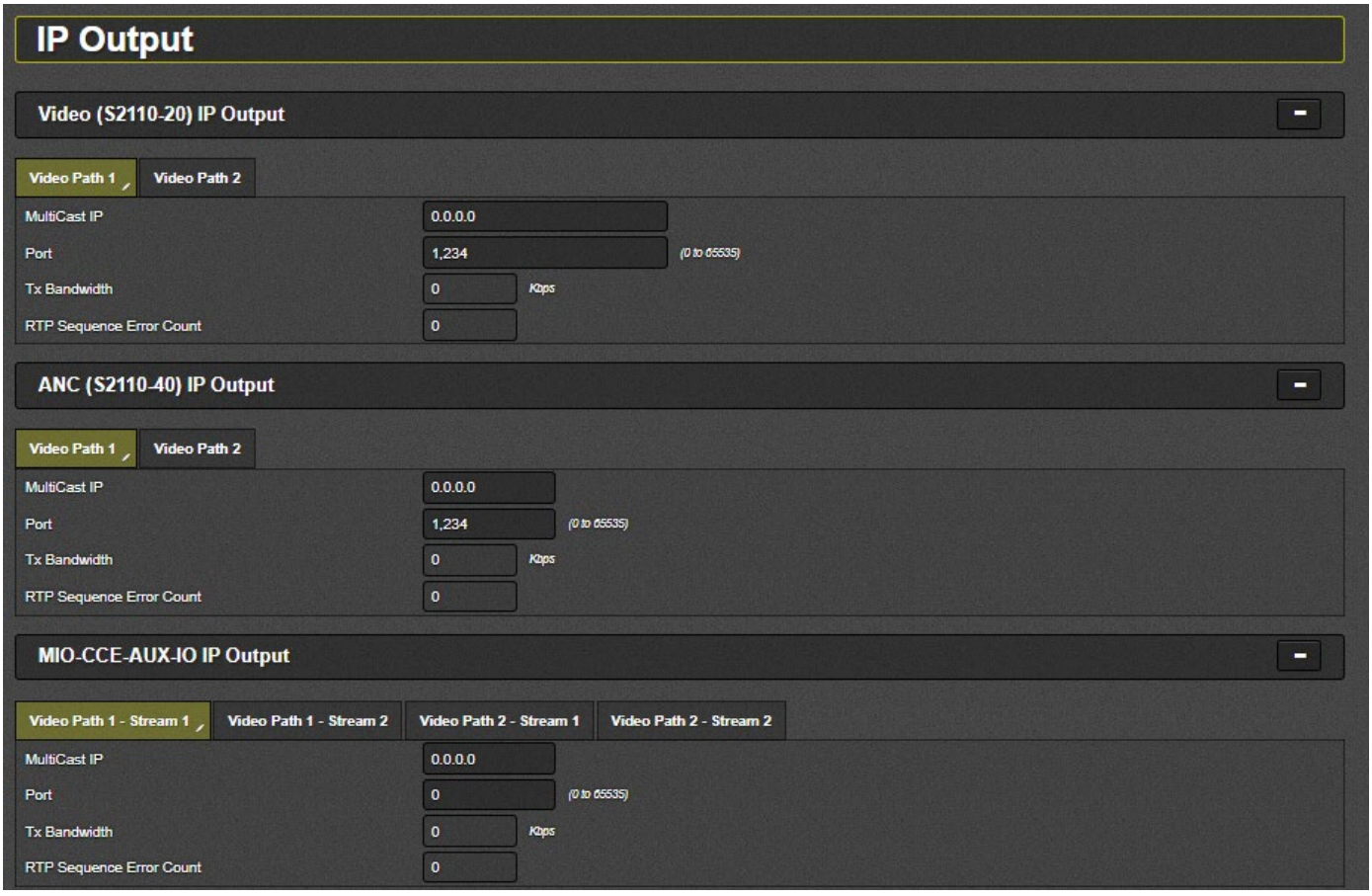


Figure 4-14 : WebEASY® - IP Output

4.8.1. Video (S2110-20) IP Output (not used at time of writing)

Multicast IP: Set the multicast IP address for video IP output.

Port: Set port for multicast IP address

Tx Bandwidth: Displays the tx bandwidth of video output in Kbps.

RTP Sequence Error Count: Displays a counter for RTP sequence errors.

4.8.2. ANC (S2110-40) IP Output (not used at time of writing)

MultiCast IP: Set the multicast IP address for ANC data output.

Port: Set the port for ANC output.

Tx Bandwidth: Displays bandwith being received for ANC output (in Kbps).

RTP Sequence Error Count: Displays the error count for RTP data packets.

4.8.3. MIO-CCE-AUX-IO IP Output

(Available with MIO-CCE-AUX-IO enabled)

Multicast IP: Set the multicast IP for serial/GPIO output to IP.

Port: Set the port for serial/GPIO to IP.

Tx Bandwidth: Displays the bandwidth being received for serial/GPIO.

RTP Sequence Error Count: Displays the error count for RTP data packets.

Serial Port Status (Port 1-4): Displays current status of serial input signal, green indicates healthy signal red indicates error or unhealthy signal on that port.

4.9. ANC

In order to access the ANC options, select the down arrow on the ANC menu to open the dropdown. The ANC menu contains pages for time code (+TC), WST teletext, namedropper (+NDE).

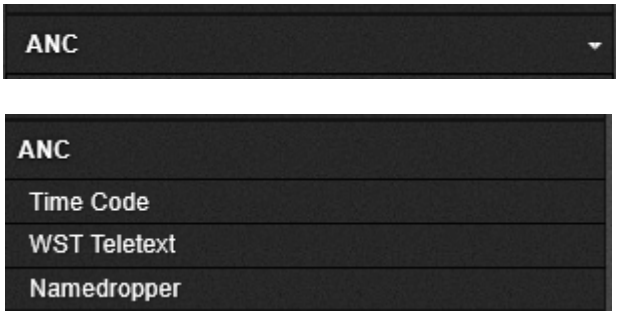


Figure 4-15: ANC

4.10. TIME CODE. (+ETC OPTION ONLY)

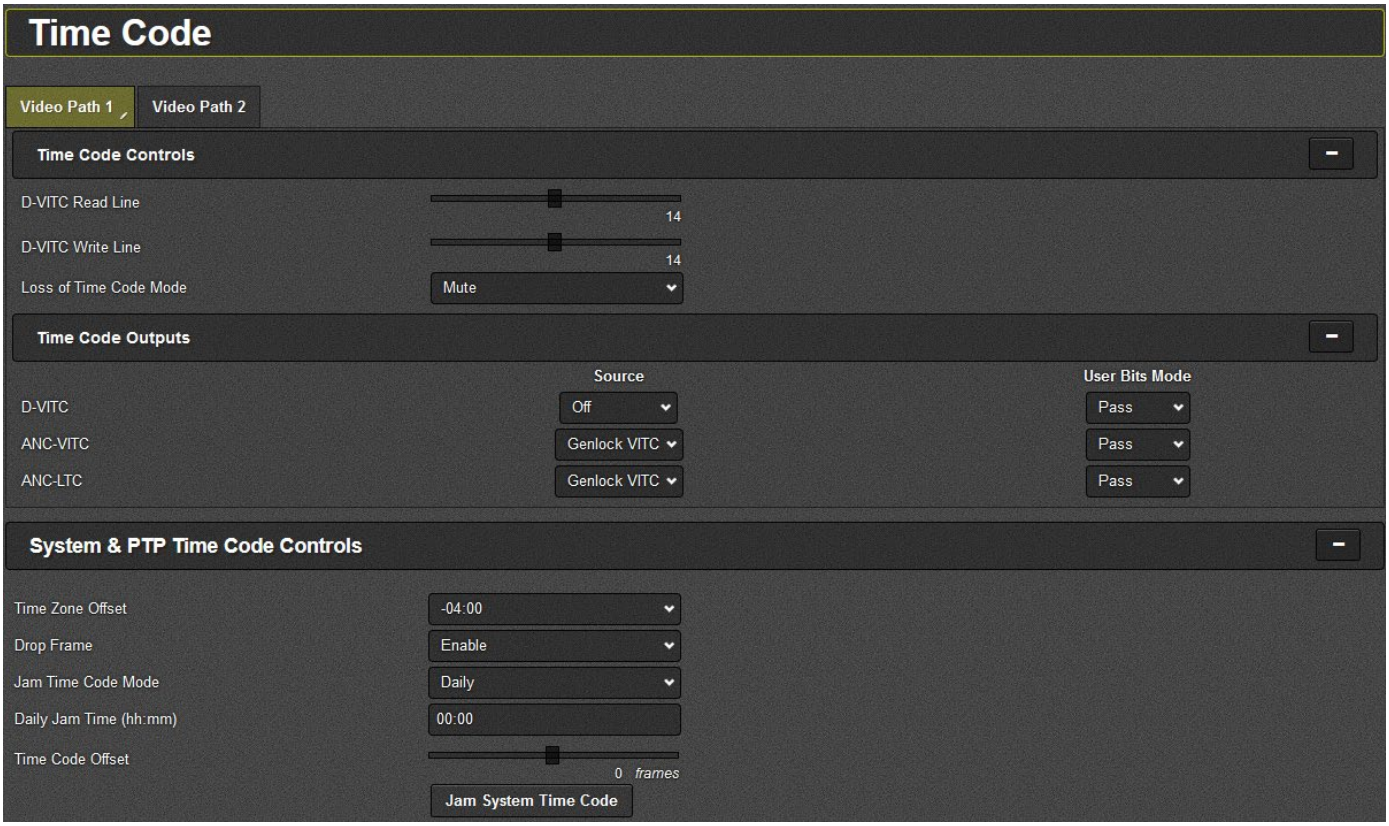


Figure 4-16 : WebEASY® - Time Code

4.10.1. Time Code Controls

D-VITC Read Line: This slider is used to select the ANC video line used for the D-VITC read line. (Lines 6-22)
D-VITC Write Line: This slider is used to select the ANC video line used for the D-VITC write line. (Lines 6-22)
Loss of Time Code Mode: Specifies the behavior of output time code when input time code is lost.

- Mute
- Run
- Hold

4.10.2. Time Code Outputs

For D-VITC, ANC-VITC & ANC-LTC
Source: Specifies the source of time code.

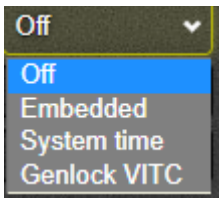


Figure 4-17: Time Code - Outputs

User Bits Mode: Selects the mode of processing on the output time code user bits. The data and time zone information is according to SMPTE-309M. “Video Delay” option embeds microseconds delay (32-bit value) into user bits.

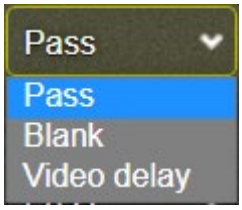


Figure 4-18: User Bits Mode

4.10.3. System & PTP Time Code Controls

Time Zone Offset: Selects time zone offset for time code output (+00:00 refers to GMT).

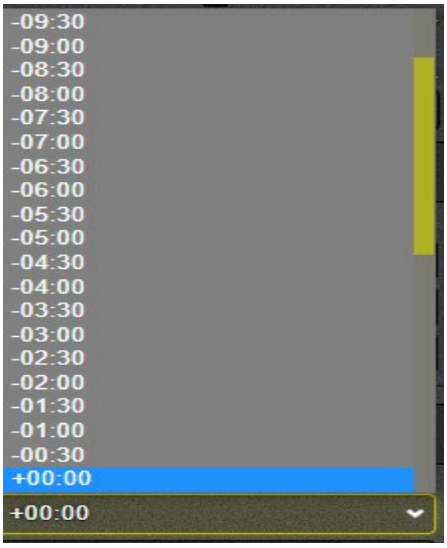


Figure 4-19: Time Zone Offset

Drop Frame: Enables or disables drop frame synchronization of

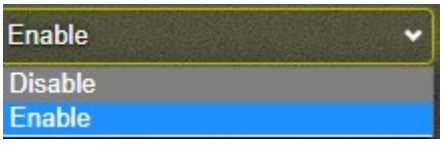


Figure 4-20: Drop Frame

Jam Time Code Mode: Selects a daily PTP time code jam to synchronize timing.

Figure 4-21: Jam Tide Code Mode

Daily Jam Time (hh:mm): Enter the time of day that PTP time code will be sent.

Jam System Time Code: Push PTP time code now.

Time Code Offset: Offset timecode by 'x' frames. Range of offset is -1000 frames to +1000 frames.

4.11. WST TELETEXT

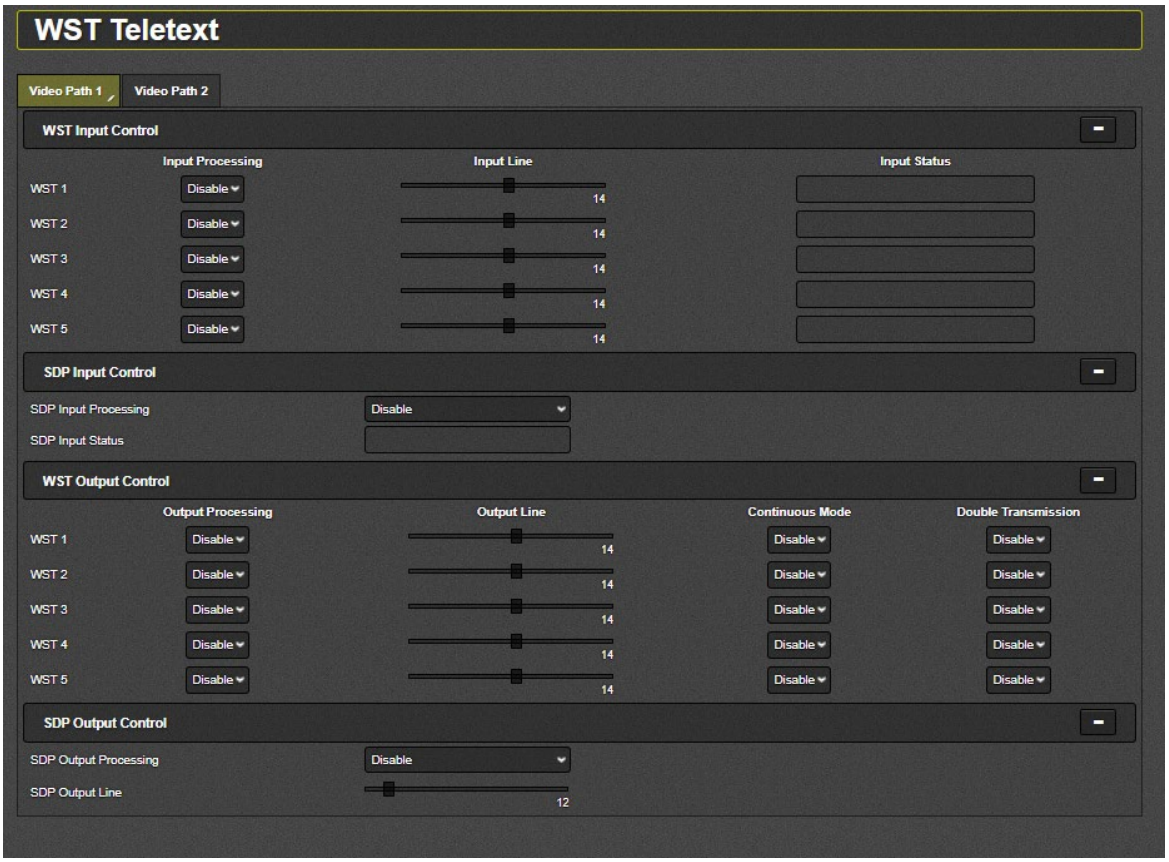


Figure 4-22 : WebEASY® - WST Teletext

4.11.1. WST Input Control

For WST 1-5

Input Processing: Select input processing for WST input. Select enable / disable or Newfor protocol for processing.

Figure 4-23 : WST Input Processing

Input Line: Selects the input line for the selected WST input (line 6-22).

Input Status: Displays the status for WST input

4.11.2. SDP Input Control

SDP Input Processing: Used to enable or disable SDP input processing

SDP Input Status: Displays SDP input status

Figure 4-24: SDP Input

4.11.3. WST Output Control

For WST 1-5

Input Processing: Enables/disables output processing for this WST output.

Output Line: Selects the input line for the selected WST output (line 6-22).

Continuous Mode: Enable/disable continuous ouput from selected WST.

Double Transmission: Enables/disables double transmission from this WST output.

Figure 4-25: WST Output

4.11.4. SDP Output Control

SDP Output Processing: Selects enable or disable of SDP output processing.

Figure 4-26: SDP Output

SDP Output Line: Selects the line to be used for embedding SDP data. *(From line 8 to 41)*

4.12. NAMEDROPPER (+NDE OPTION ONLY)

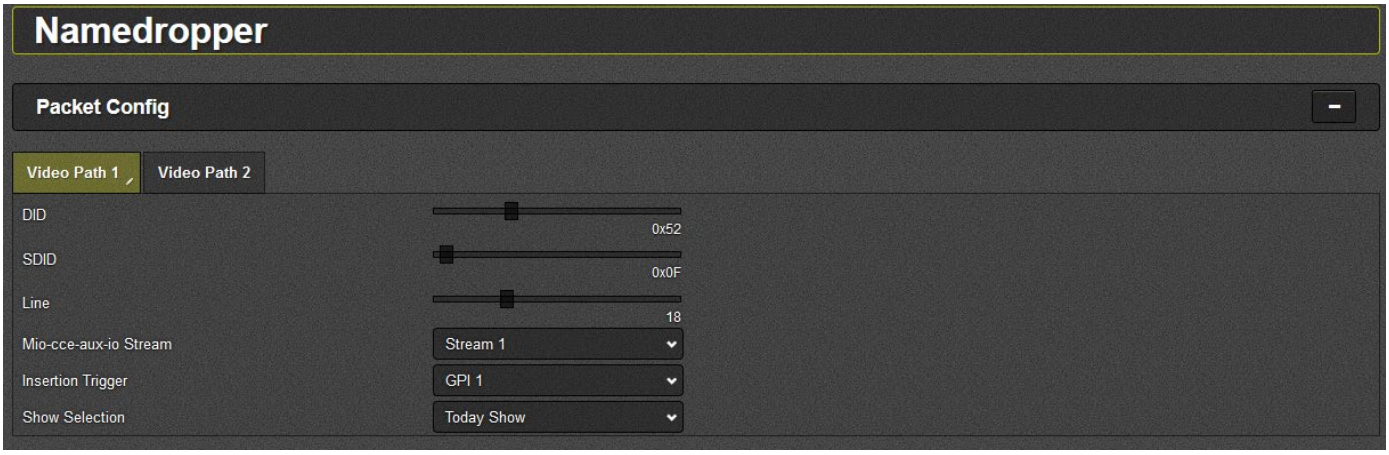


Figure 4-27 : WebEASY® - Namedropper

4.12.1. Packet Configuration

DID: This slider control allows the user to adjust the data identifier word for the namedropper packet data.

SDID: This slider control allows the user to adjust the namedropper secondary data identifier.

Line: This slider control allows the user to adjust the line for namedopper packets to be inserted

MIO-CCE-AUX-IO Stream: This control allows the user to select which available AUX-IO stream to insert namedropper data.

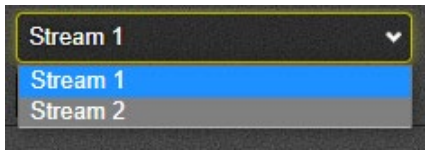


Figure 4-28: MIO-CCE-AUX-IO Stream

Insertion Trigger: This control is used to set the trigger for namedropper insertion. Selecting a GPI will set the MIO-CCE-4K/3G to insert namedropper on the configured stream & line when input is detected on that GPI.

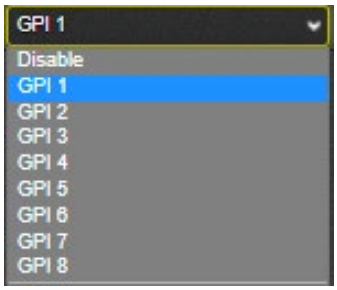


Figure 4-29: Packet Configuration

Show Selection: This control is used to choose the namedropper show selection for the selected video path.

Figure 4-30: Namedropper Show Selection

4.13. COMMUNICATION PORTS

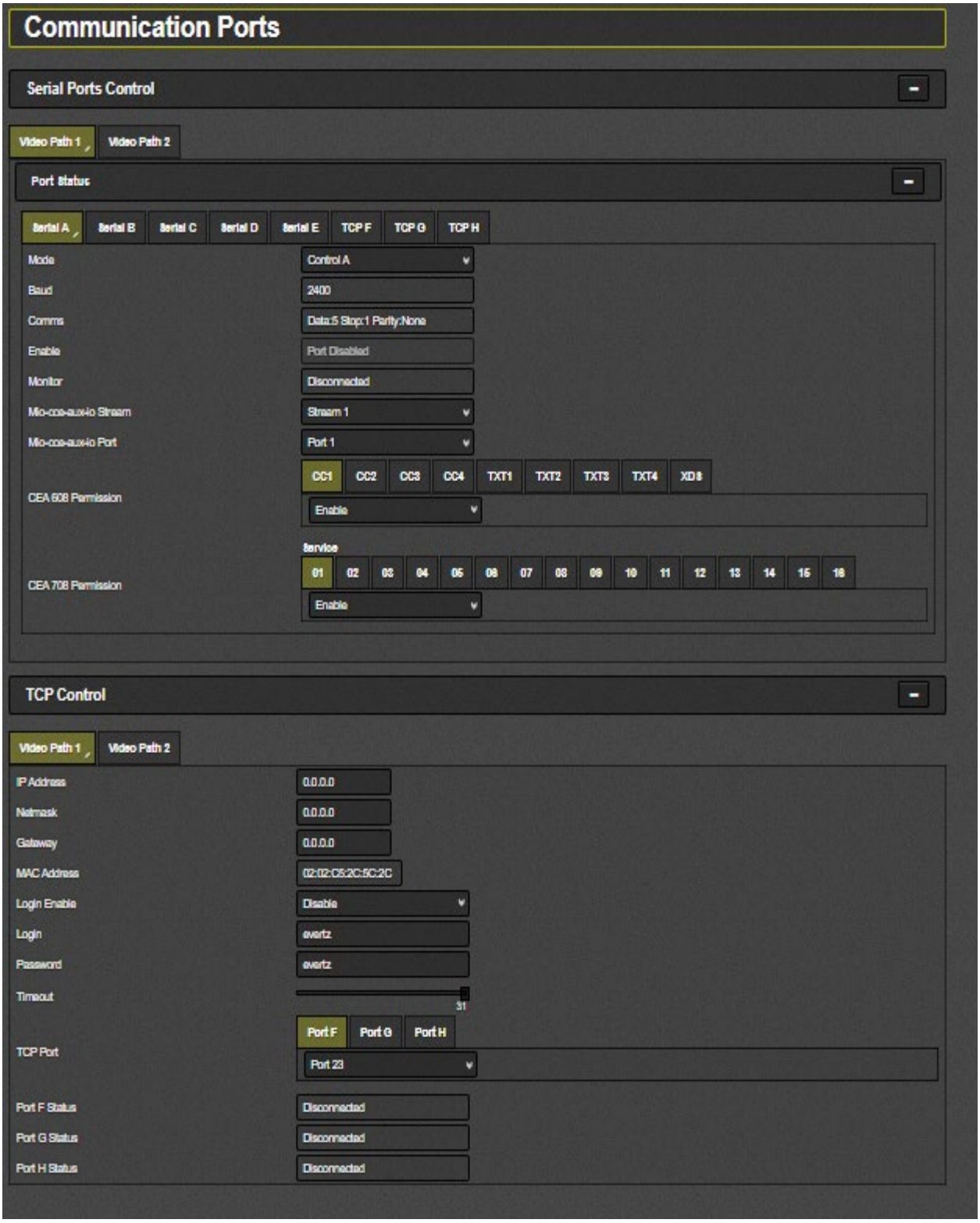


Figure 4-31 : WebEASY® - Communication Ports (Serial)

4.13.1. Port Status

(For Serial A-E)

When Serial A-Serial E are selected, menu will appear as shown in Figure 4-31.

Mode: This control modifies the output mode of the selected serial port.

Note that Echo of selected port is an invalid selection (ie. Echo Port A should not be selected for Serial A)

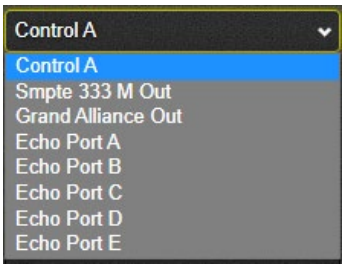


Figure 4-32: Port Status

Baud: Baud rate for serial ports A-E. Does not include telnet data from TCP F-H.

Comms: Displays serial port data bits, stop bits and parity bits.

Enable: Displays if selected port has been Enabled/Disabled.

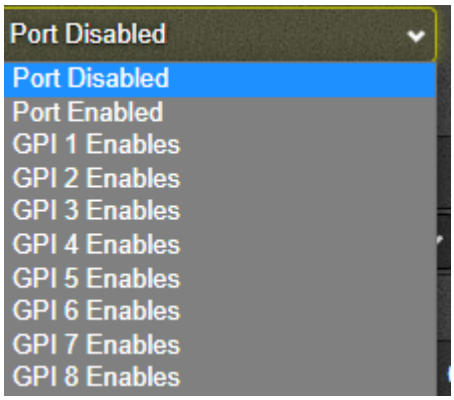


Figure 4-33: Enable

Monitor: Displays if port monitor is connected.

MIO-CCE-AUX-IO Stream: Stream ID setting for IP Rx/Tx mapping on this serial port. (Stream 1/Stream 2)

MIO-CCE-AUX-IO Port: Port ID setting for IP Rx/Tx mapping (Port 1-4)

CEA 608 Permission: This control enables or disables control CC permission for the selected serial port. Allows CEA 608 control permission for CC1-CC4, TXT1-TXT4 & XDS

CEA 708 Permission: This control enables or disables control service permission for the selected serial port. Allows control service control for services 01-16.

4.13.2. Port Status

(For TCP-F)
When TCP F – TCP H are selected, the Port Status menu will appear as shown below in Figure 4-33.

Figure 4-34 : WebEASY® - Communication Ports (TCP)

Mode: Select mode for selected TCP Port, options are Control A and Newfor.

Figure 4-35 : TCP Port Mode

Enable: This control sets the conditions for enabling or disabling the TCP port. Set Port Enabled / Port Disabled to manually enable or disable the port. Set GPI (1-8) Enables to trigger the selected TCP port to enable with input from selected GPI. Set Tcp disables to disable Tcp port

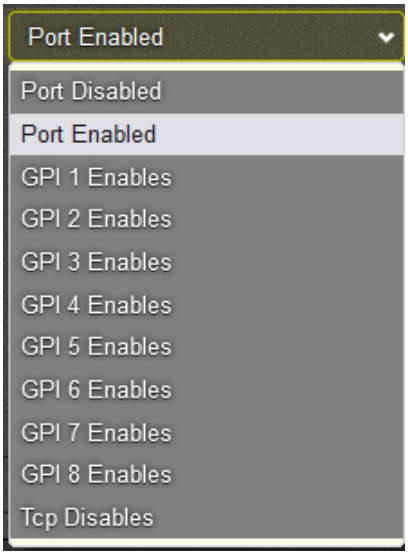


Figure 4-36 : TCP Port Enable

Monitor: This field displays the connection status of the selected TCP.

CEA 608 Permission: This control enables or disables control CC permission for the selected serial port. Allows CEA 608 control permission for CC1-CC4, TXT1-TXT4 & XDS

CEA 708 Permission: This control enables or disables control service permission for the selected serial port. Allows control service control for services 01-16.

4.13.3. TCP Control

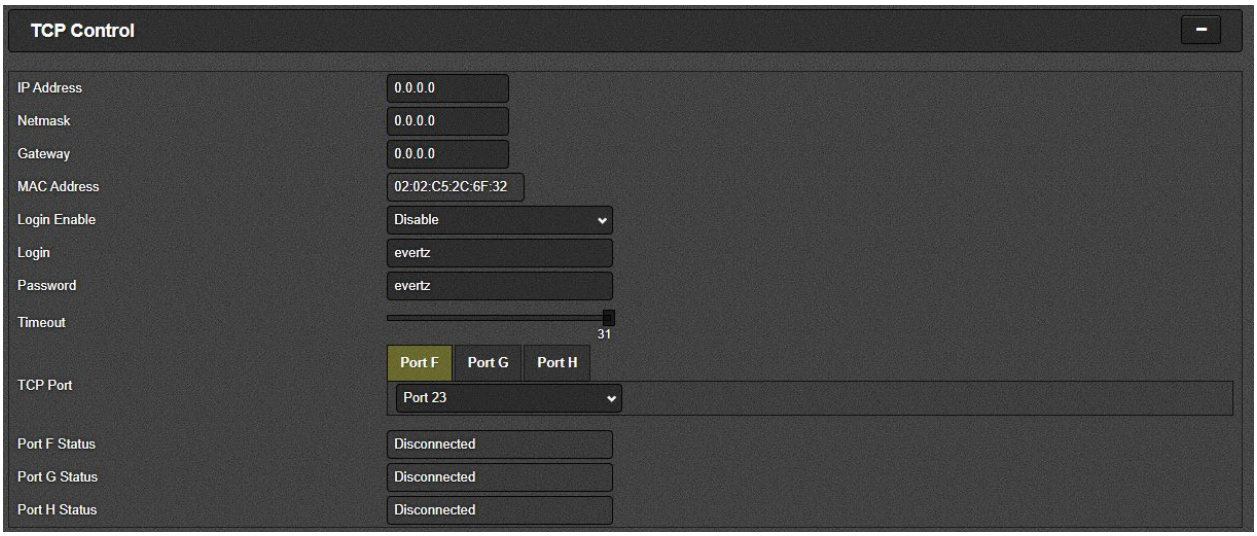


Figure 4-37: WebEASY® - Communication Ports – TCP Control

IP Address: Set IP address for TCP port.

Netmask: Set netmask address for TCP port.

Gateway: Set gateway address for TCP port.

Login Enable: This control is used to enable telnet login (default value is disable)

Login: Telnet login username. Only valid if login enabled

Password: Telnet login password. Only valid if login is enabled.

Timeout: Controls duration (minutes) of inactivity before telnet session is terminated (1 min to 31 minutes)

TCP Port: Assigns a TCP Port value to MIO-CCE device ports F, G & H. (Ports 23, 24 & 26 available)

Figure 4-38: TCP Port

Port (F-H) Status: Displays the status of TCP ports F-H.

4.14. CC SETUP

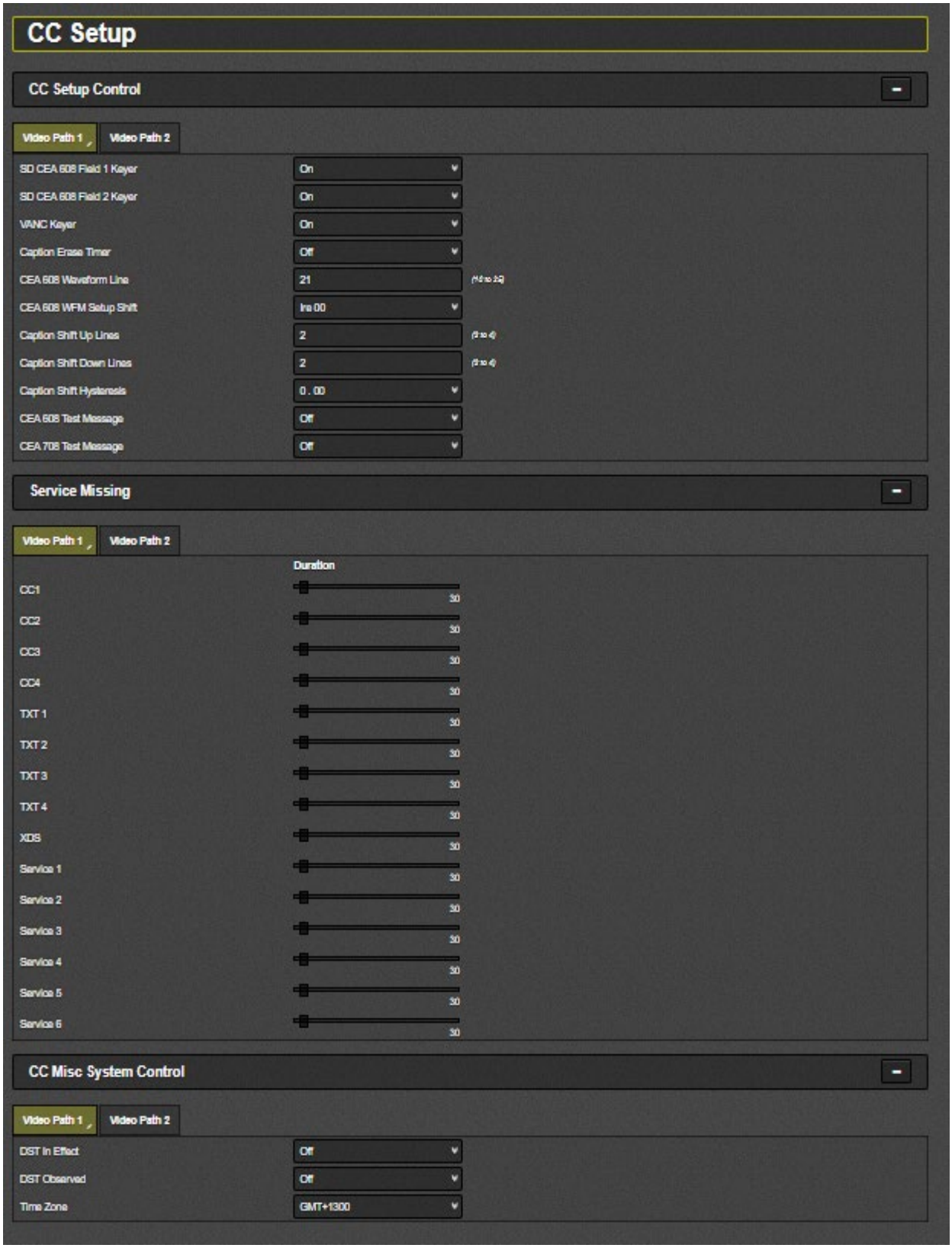


Figure 4-39 : WebEASY® - CC Setup

4.14.1. CC Setup Control

4.14.1.1. SD CEA-608 F1 and F2 Keyers

These controls allow the user to enable or disable the **Field 1 Keyer** & **Field 2 Keyer**

4.14.1.2. VANC Keyer

This control enables or disables the **VANC Keyer**. This is the global control for selecting whether any VANC data is inserted or altered in output video. VANC data includes CDP, AFD, and Broadcast Flag packets. Selecting **VANC Key Off** will disable the VANC keyer and not encode data into the VANC of the output.

4.14.1.3. Caption Erase Timer

The **Caption Erase Timer** control is used to erase the caption display. When enabled, the MIO–CCE–4K/3G will activate an internal timer and clock the time delay between processing caption data. If caption data is not detected for a period of 15 seconds, the MIO–CCE–4K/3G will encode a clear caption command. This command will be used by downstream decoders to clear the caption display.

4.14.1.4. SD CEA-608 Waveform Line

The **SD CEA-608 Waveform Line** parameter enables the user to the set the waveform line from 10 to 25.

4.14.1.5. SD CEA-608 Waveform Setup Shift

Setup Shift is used to select whether the caption data encoded on the downstream SDI video will be shifted to adjust for setup on line 21. It is common for 4:2:2 component to NTSC video encoders to add setup to line 21 regardless of whether there is a closed caption waveform on line 21 or not. The closed caption waveform will be moved up by 7.5 IRE when setup is added by the video encoder. The CEA-608 waveform specification states there should be no setup on line 21.

This control allows the operator to compensate for the setup when the encoding to NTSC video takes place by shifting the caption data down by 7.5 IRE. Note that, in order to shift the caption data down by 7.5 IRE, it is necessary to use digital video values that are not legal according to the SMPTE 125M Component Digital Video specification.

0 IRE will encode the caption waveform with a baseline at 0 IRE on 4:2:2 video signals. The resulting closed caption signal will contain legal SMPTE 125 data values, but may have 7.5 IRE of setup added when it is encoded to a composite video signal (depending on the video encoder). *-7.5 IRE* will encode the caption waveform shifted down by -7.5 IRE on 4:2:2 video signals. The resulting line of video will contain illegal SMPTE 125 data values but may have the 7.5 IRE of setup cancelled out when it is encoded to a composite video signal (depending on the video encoder).

4.14.2. Caption Shift Control

4.14.2.1. Caption Shift Up GPI

This feature allows the user to shift the baseline of the CEA-608 captions up by 2 to 4 lines. This feature is used when weather crawl information is keyed onto the SD-SDI video. GPI's A through F can be selected to enable or disable this function. The **Caption Shift Down GPI** control is identical. For the sake of brevity, only the **Caption Shift Up GPI** control will be discussed in the manual.

4.14.2.2. Caption Shift Up Lines

This control enables the user to set the baseline of the CEA-608 captions up from 2 to 4. The **Caption Shift Down Lines** control is identical. For the sake of brevity, only **Caption Shift Up Lines** will be discussed in the manual.

4.14.3. Test Message Enable

4.14.3.1. CEA-608 Test Msg

The **CEA-608 Test Message** is used to test all fields and outputs of the MIO-CCE-4K/3G. This function will provide test messages in Field 1 and Field 2 for the SD-SDI output and transcoded test messages on the HD/3G output. If the Translator is configured appropriately, the CEA-608 data will also be translated to CEA-708 data. This function is helpful during troubleshooting procedures.

4.14.3.2. CEA-708 Test Msg

The **CEA-708 Test Message** provides captions on Services 1 through 4. Each service shows a different caption test pattern. This feature helps users test downstream equipment such as HDTV decoders and ATSC encoders.

4.14.4. Service Missing

The Service Missing Duration provides the user with controls to set the timeout period before a caption service alarm is raised. There are 15 sliders in this panel which allow the user to set controls for services 608 CC1 to CC4, 608 TXT1 to TXT4, 608 XDS and 708 Svc 1 to Svc 6. The timeout period is displayed in minutes with a range from 0 minutes to 8.5 minutes. These may be configured to assert the GPOs or to generate a Fault Trap if the duration period is exceeded.

4.14.5. CC Misc System Control

4.14.5.1. DST In Effect

This control is used to indicate whether Daylight Saving Time (DST) is currently in effect. The DST setting will be used to calculate the current local time, and to set the DST flag in XDS packets.

When set to *off*, Daylight Saving Time compensation will not be applied. When set to *on*, Daylight Saving Time compensation will be applied to the time.

4.14.5.2. DST Observed

The **DST Observed** control allows the user to specify whether Daylight Saving Time is observed in their locale. This is used to calculate the current local time, and to set the DSO flag in XDS packets. For regions that observe Daylight saving time, the DST Observed setting must be set to *On*, and for regions that do not observe Daylight saving time, the DST Observed setting must be set to *Off*.

4.14.5.3. Timezone

This option allows the user to set a time zone offset between the UTC time and the Local time. This time zone offset will be added to the UTC time along with the Daylight Saving time correction to obtain the Local time. Time zones are normally in one hour or 30 minute increments and can be + or – from UTC. (Time zones east of Greenwich are +, and time zones west of Greenwich are -).

4.15. UPSTREAM CAPTIONS

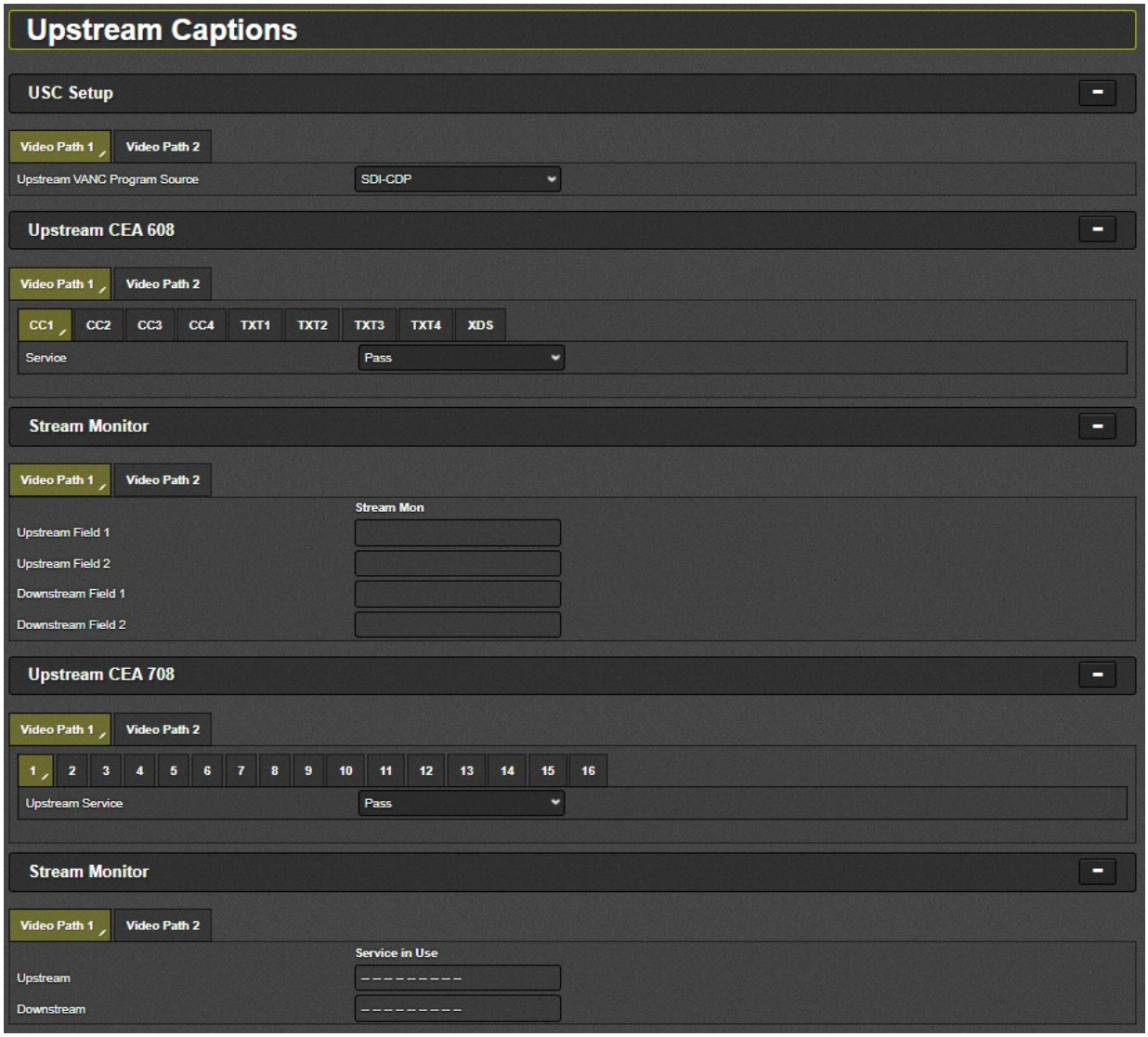


Figure 4-40 : WebEASY® - Upstream Captions

4.15.1. USC Setup

Upstream VANC Program Source: Selects the type of embedded caption data from upstream source.

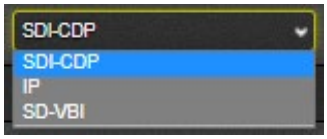


Figure 4-41: USC Setup

- **SDI-CDP :** Select for SDI – Caption Distribution Packets as upstream VANC source.
- **IP:** Select for IP as VANC source.
- **SD-VBI:** Select for SD – Vertical Blanking Interval as VANC source.

4.15.2. Upstream CEA 608

(For CC1-CC4, TXT1-TXT4 & XDS)
Service: Allows the user to configure which upstream CEA 608 services to pass.

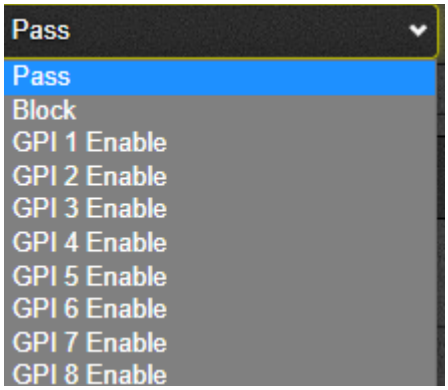


Figure 4-42: Service

4.15.3. Stream Monitor

This section contains stream monitor readback fields for upstream fields 1&2, and downstream fields 1&2.

4.15.4. Upstream CEA 708

(For streams 1-16)

Upstream Service: Allows the user to configure which upstream CEA 708 services to pass.

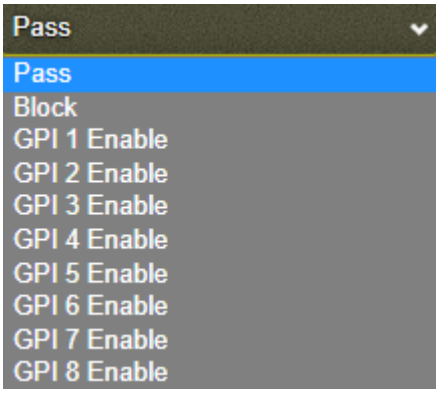


Figure 4-43: Upstream Service

4.15.5. Stream Monitor

This section contains a stream monitor readback field for upstream & downstream.

4.16. CDP

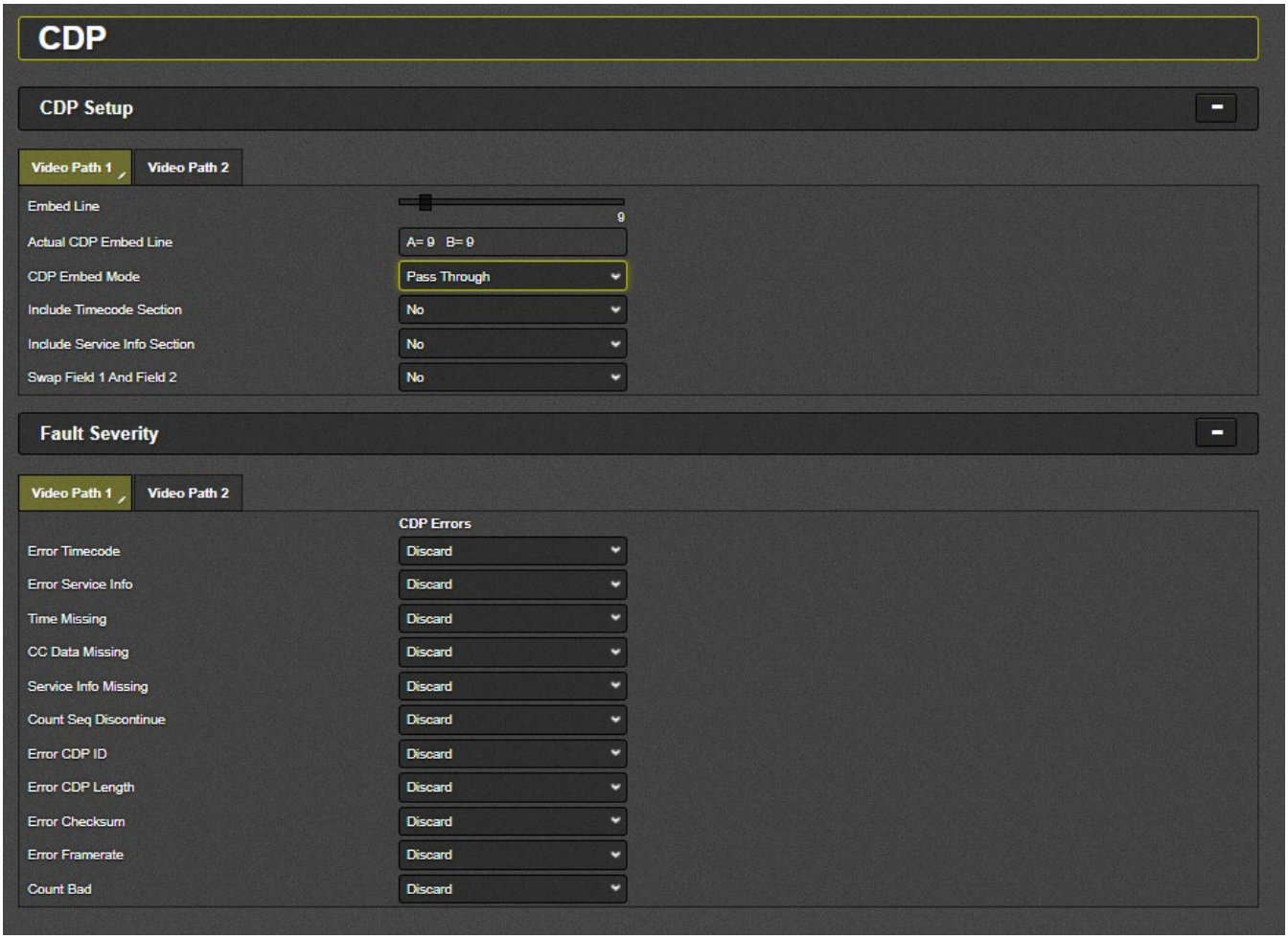


Figure 4-44 : WebEASY® - CDP

4.16.1. CDP Setup

Embed Line: Selects the VANC line for embedding caption distribution packets.

CDP Embed Mode: Select the CDP Embed Mode to Insert.

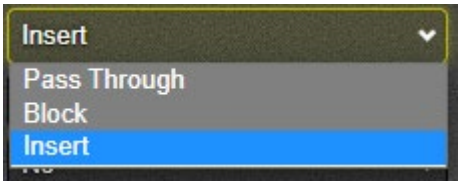


Figure 4-45: CDP Embed Mode

Actual CDP: Used to monitor CDP embed line.

Include Timecode Section: Includes (Yes/No) timecode section of CDP data.

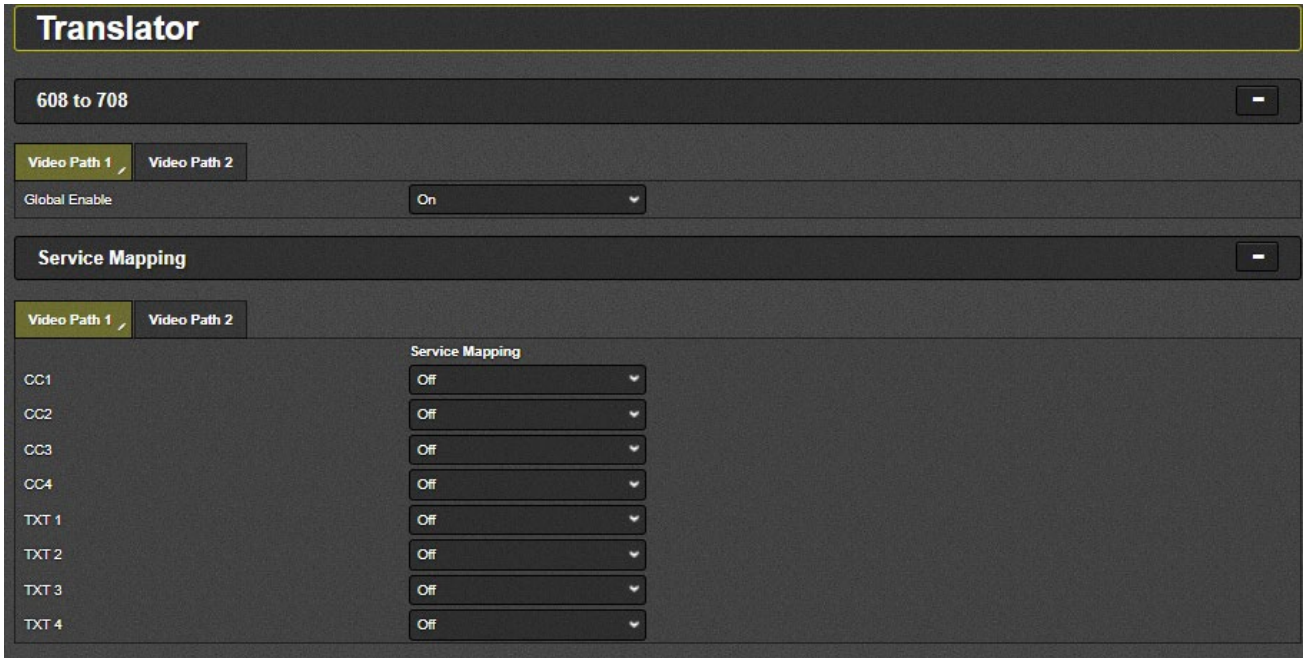
Include Service Info Section: Includes (Yes/No) service info section of CDP data.

Swap Field 1 and Field 2: Swaps (Yes/No) field 1 and field 2 data.

4.16.2. Fault Severity

This section allows the user to enable (**warn**) or disable **(discard)** fault for several CDP errors, including: Error timecode, error service info, time missing, CC data missing, count seq discontinue, error CDP ID, error CDP length, error checksum, error framerate, count bad.

4.17. TRANSLATOR



WebEASY® - Translator

4.17.1. 608 to 708

Global Enable: Used to control global 608 to 708 translator enable, or to enable only for specific GPI.

4.17.2. Service Mapping

(For CC1-CC4 and TXT1-TXT4)

This parameter is used to control translator 608 to 708 service mapping.

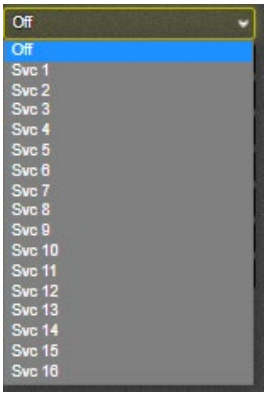


Figure 4-46: Service Mapping

4.18. OSD AND MONITORING

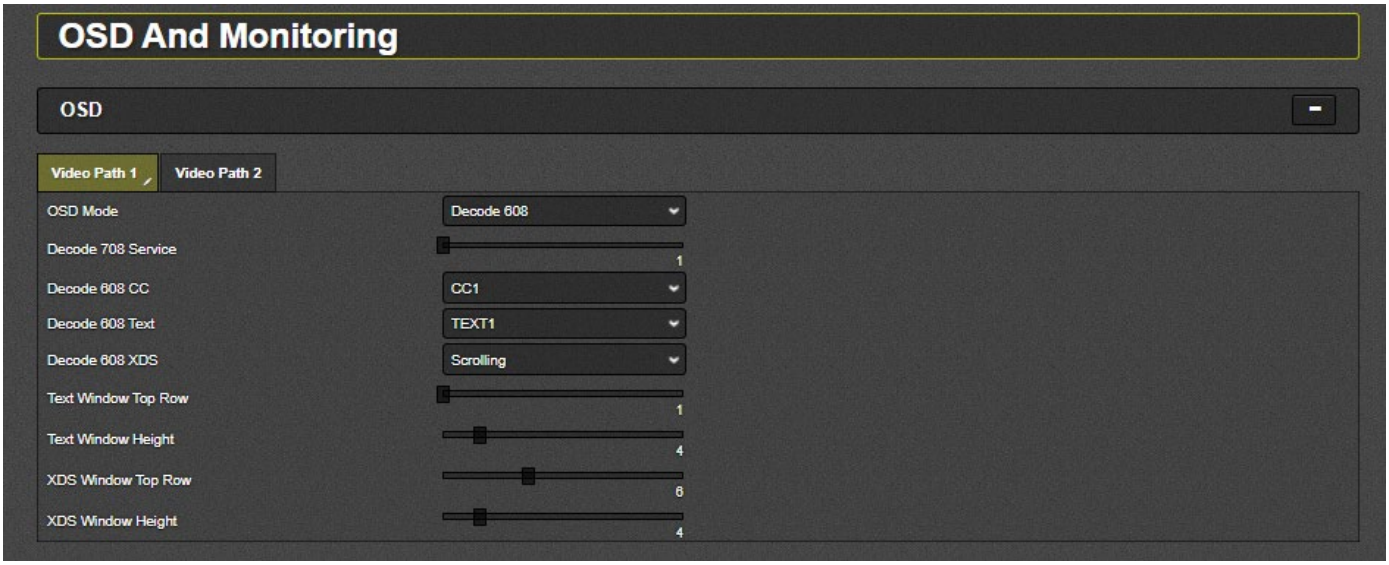


Figure 4-47: OSD And Monitoring

4.18.1. OSD

OSD Mode: Set the OSD mode to CEA-608, CEA-708 or off.

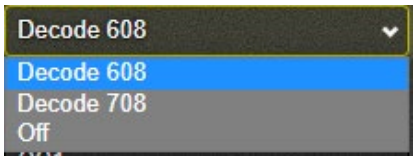


Figure 4-48: OSD Mode

Decode 708 Service: Use this slider control to select the CEA-708 service to be decoded for the selected video path. Default 1, Services 1-16 available.

Decode 608 CC: Select the CEA-608 CC to be decoded for the selected video path. Default is CC1

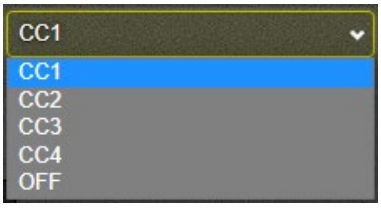


Figure 4-49: Decode 608 CC

Decode 608 Text: Select the text type for CEA-608. Default is TEXT1

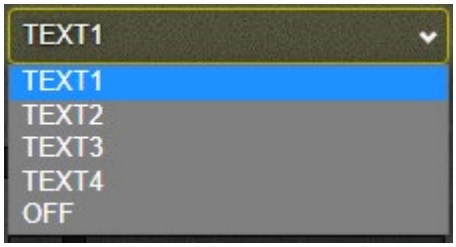


Figure 4-50: Decode 608 Text

Decode 608 XDS: The information display of the XDS window can be configured three different ways. The fixed position window is at a constant height and will display the XDS information within the selected area. Scrolling Display will display the XDS information as it is received by the card. Selecting Off will disable the XDS feature.

Figure 4-51 : Decode 608 XDS

4.19. AUDIO STREAMING (+AUDIO OPTION ONLY)

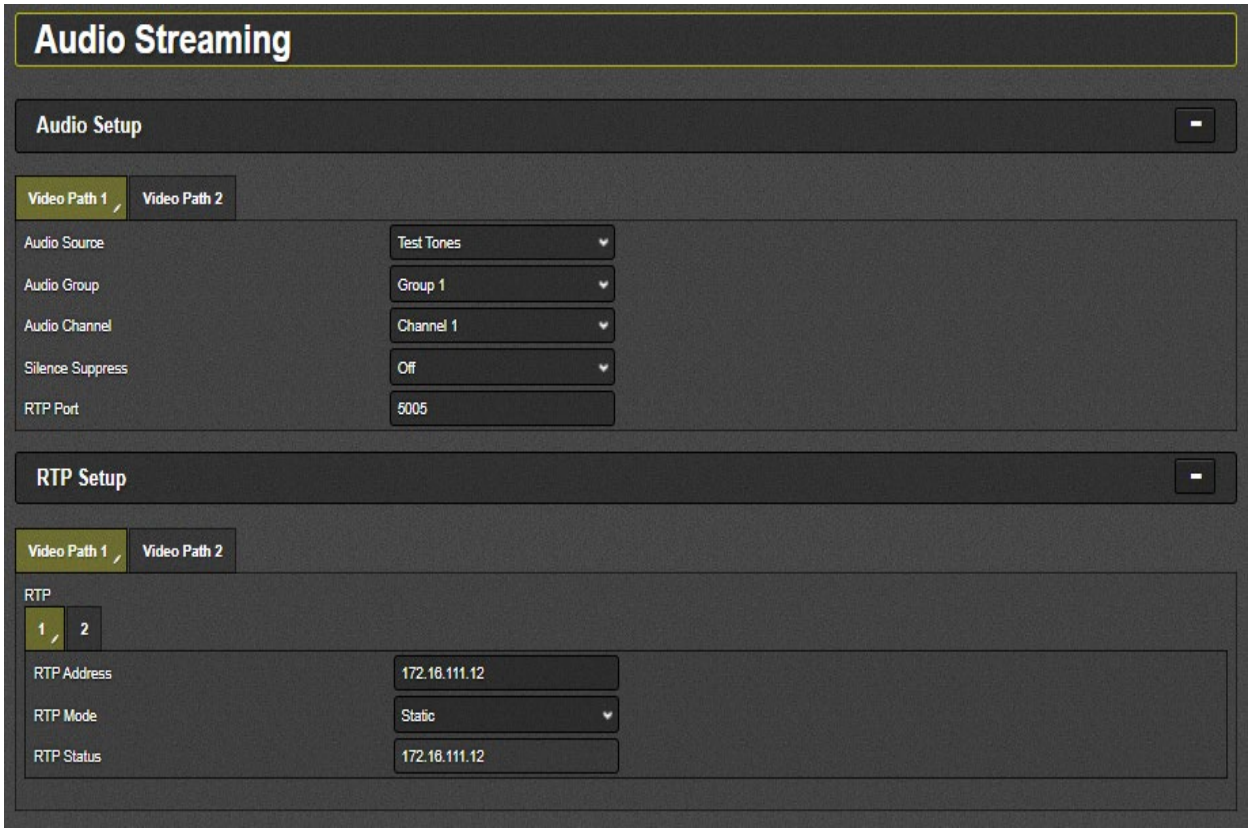


Figure 4-52 : Audio Streaming

4.19.1. Audio Setup

Audio Source: Select audio source for selected video path.

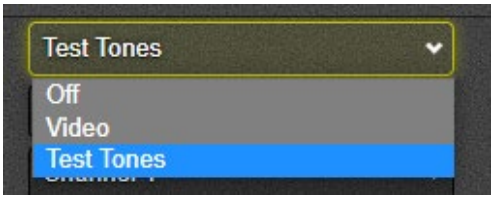


Figure 4-53: Audio Source

Audio Group: Select audio group for selected video path.

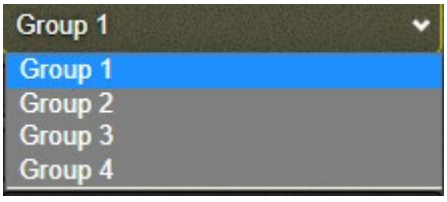


Figure 4-54: Audio Groups

Audio Channel: Select audio channel 1-4 or mix 12 or mix 34 for audio channel on selected video path.

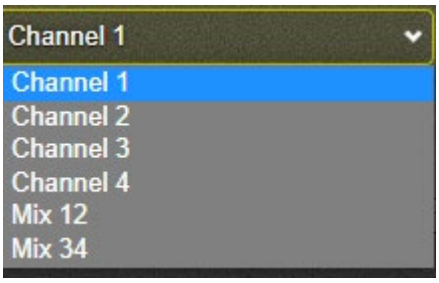


Figure 4-55: Audio Channels

Silence Suppress: Select for silence suppress level

Figure 4-56: Silence Suppresser

RTP Port: Select for static or dynamic RTP mode, or to turn RTP off.

4.19.2. RTP Setup

RTP Address: Set the RTP Address for selected video path & RTP

RTP Mode: Select RTP mode for selected video path & RTP.

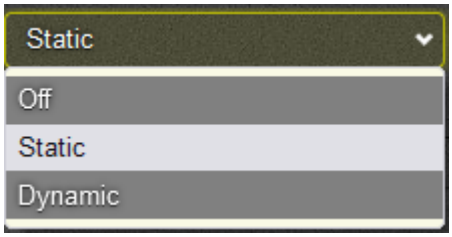


Figure 4-57: RTP Mode

RTP Status: Displays current RTP IP if active or 'NOT ACTIVE' if status is not active.

4.20. EXPORT CC FILES

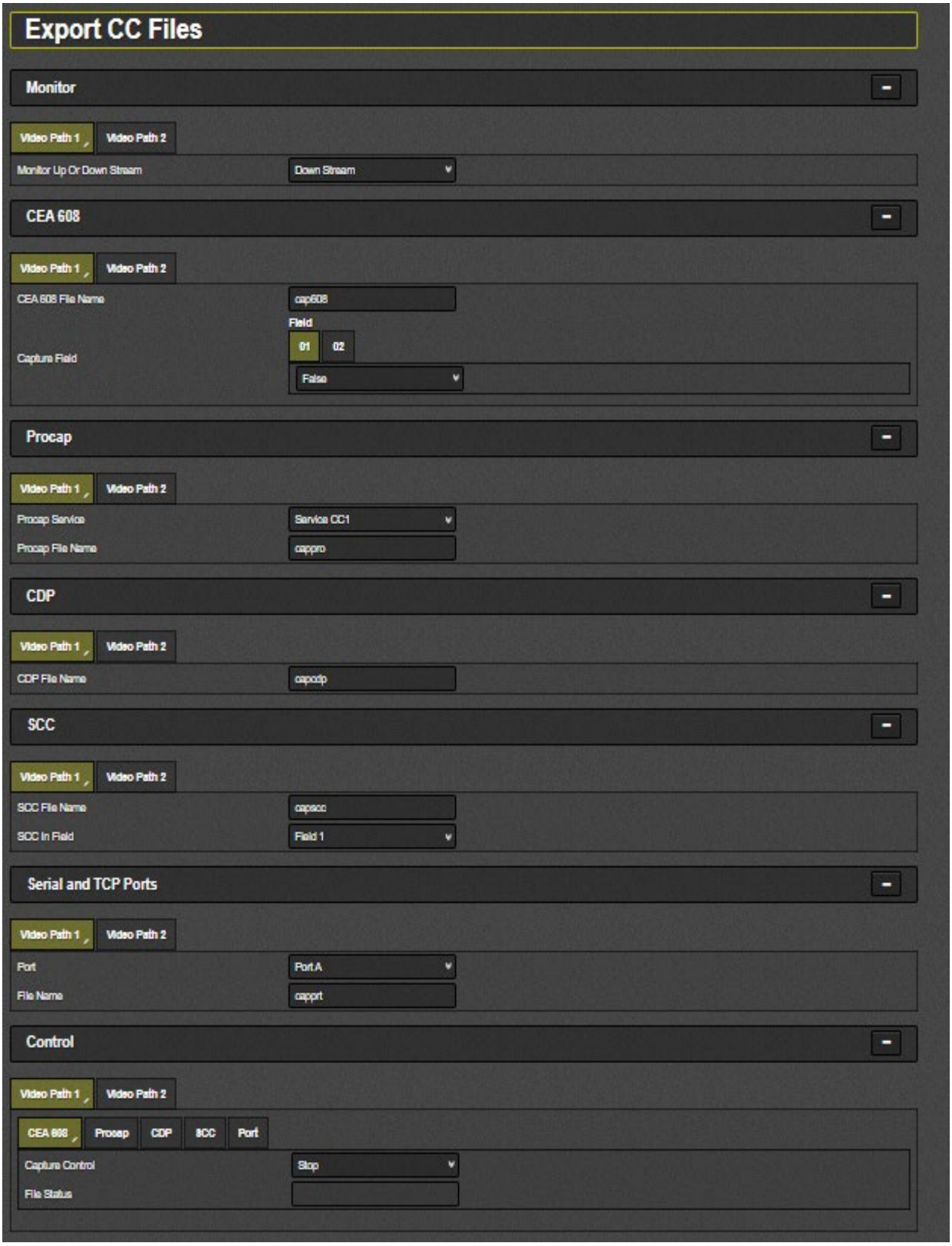


Figure 4-58 : WebEASY® - Export CC Files

4.20.1. Monitor

Monitor Up or Down Stream: Determine if capture CC data observed at input BNC (upstream of processing) or output BNC (downstream of processing)

4.20.2. CEA 608

CEA 608 File Name: Enter filename for CEA capture file

Capture Field: Control to select if field 1 or 2 should be captured.

4.20.3. Procap

Procap Service: Control to select which caption service to save to procap file.

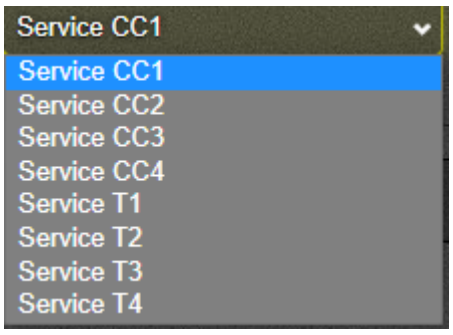


Figure 4-59:Procap Service Options

Procap Filename: Enter the filename for procap file

4.20.4. CDP

CDP File Name: Enter the filename for CDP file.

4.20.5. SCC

SCC File Name: Enter the filename for SCC file.

SCC in Field: Select wether field 1 or field 2 data is captured in SCC file.

4.20.6. Serial and TCP Ports

Port: Select which comm port traffic to be saved to the procap file.

Figure 4-60: Port

File Name: Enter the filename port capture file.

4.20.7. Control

For CEA 608, Procap, CDP, SCC, Port

Capture Control: Control to start/stop saving each type of capture file.

File Status: Field displays file status of selected CC file type.

4.21. IMPORT CC FILES

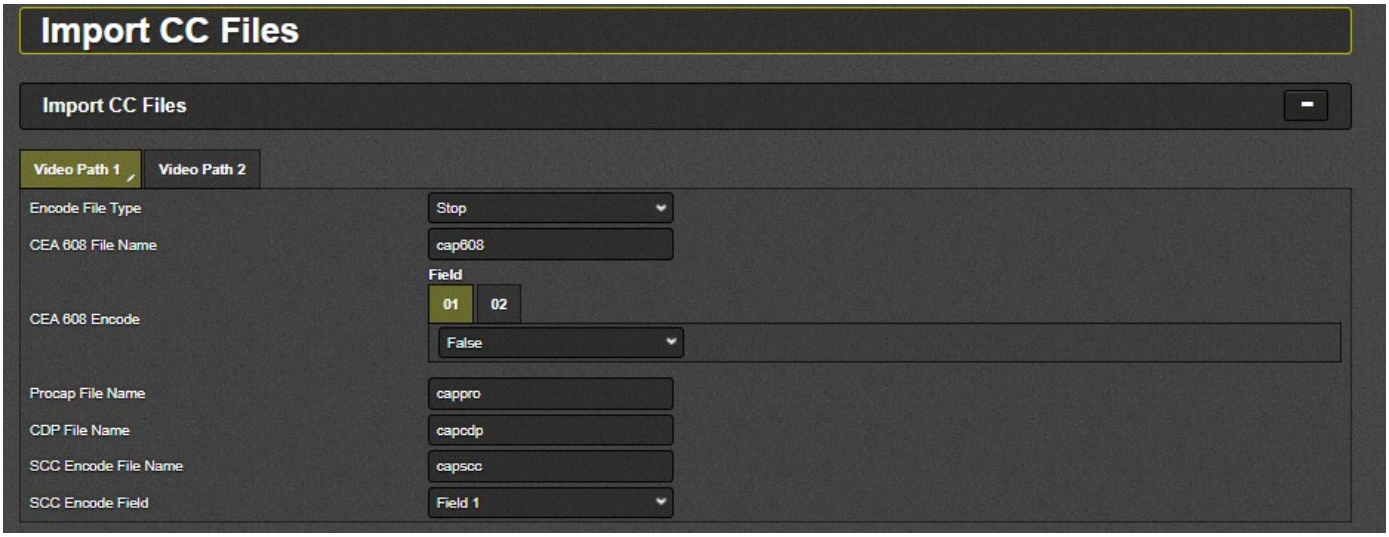


Figure 4-61 : WebEASY® - Import CC Files

4.21.1. Import CC Files

Encode File Type: Select the CC file encode type to be imported.

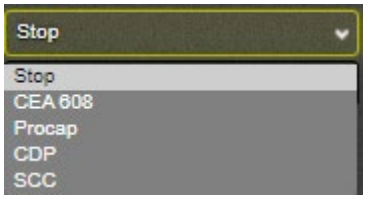


Figure 4-62: CC Files

CEA 608 File Name: Enter the filename to be imported

CEA 608 Encode (For Field 1 & 2): Select field and enable/disable CEA 608.

Procap File Name: Enter the procap file name

CDP File Name: Enter the CDP file name

SCC Encode File Name: Enter SCC encode file name

SCC Encode Field: Select field 1 or 2 for SCC encode

4.22. FACILITY SERVER (NOT AVAILABLE AT TIME OF WRITING)

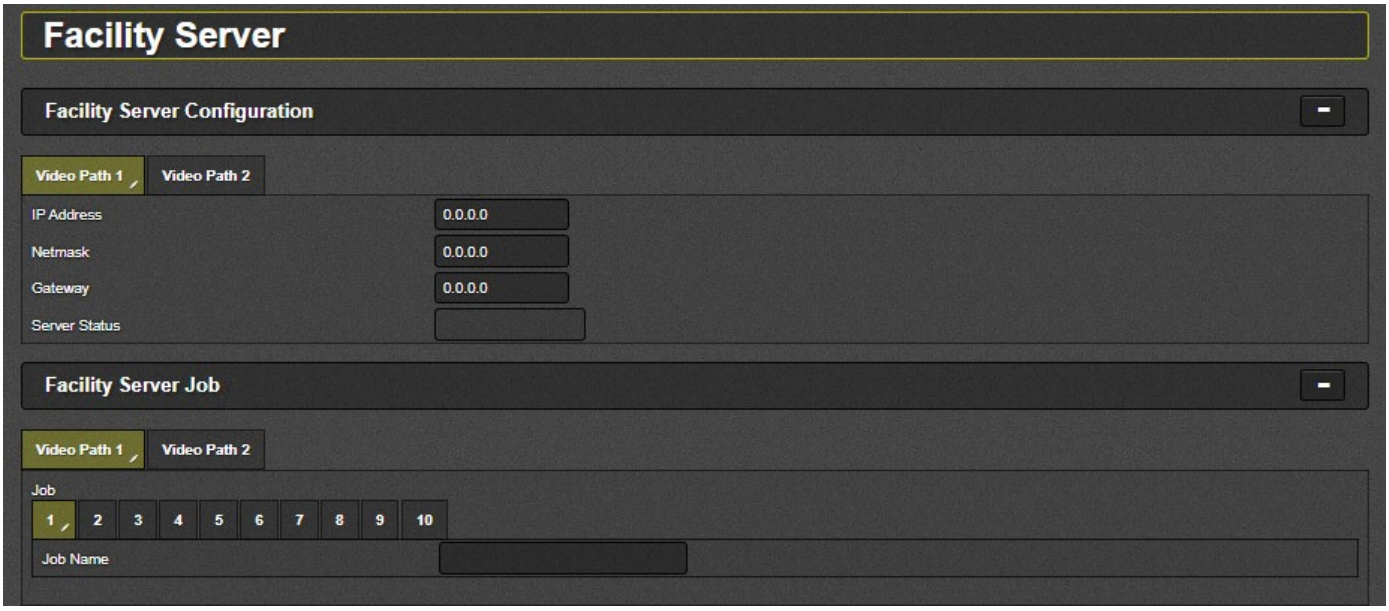


Figure 4-63 : WebEASY® - Facility Server

4.22.1. Facility Server Configuration

IP Address: Enter the IP address for facility server

Netmask: Enter netmask for facility server

Gateway: Enter gateway for facility server

Server Status: This field displays the current status of the facility server

4.22.2. Facility Server Job

Job 1-10

Job Name: Use this field to enter the job name for CC jobs 1-10.

4.22.3. System Notify

This section contains a dropdown control to enable (true) or disable (false) system alarms for temperature and port links on SFP 1 & 2. The system faults section will display green if this condition is healthy, or red if there is a fault detected.

Figure 4-64: System Notify

4.23. INPUT NOTIFY

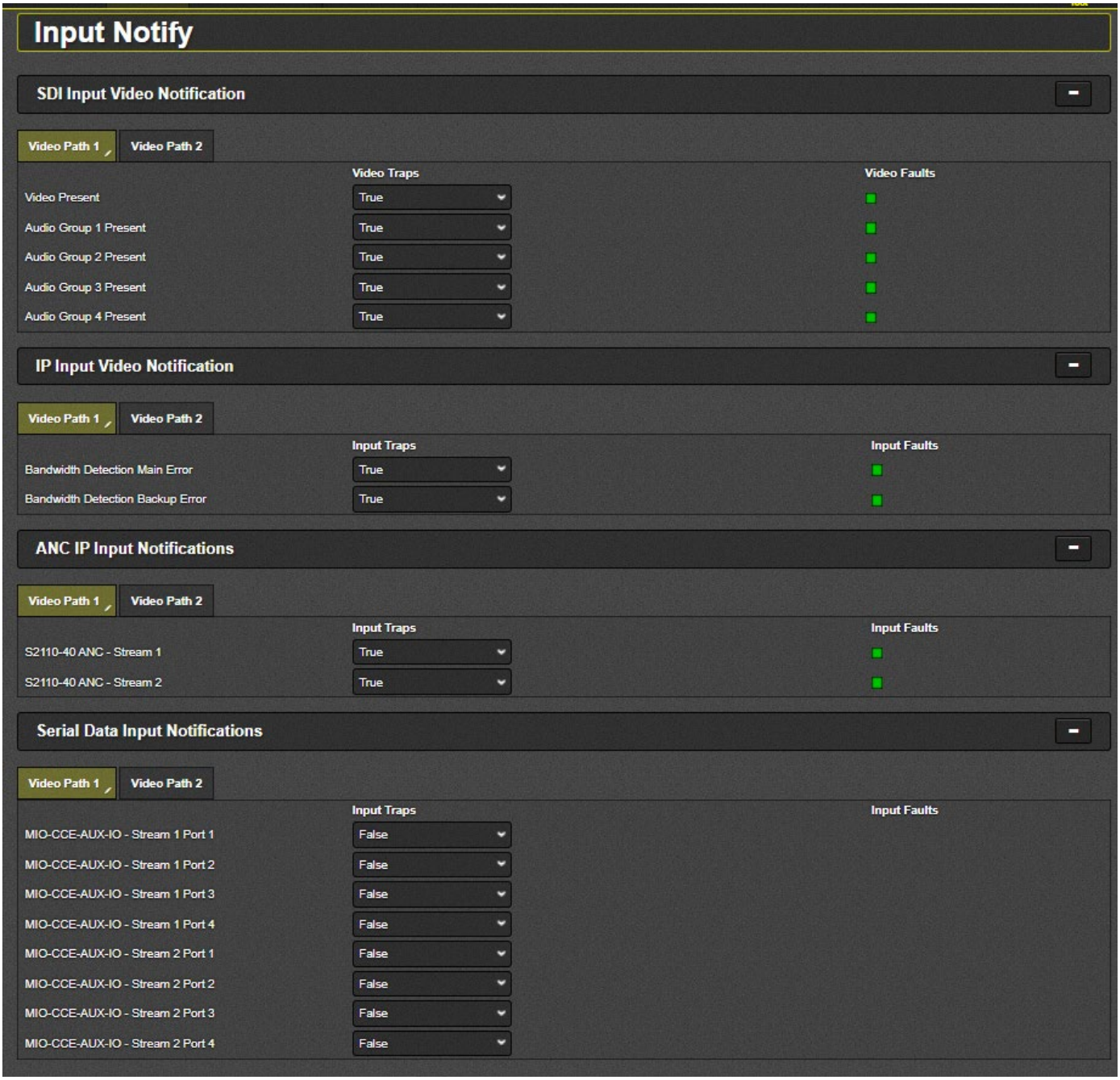


Figure 4-65 : WebEASY® - Input Notify

4.23.1. SDI Input Video Notification

This section contains a dropdown control to enable (true) or disable (false) traps for presence of video signal and audio group 1-4. The video faults section will display green if this condition is healthy, or red if there is a fault detected.

4.23.2. IP Input Video Notification

This section contains a dropdown control to enable (true) or disable (false) traps for bandwidth of IP video input for main and backup. The input faults section will display green if this condition is healthy, or red if there is a fault detected.

4.23.3. ANC IP Input Notifications

This section contains a dropdown control to enable (true) or disable (false) traps for bandwidth of IP ANC data and S2110-40 serial data. The input faults section will display green if this condition is healthy, or red if there is a fault detected.

4.24. CC NOTIFY

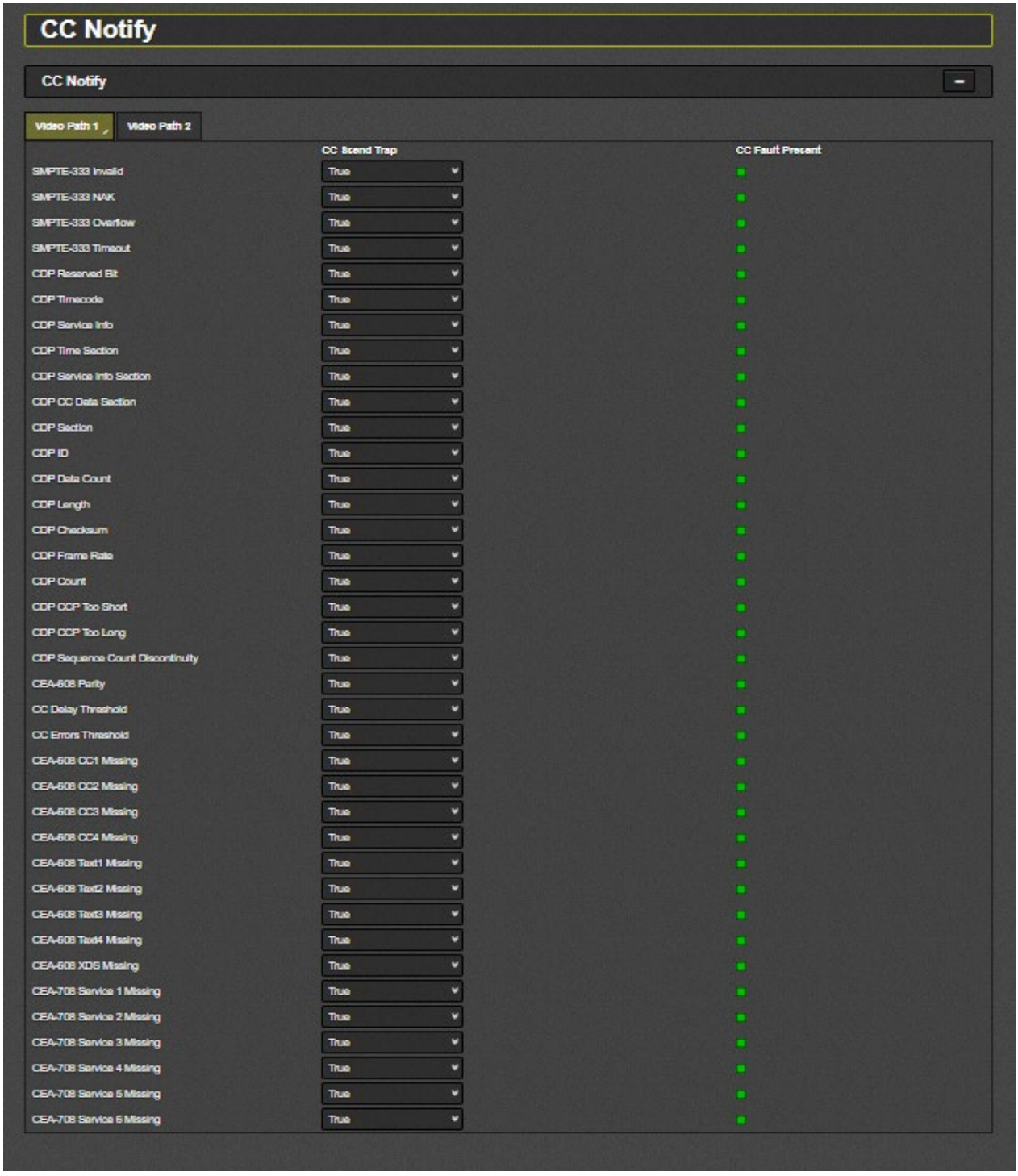


Figure 4-66 : WebEASY® - CC Notify

4.24.1. CC Notify

This section allows the users to enable or disable notifications for SMPTE errors, CDP errors, CEA-608 errors and CEA-708 errors.

4.25. LICENSE MANAGEMENT

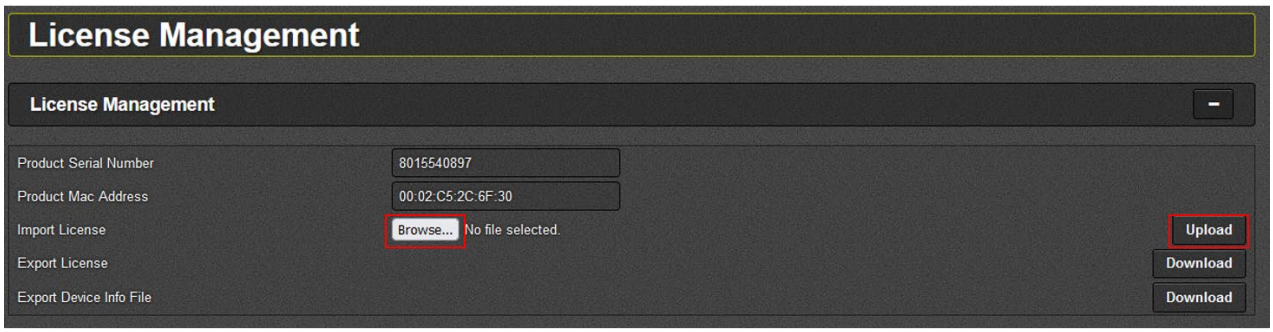


Figure 4-67 : WebEASY® - License Management

This section contains information about the product serial number, product MAC address. Information about additional product features will be displayed here.

To add license features,

1. Contact Evertz to obtain a new license file.
2. Load the license file to disk and on the license management page above select ‘Browse’ beside ‘Import License’ (Figure 4-5).
3. Select ‘Upload’ to load the selected license file to the MIO-CCE.
4. Wait for upload to complete

4.25.1. Product Features

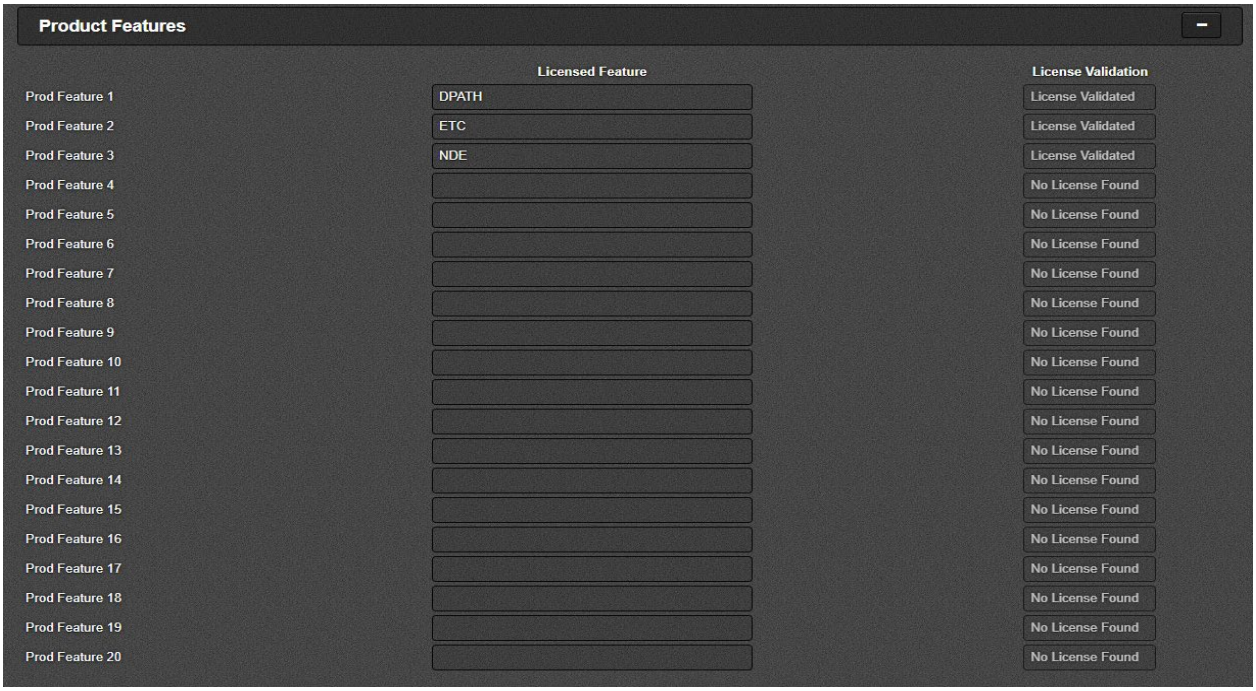


Figure 4-68: WebEASY® - Product Features

This section contains information about the license features that are currently active on the card.

5. SERIAL COMMAND PROTOCOL

The following sections present the command protocol for the MIO–CCE–4K/3G closed caption encoder. Section 5.1 provides a quick cross-reference to the command set. Sections 5.2 to 5.6 provide a full description of the commands with examples.

5.1. COMMAND QUICK REFERENCE

Serial Command Cross-Reference			
	Command	**Function**	**Section**
Control & Status	^A?	Report Firmware Version	5.3.6
	^Ac	Set/Report Time of Day	5.3.10
	^Ad	Set/Report Date	5.3.11
	^AE	Set Output Line	5.3.3
	^AI	Set Baud Rate	5.3.1
	^AH	Command Help Message	5.3.7
	^AM	Controlling the Caption Decoder	5.3.5
	^AA	Display System Status	5.3.16
	^AS	Report Bypass Status	5.3.8
	^AY	Report Battery Status	5.3.9
	^A5	Monitor Encoded Data	5.3.4
	^F^F	Reset Encoder	5.3.2
Captioning State	^A2	Real Time State	5.3.15
	^A3	Direct Control State	5.3.14
	^A6	Null State	5.3.13
	^A7	Transparent State	5.3.12
Text Articles	^A0	Input Article	5.4.1
	^A1	Output Article	5.4.2
	^A4	Delete article	5.4.3
	^A8	Queue Articles	5.4.4
	^A9	Display Article Status	5.4.5
	^AB	Display Output Queue	5.4.6
XDS Encoding	^AP	Input XDS Packet	5.5.1
	^AP	Block Upstream XDS Packet	5.5.2
	^A8	Queue XDS Packets	5.5.3
	^AP	Delete XDS Packets	5.5.4
Comm. Port Control	^AQ	Show Port Permission Maps	5.6.1
	^AQ	Alter Port Permission Maps	5.6.2
	^AO	Show Ports Active Maps	5.6.3
	^AO	Alter Ports Active Maps	5.6.4
	^Ar	Reset Port	5.6.5

Figure 5-1: Command Quick Reference

5.2. COMMAND SYNTAX DESCRIPTION

The Command line shows the required information in **bold underlined text**. Optional parameters are shown in **bold normal text**. The default line shows the parameter values that will be invoked if the optional parameter(s) are omitted. Many of the commands use control characters which are indicated by a carat character '^' preceding a letter. (E.g. Control-A is shown as ^A). Other special characters are shown enclosed in <brackets>. (See section 5.2.1 for a description of the control characters and special characters and their ASCII values). (All ASCII values are shown in hexadecimal notation). Parameters are shown in lower case. (See section 5.2.2 for a description of the parameters and their values). All upper case alphanumeric characters that are not preceded by the carat or enclosed in brackets are to be interpreted as individual characters. (E.g. F1 is an 'F' followed by a '1').

5.2.1. Special Characters

Most commands use control characters to communicate with the encoder. The chart below shows the designators for the control characters and other special characters that are used in the command descriptions:

Designator	Name	ASCII Values (Hex)
^A	Control-A	01
^B	Control-B	02
^C	Control-C	03
^F	Control-F	06
^G	Control-G	07
^H	Control-H (backspace)	08
^X	Control-X (delete line)	18
<sp>	Space	20
<cr>	Carriage Return	0D
<xon>	Start transmission	11
<xoff>	Halt Transmission	13

5.2.2. Parameters

Some commands use parameters with variable values. The command descriptions use a generic designator to indicate these parameters. The chart below shows each of the designators with their meanings and the permitted values. The values shown are the actual characters to be inserted into the command message. Normally parameters should be separated from each other by a <sp>.

Designator	Name	Values	Description
fx	Field Number	F1	Field 1
		F2	Field 2
dc	Data Channel	C1	Caption Channel 1
		C2	Caption Channel 2
		C3	Caption Channel 3
		C4	Caption Channel 4
		T1	Text Channel 1
		T2	Text Channel 2
		T3	Text Channel 3
		T4	Text Channel 4
		XD	Extended Data Services Channel
		For compatibility with older software the following designators are also used to describe caption data channels:	
		CC1	Caption Channel 1
		CC2	Caption Channel 2
		CC3	Caption Channel 3
		CC4	Caption Channel 4
tc	Text Channel	T1	Text Channel 1
		T2	Text Channel 2
		T3	Text Channel 3
		T4	Text Channel 4
		For compatibility with older software the following designators also refer to the text channels:	
		L1	Text Channel 1
		L2	Text Channel 2
		L3	Text Channel 3
		L4	Text Channel 4

Designator	Name	Values	Description
name	Article Name		1 to 8 alphanumeric character article name
edsid			XDS packet Id input as 2 ASCII hex digit class followed by 2 ASCII hex digit type. (cctt). Valid class numbers are: 01, 03, 05, 07, 09, 0B, OD. Leading zeros of the class numbers are optional. In cases where the class and type bytes are not sufficient to uniquely distinguish the packets, (such as for 0D05 packets) the first 2 digits of the packet data may also be appended to the end of the edsid. (ccttdd)
k/d	Keep/Delete	K	Keep article
		D	Delete article
o/h	Output/Hold	O	Place article in output queue
		H	Do not place article in output queue
n/l	Next/Last	N	Place article next in output queue
		L	Place article at the end of output queue
rc	Repeat Count	0 to 9998	Decimal number of times to repeat article
		9999	Repeat indefinitely
		FFFF	Repeat indefinitely
		hh:mm:ss	Repeat until this time is being requested by the computer (Current software treats this as equivalent to 9999)
ln	Output Line	10 to 25	
bl	Caption Base Line	1 to 15	Base line of caption rollup display
rl	Caption Rollup Lines	2 to 4	Number of lines of rollup captions
pn	Port Name	P1, PA, EN1	Port A
		P2, PB, EN2	Port B
		P3, PC, EN3	Port C
		P4, MA, MD EN4	modem D
		P5, MB, ME, EN5	modem E (if installed)
dt	Data Type	CF1	Captions field 1
		CF2	Captions field 2
		TF1	Text field 1
		TF2	Text field 2
		XDS	Extended data services

Designator	Name	Values	Description
ws	Word size	7	7 bit data word
		8	8 bit data word
par	Parity	O	Odd parity
		E	Even parity
		N	No parity
tz	Time zone	0:00 to 23:59	Time zone hours and minutes relative to UTC
ovr	Override	O	Forces override

5.2.3. Flow Control Handshaking

When the encoder's input buffer is nearly full the device sends an XOFF for each character received. If the Caption software continues to send data and the input buffer fills completely, and creates a buffer overflow state. When the input buffer has overflowed some data may be lost. When the input buffer is nearly empty the caption encoder will transmit an XON character. The MIO–CCE–4K/3G uses hardware flow control to prevent lost data. The unit will turn off the RS232 RTS signal when the buffer is nearly full, and will turn RTS on when the input buffer is nearly empty.

5.2.4. Break Handling

A break character can be sent to the caption encoder to cause the content of the associated input buffer to be discarded. If the break character is sent to the modem port the modem character buffers will also be discarded. This allows the user to circumvent a backlog of data input, and regain immediate control of the encoder. The best way to reset a communications port is to send a break followed by a Control-F – Control-F command.

5.2.5. Command Responses

When the MIO-CCE accepts any of the Control-A commands it will respond by sending back an asterisk '*' prompt with the following exceptions:
When in real time mode it will respond with a colon ':' prompt.
When an article is being defined it will respond with a '>'.

5.3. COMMON COMMANDS

5.3.1. Set Baud Rate

The caption encoder's serial remote control ports may be set to operate at any standard baud rate from 1200 to 57600. When this command is executed the new baud rate will become immediately active, and the sending computer must immediately switch to the new rate. The new baud rate is stored in non-volatile memory and will be restored when the unit is powered up.

The modem ports may have a lower maximum baud rate that is related to the maximum baud rate of the built-in modems. The baud rate for the modem ports will also limit the maximum connection rate that the modems will allow.

Command: ^AI<sp>pn<sp>baud<sp>ws<sp>par<cr>
or ^AI<cr>

Default: none

The parameter baud specifies the baud rate that will be used. The permitted values of parameter baud are shown in the table below.

Parameter	Baud Rate
12	1200
1200	1200
24	2400
2400	2400
48	4800
4800	4800
96	9600
9600	9600
192	19200
19200	19200
384	38400
576	57600

If the optional port name parameter is missing, then the current control port will be assumed. If no parameters are specified, the MIO–CCE–4K/3G will respond with a report of the communication parameters of all the COMM ports as shown below.

Port A: 1200 7 Odd
Port B: 9600 8 None
Port C: 1200 7 Odd
Port D: 4800 8 None

Examples: ^AI<sp>19200<cr> Set baud rate to 19200
^AI<sp>P1<sp>96<sp>8<sp>N Sets Port A to 9600,8,N

5.3.2. Reset Encoder

This command immediately clears the input and output data queues and resets the MIO–CCE–4K/3G to the Transparent State in Field 1 and Field 2. Article and XDS output queues are not reset by this command. They must be explicitly reset by using the queue articles and queue XDS commands. (See sections 6.4.4 and 6.5.3.) To reset only a particular communications port, refer to the Reset Port (^Ar) command in section 6.6.5.

Command: ^F^F<cr>

Default: none

5.3.3. Set Output Line

The normal line for caption information is line 21 in SD-SDI. This command allows the MIO–CCE–4K/3G to output caption information on different line numbers. This command also changes the line number used by the decoder.

Command: ^AE<sp>Lln<cr>
Default: ^AE<sp>L21<cr> for SD-SDI systems
The parameter ln specifies the line number that caption information will be output on. The permitted values of parameter ln are 11 to 25.

Examples:	^AE<cr>	Reset to default
	^AE<sp>L20<cr>	Set for line 20
	^AE<sp>?<cr>	Show current line

5.3.4. Monitoring Line 21 Data on the Serial Port

This command allows the MIO–CCE–4K/3G to extract line 21 information from the input or output video and send it out the serial port. Enter a ^G to end monitor mode.

Command: ^A5<sp>fx<sp>o<cr>

The parameter 'fx' specifies the field that data will be extracted from.
The parameter 'o' specifies that the output data will be monitored.

Example:	^A5<sp>F1<cr>	Monitor Field 1 Input
	^A5<sp>F2<sp>O<cr>	Monitor Field 2 Output

5.3.5. Controlling the Caption Decoder

This command allows the unit to display line 21 information on the built-in caption decoder.

Command: ^AM<sp>dc<cr> Decode a specific channel
or ^AM<sp>OFF<cr> Turn off Decoder off

The parameter 'dc' specifies the data channel that will be decoded and displayed. In addition to the **dc** values shown in section 6.2.2, the following additional values are supported only for this command.

dc	Data Channel	VCHIP V-Chip Decoder
XDS	XDS Decoder	
XDSG	XDS Decoder	
XDSF	XDS Decoder	

Note that there is only one XDS decoder mode so all 3 commands will accomplish the same effect. Support for the XDSG and XDSF strings added for compatibility with the EEG command set.

Examples:	^AM<sp>C1<cr> Display Caption Channel 1	
	^AM<sp>VCHIP<cr>	Display V-CHIP rating
	^AM<sp>XDS<cr>	Switches decoder to XDS display mode.

5.3.6. Report Firmware Version

The caption encoder will respond with a message identifying its firmware version and port name.

Command: ^A?<cr>
Returns `Evertz MIOCCE-3G Ver:CK88D5 U000427 -- Use ^AH{return} for help`
`Port B (Example)`

5.3.7. Command Help

This command returns a help message from the caption encoder.

Command: ^AH<cr>
Default: none

Returns:
```
Cmds supported - ^C,^F,...
^A +0,1,2,3,4,5,6,7,8,9,A,B,c,E,H,I,M,O,P,Q,r,t,u,S,Y,?
```

5.3.8. Report Bypass Switch Mode

This command returns a message that shows the status of the video bypass relay and the caption keyer.

Command: ^AS<cr>

Example results:

`REMOTE OVERRIDE` indicates that the keyer is disabled but video will be passed through the MIO–CCE–4K/3G

`EXTERNAL BYPASS` indicates the SDI bypass relay has been activated by an external signal.

`LOCAL BYPASS ON` indicates the SDI bypass relay has been activated by the MIO–CCE–4K/3G menu selection.

5.3.9. Report Battery Status

This command will return the status of the internal battery

Command: ^AY<cr>

Example results: `Battery OK`

5.3.10. Set / Report Time of Day Clock

This command will return the current time of day or will allow the internal clock to be set. The unit will maintain the correct time even through power outages.

Command: ^Ac<cr>

Example results:
Local time is 13:47:39, Time zone is 05:00, DST is ON, DSO is ON

Command: ^Ac<sp>U<cr>

Example results:

```
UTC is 19:47:39, Time zone is 05:00, DST is ON DSO is ON
```

Command: ^Ac<sp>hh:mm:ss<sp>hh:mm<sp>dst<sp>DSO=dso<cr>

hh:mm:ss	Local time	
hh:mm	Time zone offset	
dst	OFF	Daylight Saving Time not in effect (DST Bit Off)
	ON	Daylight Saving Time in effect (DST Bit On)
dso	OFF	Daylight Saving Time not observed in this region (DSO Bit Off)
	ON	Daylight Saving Time observed in this region (DSO Bit On)

Although the time zone must be entered as hours and minutes, the XDS Time Zone packet will only transmit the time zone hours. This is a limitation of the definition of the time zone packet in CEA-608.

Example: ^Ac<sp>13:10:00<sp>5<sp>ON<sp>DSO=ON<cr>
Set local time to 1:10 pm in EDT (Daylight Saving Time in effect), Daylight Saving Time observed.

^Ac<sp>13:10:00<sp>5<sp>ON<sp>DSO=OFF<cr>
Set local time to 1:10 pm in EST (Daylight Saving Time in effect), Daylight Saving Time not observed. (i.e. As in Indiana)

^Ac<sp>06:10:00<cr>
Set local time to 6:10 am. Time zone, DST and DSO unchanged.

^Ac<sp>13:10:00<sp>4:30<sp>OFF<sp>DSO=ON<cr>
Set local time to 1:10 pm in Newfoundland Time Zone with Daylight Saving Time not in effect, but Daylight Saving time observed

The DST bit instructs the encoder whether Daylight Saving Time is currently in effect. The DSO bit instructs the encoder whether Daylight Saving Time is observed in this region. The encoder must know this information when converting between local time and UTC time internally. Most regions in North America observe Daylight Saving Time according to the following rule: ON in the summer; starting on the second Sunday in March. OFF in the winter; starting on the first Sunday in November. Other parts of the world follow different rules for DST.

5.3.11. Set / Report Calendar Date

This command will return the current calendar date or will allow the internal calendar date to be set. The encoder will maintain the correct date even through power outages.

Command: ^Ad<cr>

Example results:

Local date is: Jan/09/2000 Mon.

Command: ^Ad<sp>U<cr>

Example results:
UTC date is: Jan/10/2000 Mon.

Command: ^Ad<sp>mm/dd/yyyy<sp>day of week<sp>U<cr>
Example: ^Ad<sp>01/26/2000<sp>4<cr>
Set local date to January 26, 2000 and day is Wednesday.

^Ad<sp>03/25/2001<cr>
Set local date to March 25, 2001. No day of week indicated.

^Ad<sp>12/21/2001<sp>7<sp>U<cr>
Set UTC date to December 21, 2001.

5.3.12. Transparent State

In Transparent state, incoming line 21 video in the respective data stream will be copied to the output.

Command: ^A7<sp>fx<cr>
^A7<sp>dc<cr>

Default: ^A7<sp>F1<cr>

In the first form of the command, the optional parameter **fx** identifies the field (i.e. all streams in that field) that will be placed in the transparent state.

In the second form of the command the parameter **dc** identifies the data stream that will be placed in transparent state.

Examples:	^A7<sp>F1<cr>	Field 1 in transparent state
	^A7<sp>C1<cr>	Captions 1 in transparent state
	^A7<sp>T2<cr>	Text 2 in transparent state
	^A7<sp>TX<cr>	XDS stream in transparent state

5.3.13. Null State

In the Null state, the encoder will insert Null characters for the selected data stream into line 21. Incoming line 21 video will not be copied through on the data stream.

Command: ^A6<sp>fx<cr>
^A6<sp>dc<cr>

Default: ^A6<sp>F1<cr>

In the first form of the command, the optional parameter **fx** identifies the field (i.e. all streams in that field) that will be placed in the Null state.
In the second form of the command the parameter **dc** identifies the data stream that will be placed in the Null state.

Examples:	^A6<sp>F1<cr>	Field 1 in Null state
	^A6<sp>C1<cr>	Captions 1 in Null state
	^A6<sp>T2<cr>	Text 2 in Null state
	^A6<sp>TX<cr>	XDS stream in Null state

5.3.14. Direct Control State

This command causes the encoder to enter the Direct Control state. The Direct Control state is normally terminated by sending the End Of State command (^C), which will cause the encoder to revert to the Null state.

Command: ^A3<sp>n<sp>fx<cr>data . . . data^C
or
^A3<sp>n<sp>dc<cr>data . . . data^C

Default: ^A3<sp>4<sp>F1<cr>

In the first form of the command, the optional parameter **fx** identifies the field (i.e. all streams in that field) that will be placed in the Direct Control state. In the Direct Control state, caption information is inserted into the appropriate video field in one of the four modes that are described below. All upstream caption and text data in that field will be blocked. Any articles queued for insertion to that field will also be blocked. The computer supplies all the information for that field, formatting it with the appropriate stream control codes.

In the second form of the command, the optional parameter **dc** identifies the data channel that will be placed in the Direct Control state. All upstream caption and text data in the specified data channel will be blocked. Any articles queued for insertion to that data channel will also be blocked. The computer supplies all the information for that data channel, formatting it with the appropriate stream control codes. All caption information in the non-specified data channels will be passed through.

The optional parameter **n** identifies which variation of the Direct Control state will be used.

n=1 provides the same processing as n=2.

n=2 means that legitimate line 21 control codes are aligned and delayed so that the two byte control
code pairs are transmitted in the same field.

n=3 means that legitimate line 21 control codes are aligned and delayed so that the two byte control code pairs are transmitted in the same field. Each control code pair is sent twice.

n=4 provides the same processing as for n=3. No non-line 21 codes are transmitted and the control codes are converted (if necessary) to the correct equivalent code for the current video field.

Examples:	^A3<cr>	Field 1 in Direct Control mode 4
	^A3<sp><cr>	Field 1 in Direct Control mode 4
	^A3<sp>1<cr>	Field 1 in Direct Control mode 1
	^A3<sp>F2<cr>	Field 2 in Direct Control mode 4
	^A3<sp>3<sp>F1<cr>	Field 1 in Direct Control mode 3
	^A3<sp>C1<cr>	Caption channel 1 in Direct Control mode 4
	^A3<sp>3<sp>T1<cr>	Text channel 1 in Direct Control mode 3

5.3.15. Real Time State

In Real Time state, incoming data from the caption computer is transferred as it is typed into the appropriate data stream. The line may be edited using ^H (backspace) or ^X (delete line). A delay of 1 to 9 seconds can be inserted by including ^Bn into the data (n is the number of seconds of delay desired).

If a caption data channel is specified, captions will be in rollup format with a specified number of lines. The default format is 3 line caption rollup for caption data channels and text format for text channels.

When the data channel is put into the real time state, upstream data on the specified channel will be blocked from entering the output queue of the encoder. All subsequent data is part of the data stream until ^C is received or the encoder is reset. If the specified data stream is a text channel, articles will be suspended from the output queue while the real time state is active. All caption information in the non-specified data channels will be passed through.

Real Time state is normally terminated by a ^C. Articles will be re-enabled into the output queue starting with the suspended article. If upstream data was enabled prior to entering the Real Time State then it will be re-enabled when the Real Time state is terminated.

Command: ^A2<sp>dc<sp>rl<sp>Bbl<cr>

Default: ^A2<sp>C1<sp>3<sp>B15<cr>

The parameter **dc** identifies the data channel that will be placed in the Real Time state.

The **rl** parameter identifies the number of rollup rows and the **bl** parameter identifies the base line if the **dc** parameter is one of the caption data channels. If the base line is specified the roll up line must also be specified.

Examples:

^A2<cr>	**Caption 1 in Real Time State with 3 line rollup at base line 15**
^A2<sp>T2<cr>	**Text 2 in Real Time State**
^A2<sp>C3<sp>2<cr>	**Caption 3 in Real Time State with 2 line rollup at base line 15**
^A2<sp>C4<sp>3<sp>B10<cr>	**Caption 4 in Real Time State with 3 line rollup at base line 10**

5.3.16. Display System Status

This command displays the upstream line 21 data channels that are turned on (i.e.: upstream data being passed through to the output) and the number of bytes of memory remaining to store articles and XDS packets.

Command: ^AA<cr>

Default: none

Examples: ^AA<cr>

Returns:
Example with all channels On:

```
Memory Status: Avail-005453  # Segments-000011 Largest Avail-005453
Channel Status:
Field 1:C1 C2 T1 T2 ON
Field 2:C3 C4 T3 T4 XD ON
```

Example with all channels On except T3:

```
Memory Status: Avail-005453  # Segments-000011 Largest Avail-005453
Channel Status:
Field 1:C1 C2 T1 T2 ON
Field 2:C3 C4 T4 XD ON
```

5.4. TEXT ARTICLES

When the Article state is active, text data can be entered and stored as complete messages. These messages can be transmitted in any order, any number of times, in any of the text channels. Display attributes contained within the articles (such as color, etc.) specifically coded for one data stream will be translated into the appropriate codes for the text channel they are ultimately inserted into.

The message can be kept in memory or deleted when you have finished transmitting it. Articles will be lost from the article memory in the event of a power loss. The MIO–CCE–4K/3G uses an advanced memory allocation scheme that enables it to store a virtually unlimited number of articles at one time. The only requirement is the maximum amount of random access memory available.

The command protocol allows editing of each line of the message by use of the ^H (backspace) and ^X (delete line) characters before the <cr> is input. A delay of 1 to 9 seconds can be inserted into the article by inserting ^Bn into the article. (n is the number of seconds of delay desired)

Once a text channel is put into Article state, upstream data on that channel will be blocked from the output queue. A data channel will be in the article state as long as any article is assigned to its output queue.

5.4.1. Input Article

This command allows the user to input an article to the article memory and assign it to the output queue of one of the text data channels.

Command: ^A0<sp>name<sp>tc<sp>rc<sp>k/d<sp>o/h<sp>n/l<cr>
data<cr>data . . .data<cr>^C

Default: ^A0<sp>name<sp>T1<sp>9999<sp>D<sp>O<sp>L<cr>

The parameter **name** identifies the name of the article. The article can subsequently be referred to by its name. If the article name already exists, the new article with the same name will replace the previous article.
The **tc** parameter identifies the text channel number that the article will be placed into.

The **rc** parameter identifies the number of times the article will be repeated. Values of 9999 or FFFF indicate that the article should be repeated indefinitely. An article's repeat count will be decremented each time the article is output in each output data stream.

The **k/d** parameter identifies whether the article should be kept or deleted when it has been transmitted the specified number of times.

The **o/h** parameter identifies whether the article should be placed into the output queue or whether it should just be held in memory for later use.

The **n/l** parameter identifies whether the article should be placed as the first article in the output queue or the last article in the queue.

All subsequent data is part of the article until ^C is received. The encoder will respond to each line of the article with a '>' prompt while the article is being defined.

Examples: ^A0<sp>Test<sp>T1<sp>5<cr>
This is the first line<cr>
and this is the last line ^C

A two line article called 'Test" will be placed at the end of the Text 1 output queue. The article will be deleted after it is output 5 times.

5.4.2. Output Article

This command allows the user to put an existing article (defined by the Input article command) into the output queue of the specified text data channels. An article may be put into an output queue more than once.

Command: ^A1<sp>name<sp>tc<sp>rc<sp>k/d<sp>o/h<sp>n/l<cr>

Default:

tc	last text channel the article was sent to
rc	current repeat count
k/d	last keep/delete status specified for the article
o/h	O
n/l	last next/last status specified for the article

The parameters have the same meaning as for the Input article command. If the **o/h** parameter is H then this command may be used to change other attributes of the article without outputting it.

The parameter **name** specifies the name of a previously defined article.

If the parameter **k/d** is D, and the article is currently being output, it will not be removed until it has been completely output.

Examples: ^A1<sp>Test<sp>T2<sp>5<sp>D<cr>

The article called ‘Test” will be placed at the end of the Text 2 output queue. The article will be deleted after it is output 5 times.
^A1<sp>Test<sp>T2<sp>9999<sp>H<cr>

The article called ‘Test” will have its repeat count change to indefinite. It will not be placed into any of the output queues.

5.4.3. Delete Article

This command allows the user to remove an article from all output queues. If the article is currently being output, it will not be removed until it has been completely output.

Command: ^A4<sp>name<sp>k/d<cr>

Default:

k/d last keep/delete status specified for the article

The parameter **name** identifies the name of the article.

The parameter **k/d** indicates whether the article will be deleted from memory or not.

Examples: ^A4<sp>Test<sp>D<cr>

The article called ‘Test” will be removed from all output queues and deleted from memory.

5.4.4. Queue Articles

This command will delete the entire specified output queue and replace it with the articles named (if any). The user enters the names of the articles separated by <cr> in the order that they are to appear in the output queue. The encoder continues to add articles to the queue until it receives a ^C. The article names may be edited by using the ^H (backspace) and ^X (delete line) characters before the <cr> is input.

Command: ^A8<sp>tc<cr>
name<cr>name<cr>....name<cr>^C

Default: none

The parameter **tc** identifies the text channel number of the output queue the articles will be placed into.

The parameter **name** identifies the name of each article to be placed in the queue. If no article names are given, the specified article output queue is cleared and no articles will be output in that data stream.

Example: ^A8<sp>T1<cr>TEST<cr>TEST2^C

Puts the previously defined articles named TEST and TEST2 into the output queue for Text Channel 1.

5.4.5. Display Article Status

This command allows the user to view the list of articles stored in the article memory and display their status. The status includes the article name, repeat count, (9999 if infinite) the keep/delete status, and the memory storage needed for the article. The first line of the article will also be shown. A "..." will indicate multiple lines of text.

Command: **^A9<cr>**

Default: none

Examples: ^A9<cr>

Returns:

```
Article Status:
Name       Repeat K/D size text
test1      009999 D 000031 "this is a sample"...
test2      009999 D 000014 "second article"
```

5.4.6. Display Output Queue

This command displays the articles in all 5 output queues in the order in which they reside in the queues.

Command: ^AB<cr>

Default: none

Examples: ^AB<cr>

Returns a list of articles such as the following:

```
Output Q: T1
test1
Output Q: T2
test2  test2
Output Q: T3

Output Q: T4

Output Q: XDS
```

5.5. EXTENDED DATA SERVICES

Extended Data Services (XDS) information is encoded into Field 2 and is intended to supply program related and other information to the viewer. XDS data can inform the viewer of such information as current program title, length of show, type of show, time left in show, and V-Chip-compatible program rating information.

The XDS output stream consists of a distinct XDS packet for each type of information. Each packet consists of a 1 byte class, a 1 byte type, one or more informational characters, a 1 byte end of packet code, and a 1 byte checksum.

XDS packets are stored in the article memory and output in the XDS data channel in Field 2. These packets are placed into the XDS output queue in the order specified by the user and inserted into Field 2 according to the space available. CEA-608-B specifies that when there is caption or XDS information in field 2, then there must be at least a null caption signal present in field 1 as well. When encoding into field 2, the MIO–CCE–4K/3G automatically detects whether there is a caption signal present in field 1. If necessary, it will turn on the Field 1 keyer automatically and turn it off again when upstream field 1 captions resume.

The computer uses an ASCII hex notation in describing the XDS packet id and data to the caption encoder. For example, to specify the letter A enter a 4 followed by a 1 (the hex ASCII code for A is 41)

The XDS packets are deleted from memory when they have been transmitted the specified number of times. XDS packets will be lost from the encoder's memory in the event of a power loss. The MIO–CCE–4K/3G uses an advanced memory allocation scheme that allows it to store a virtually unlimited number of XDS packets at one time. The only limit is the total amount of random access memory available.

Upstream XDS packets will be blocked in the output queue by packets of the same type.

5.5.1. Input XDS

This command allows the user to input an XDS packet into the caption encoder's article memory.

If an XDS packet with identical **edsid** exists it will be deleted and replaced with the new packet definition.

Command: ^AP<sp>edsid<sp>rc<sp>data...data<cr>

Default: none

The **edsid** parameter identifies the XDS packet id. The XDS packet can subsequently be referred to by its packet id. If the XDS packet already exists, the new packet with the same id will replace the previous XDS packet. The **edsid** is entered in ASCII hex notation. For example, to enter a packet id with a class of 01h and a type of 23h, enter a 0 followed by a 1 followed by a 2 followed by a 3. The leading zero of the class is optional.

The **rc** parameter identifies the number of times the packet will be repeated. Values of 9999 or FFFF indicate that the packet should be repeated indefinitely. A packet's repeat count will be decremented each time it is output.

The parameter **data** is the information bytes of the packet. This data is entered in ASCII Hex format. For example, to enter the letter A enter a 4 followed by a 1 (the hex ASCII code for A is 41)

The XDS article length is checked for the following commonly used articles: Program ID (0101), V-Chip Content Advisory (0105), Station Call Letters (0502), and Time Zone (0704). If the article length is not in the valid range for the packet type, the encoder will reject it. This length checking does not apply to XDS packets from upstream, only XDS articles that are entered using the ^AP command from a serial port.

Examples:

^AP<sp>0103<sp>10<sp>41424344<cr>

Sets the program name packet to ABCD and repeat packet ten times.
^AP<sp>0701<sp>9999<sp>456A4548474A<cr>
Time Of Day packet indicating the current UTC time is 10:05 am on Saturday, October 5th, 2002. DST is ON. The packet will be repeated indefinitely.

Time of Day and Time Zone packets behave differently than other XDS articles when defined. The defined packet contents will be ignored; the encoder will generate the time of day packet data from the current internal time.

^AP<sp>0105<sp>9999<sp>486D<cr>

Program rating packet setting the rating system to “TV Parental Guideline”, rating of TV-PG with V and L bits set. The packet will be repeated indefinitely. Other V-Chip ratings may be encoded using the information in Appendix A.

5.5.2. Blocking Upstream XDS Packets

Upstream XDS packets can be removed entirely from the data stream, without having to insert new XDS data of the same type. This is accomplished using a variation of the ^AP serial interface command. This feature is particularly useful for removing unwanted Time-of-Day packets, Time Zone packets, etc. off of pre-encoded material.

To remove a specific XDS packet, use the ^AP command to enter an XDS article with the packet id of the packet you want to remove, a repeat count of 9999 and article text consisting of the single character "R", or the equivalent ASCII HEX "52".

Examples:

^AP<sp>0701<sp>9999<sp>52<cr>
^AP<sp>0701<sp>9999<sp>R<cr>
Both variations block upstream Time Of Day packets

^AP<sp>0701<cr>
Allows upstream Time Of Day packets to be passed through

Upstream XDS blocking instructions are not saved through power loss.

5.5.3. Queue XDS Packets

This command will delete the entire specified XDS output queue and replace it with the packets named (if any). The user enters the packet ids of the XDS packets separated by <cr> in the order that they are to appear in the output queue. The user enters the packet id of each packet separated by <sp> in the order that they are to appear in the output queue.

Command: ^A8<sp>F2 edsid<sp>edsid...edsid<cr>

Default: none

The parameter **edsid** identifies the packet id of each packet to be placed in the XDS queue. If no packet id is given, the XDS output queue is cleared and no XDS information will be output.

5.5.4. Delete XDS Packet

This command allows the user to remove an XDS packet from the article memory. If the XDS packet is currently being output, it will not be removed until it has been completely output.

Command: ^AP<sp>edsid<cr>

Default: none

The **edsid** parameter identifies the packet to be deleted.

Examples: **^AP<sp>0103<cr>**
The program name packet will be removed from memory.

5.5.5. Inserting XDS Articles into Non-Volatile Memory

The MIO–CCE–4K/3G can store XDS articles in non-volatile memory, so that in case of a power failure, XDS information can be retained. All XDS articles starting with “05” (channel class) and “07” (miscellaneous class) are preserved in non-volatile memory. Other classes are not stored through a power low, and must be re-entered by the user upon power up.

5.6. COMM PORT CONTROL COMMANDS

The MIO–CCE–4K/3G enables the communication ports to simultaneous access the caption keyers. This can be the effective equivalent of multiple caption encoders linked in a series. By using a single video keyer, these encoder models provide the added advantage of minimizing the delays and the impact on the video quality. Several commands are provided in order to prevent data conflicts and allow the user to control which ports can affect the data. The caption encoder maintains a permission list that indicates which ports will be allowed to alter various kinds of data. The permissions for each port can be set from VistaLINK® menus or they may be set from the communication control ports. The permission list is maintained in non-volatile memory. The data types are denoted as follows:

Data Type	C1	captions field 1
	C2	captions field 2
	T1	text field 1
	T2	text field 2
	XDS	extended data services

When multiple ports are permitted access to a particular data type, conflicts will be resolved on a "first come, first served" basis. The caption encoder maintains a list of which ports are active for each data type.

Normally, the various keyer commands (such as ^A2, ^A3, ^A6, ^A7) will set and clear the active status automatically. To obtain maximum compatibility with existing software, these commands will exhibit the following special behavior:

If a port does not have permission for the full field 1, but does have permission for the captions in field 1, then the command will not be denied, but will revert to the C1 form of the command.
For example, if Port A has permission for CF1 only, and a ^A3<cr> or ^A3 F1<cr> is issued, then although Port A does not have permission for the full field 1, the command will not be rejected. Instead, the command will be treated as though ^A3 C1<cr> had been sent.

5.6.1. Show Port Permission Maps

This command will report the permission map for each port. The permission map controls what data types a port is allowed to become active in. (e.g., captions field 1, text field 2, XDS, etc.)

Command: ^AQ<cr>

Example result:

Permission Map
PORT A: C1 C2 T1 T2 XDS
PORT B: C1 C2 T1 T2 XDS
PORT C: C1 C2 T1 T2 XDS
PORT D: C1 C2 T1 T2 XDS OFFLINE

This example shows that all ports are permitted access to all data types (the factory default setting) and the Port D modem is offline.

Permission Map
PORT A: C2 T1 T2 XDS
PORT B: C1 T1 T2 XDS
PORT C: C1 C2 T2 XDS
PORT D: C1 C2 T1 T2 ONLINE

This example shows that Port A is denied access to captions in field 1, Port B is denied access to captions in field 2, Port C is denied access to text in field 1 and Port D is online and is denied access to extended data services.

5.6.2. Alter Port Permission Maps

This command will alter the permission map for any port by adding or subtracting various data types.

Command: ^AQ<sp>pn<sp>-dt…dt…dt<cr>

Default: none

Example:

^AQ PB – XDS –T2 –C2 C1 T1<cr>
This command will disallow Port B from all field 2 data types, and enable Port B for captions and text in field 1.

^AQ C1<cr>
This command will allow the current port to access captions in field 1. Permissions for other data types remain as previously set.

^Au<cr>
^AQ PD – XDS –T2 –C2 –T1 C1<cr>
^AQ PB –XDS –T2 –C2 -C1 T1<cr>
^AQ PC –T2 –C2 -C1 -T1 XDS<cr>

These commands show a typical application which places the MIO–CCE–4K/3G in stream mode, allows modem Port D to process captions in Field 1, allows Port B to process text articles in field 1, and enables Port C for extended data services.

5.6.3. Show Port Active Maps

This command will report the active map for each port. The active map controls what port has control of a data type.

Command: ^AO<cr> (capital letter 'O')

Example result:
Active Map
PORT A: C1
PORT B: C2
PORT C:
PORT D: XDS ONLINE

This example shows Port A is actively controlling the captions in field 1, Port B is controlling the captions in field 2, Port C is not actively controlling any data, and the Port D modem is online and is controlling the extended data services.

5.6.4. Alter Port Active Maps

This command will alter the active map for any port by adding or subtracting various data types. The optional override parameter ('O') forces other control ports to relinquish control of the specified data type.

Command: ^AO<sp>pn<sp>-dt…dt…dt<sp>ovr<cr>

Default: none

Example:

^AO PB –C1<cr>
This command will remove the active indication for Port B from field 1 captions.

^AO C1<cr>
This command will indicate that the current port is active in the captions in field 1. Activity for other data types remain as previously set.

^AO C1 O<cr>
This command forces the current port to be active in field 1 captions. Activity for other data types remain as previously set. If any other control port is active in CF1 will be reset.

5.6.5. Reset Port

This command will reset a port. This command immediately clears the input and output data queues and resets the MIO-CCE-4K/3G to the Transparent State in Field 1 and Field 2. Article and XDS output queues are not reset by this command. They must be explicitly reset by using the queue articles and queue XDS commands. Since other control ports may be simultaneously sending data, this command only affects the fields and data types that have not been appropriated by other control ports. To reset all communication ports, see the Reset Encoder (^F^F) command in section 6.3.2.

Command: ^Ar<sp>pn<cr>

Example: ^Ar PB<cr> Resets Port B

6. UPGRADE PROCEDURES

6.1. FIRMWARE UPGRADE

Using the WebEASY® on a web interface is the fastest and recommended way to load the firmware onto the MIO-CCE-3G/4K modules.

On the top of the web page for the MIO-CCE-3G/4K modules, there is a button labelled Upgrade. The Upgrade tab is used to check current firmware version and upload the latest firmware (Figure 5-1).

Figure 6-6-1 : 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 needs to download the firmware image file.

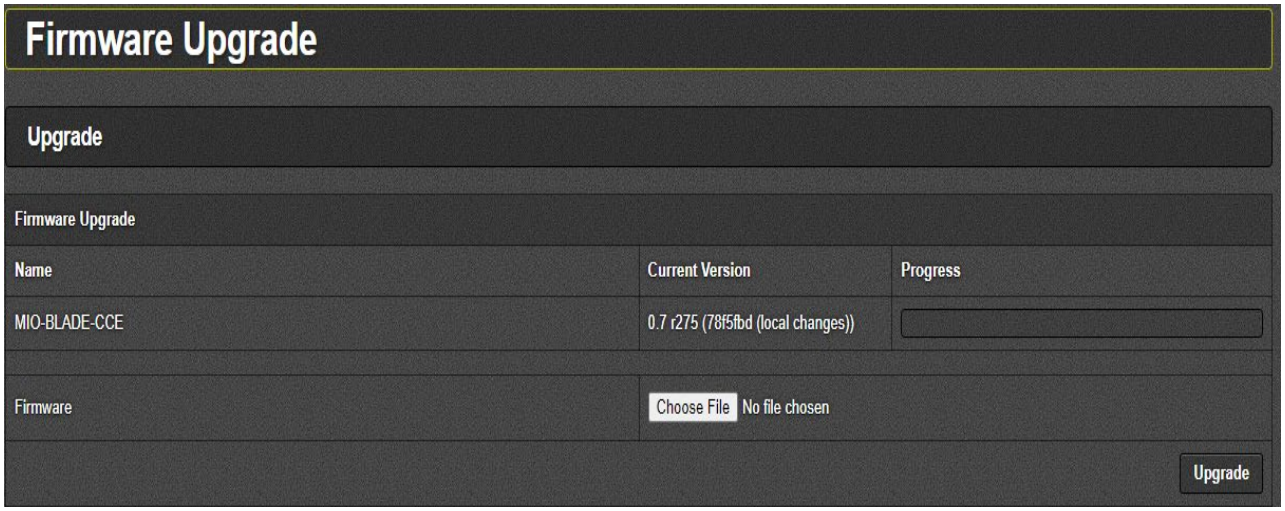


Figure 6-6-2 : WebEASY® - Firmware Upgrade Menu

Click choose file and browse to locate image file (Figure 5-3). Once selected, click open to advance to next step. Click upgrade and watch progress bar for status. Once completed, the device will automatically restart.

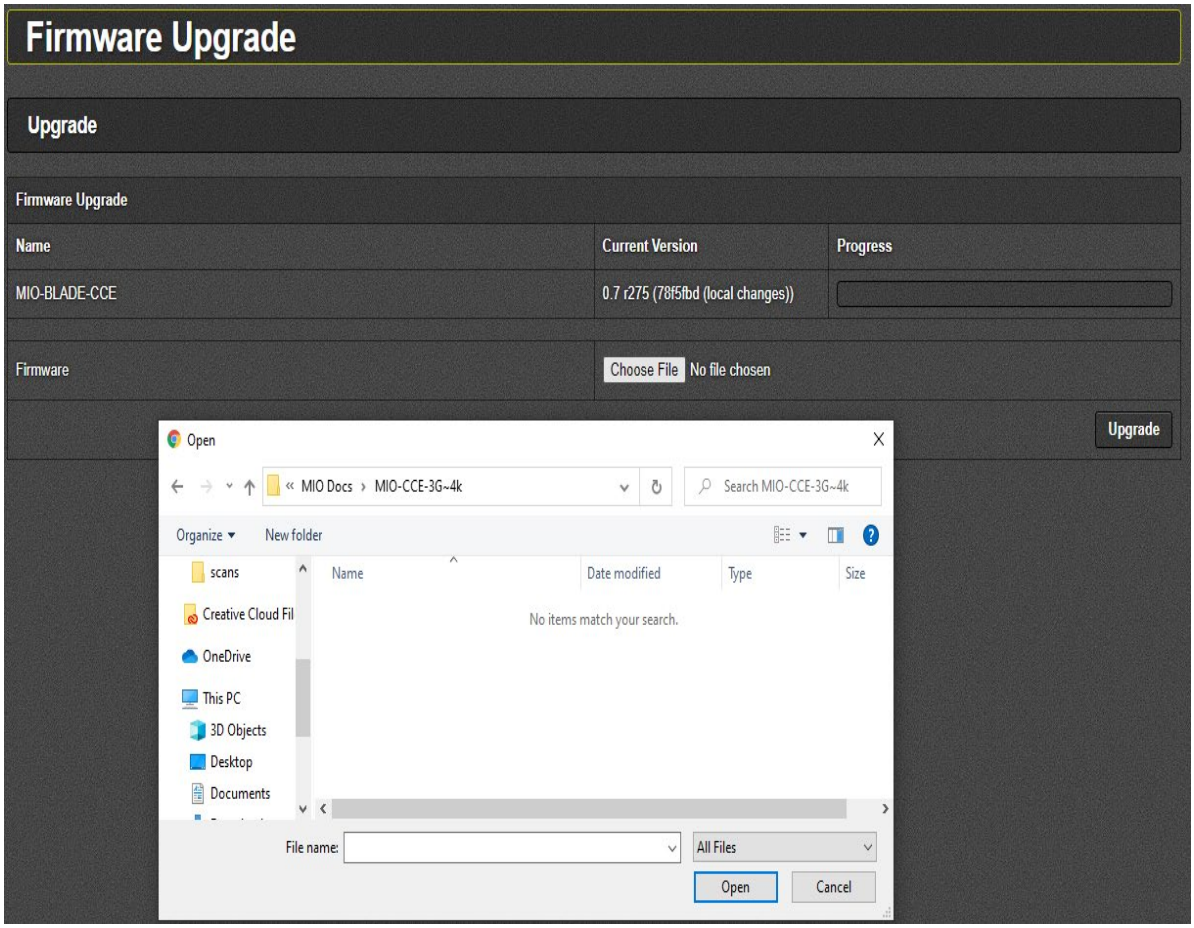


Figure 6-6-3 : WebEASY® - Firmware Upgrade Menu

7. TROUBLESHOOTING

7.1. ANSWERS TO FREQUENTLY ASKED QUESTIONS

7.1.1. Which Serial Port Should I Connect To?

Any serial port can be used for typical captioning functions, since they all use the same Control-A serial protocol. All three serial ports are configured from the factory to work with an off-the-shelf null-modem cable. Ports A, B, and C are all configurable to support both RS-232 and RS-422 communications.

If the user wishes to connect to an ATSC encoder, Port B must be used. Port B support SMPTE-333M and Grand Alliance protocols, configurable using VistaLINK® menu system of the MIO-CCE-3G/4K. Please see section 5.8.

7.1.2. There is No SDI Video Present on the SDI Output

The MIO-CCE-3G/4K includes video bypass relays to ensure that video is passed, even when the unit is powered-down. Make sure that your SDI source is connected to the BNC connector marked INPUT A/B, and the primary SDI video output is connected to the BNC connector marked HD/SDI BYPASS PGM OUT. If you still see no video, try the following:

1. Activate the appropriate A or B bypass relay.
2. Connect your SDI source to the SD-SDI IN connector.
3. Look for video out of the SDI BYPASS PGM OUT connector.

If there is still no SDI video passing through the unit, check for presence of SDI video upstream, and check for cabling problems.

7.1.3. How Do I Check if Captions are Being Processed?

7.1.3.1. Control A Protocol Test Using a Terminal Program

Control-A protocol can be used to determine if captions are processed and available out of Ports A, B, or C. Please ensure the latest firmware is downloaded from www.evertz.com and installed in the MIO-CCE-3G/4K.

Procedure:

- Connect a null modem cable to Port A, B, or C and to the RS-232 communication port of a PC.
- Begin a Terminal Program (Windows Hyper-terminal) and configure the communication settings to the following:

Baud	9600
Parity	none
Data bits	8
Stop bits	2
Flow Control	None

- Make sure captions are present in the up-stream SD-SDI and/or HD-SDI video or enable the CEA-608 Test Message of the MIO-CCE-3G/4K.
- Turn the MIO-CCE-3G/4K on.
- Using VistaLINK® menu system set the desired port to Control A protocol.

- Set the Port settings to match the settings in Hyper-terminal as shown above.
- Press ENTER on the keyboard and ensure you see an asterix (*) prompt every time you push the ENTER key.
- If you do not see the asterix (*) prompt, communication has not been established between the MIO-CCE-3G/4K and PC. Begin from the beginning of this procedure and ensure all settings are correct.
- At the prompt with the *asterix in Hyper-Terminal, type in the following command:
  Ctrl + a (the control button on the keyboard plus the letter A button)
  5
  SPACE (space bar)
  f
  1
  You will not see this displayed at the prompt.
- Press the ENTER key
- This Control A command is further outlined in section 6.3.4
- All captions in field 1 should now be displayed in HyperTerminal.
- To turn this feature off, type in the following command
- CTRL + g (Control key on the keyboard and the G key)
- The captions will stop scrolling

This test shows the MIO-CCE-3G/4K is processing captions and allows the user to verify this through Hyper-Terminal.

If captions are not displayed, check the following:
- Ensure the command was entered properly.
- Are captions present in the upstream video?
- Turn on the CEA-608 Test Message via VistaLINK®

7.1.4. There are No Captions Present Out of the ATSC Encoder

Make sure the correct communication cable is used between the MIO-CCE-3G/4K Port B and the ATSC encoder. A null modem cable is used in almost all cases.
Avoid using gender changers, “home made” cables, or distribution boxes between the MIO-CCE-3G/4K and ATSC encoder. Ensure a direct path is provided from the MIO-CCE to the encoder with a proper working cable.

Ensure Port B is set to the proper protocol and baud rate using VistaLINK® menu.

Note: Only Port B supports SMPTE-333M and Grand Alliance protocol.

7.1.5. What Baud Rate and Port Settings Should I Use?

While the unit is capable of running at 57.6k baud on all internal serial ports, it is not necessary to run at the fastest baud rate possible for most captioning operations. NTSC captions are encoded at a maximum of 60 characters per second in each field. A serial port set to 1200 baud can transfer data at up to 120 characters per second including 7-bits of data, start, stop and parity bits. This is adequate for most captioning applications since the communications overhead is generally very low.

Some older PC's do not function correctly at over 19.2k baud, especially when running under Windows. Many PC's also have difficulties at 19.2k baud and above when using only the software (XON/XOFF) flow control method. Try turning on hardware (CTS/RTS) flow control on your computer if the captioning software supports it, and/or reducing your communications baud rate. Make sure that you alter your captioning computer's serial port settings to match those of the caption encoder.

7.1.6. Captions are Not Being Encoded At All

If there is no option in the captioning/teleprompter software for the Evertz encoder, configure your software to communicate with an EEG 270, EEG 370 or EEG 470 model Smart Encoder. The Evertz caption protocol is compatible with these units.

Make sure that the caption encoder unit is set to the correct video type, 525-60 for component SD-SDI.

Check that the caption keyer is turned on.
Check your serial port communications settings. Make sure that these are identical between the caption encoder and the attached captioning computer.

Check that the unit is receiving data from the serial port or modem.

Try enabling the built-in CEA-608 test message. If you still cannot see captions, then it is likely that downstream equipment is corrupting the caption data, or your caption decoder is not functioning correctly.

7.1.7. Captions are Not Being Encoded Correctly

If there is no option in the captioning/teleprompter software for the Evertz encoder, configure your software to communicate with an EEG 270, EEG 370 or EEG 470 model Smart Encoder. The Evertz caption protocol is compatible with these units.

Make sure that the caption encoder unit is set to the correct video type, 525-60 for component NTSC.

Check your serial port communications settings. Make sure that these are identical between the caption encoder and the attached captioning computer.

Check that the unit is receiving data from the serial port or modem.

If certain accented and special characters do not display correctly, this is likely the fault of the caption decoder being used to display the captions. Some decoders do not support the entire character set for captions.

Certain teleprompter software packages have been known to not encode accented characters correctly. Please contact your software provider for possible updates before contacting Evertz technical support.

7.1.8. How Can I Block Upstream Captions?

Depending on the user's specific needs, there are many ways to accomplish this. If all upstream captions are to be blocked, the recommended approach is to issue the serial port commands ^A6 F1 and ^A6 F2 to place both Field 1 and Field 2 into NULL STATE. See section 6.3.13.

If only a particular data channel is to be blocked, such as Text Channel 2, execute the serial command ^A6 T2 to place this particular channel in NULL STATE. To block all upstream XDS material, issuing ^A6 TX will put only the XDS stream into NULL STATE. Presently there is no way to block specific XDS packet types, unless these are being replaced with updated packets of the same type by the caption encoder. If an entire field is to be blocked, use ^A6 F2 to place all of Field 2 in NULL STATE.

7.1.9. How Can I Pass Upstream Captions?

If upstream captions are being blocked, the user's captioning software might have failed to relinquish control of the encoder so upstream captions may pass.

If captioning software is leaving the unit in DIRECT STATE or REAL TIME STATE or NULL STATE when it is sitting idle, this issue must be resolved in the caption software itself.

7.1.10. My Modem Connection Hangs-Up Unexpectedly

The following can cause unexplained hang-ups on a modem connection:

RAIN - If there has been any significant rainfall during this time, moisture can get into the lines and cause power hums and other sorts of phenomenon. This can cause the DC level of the phone line to vary, which modems can interpret as loss of carrier.

DISTANCE - If the captioner is a long distance from the CO (Central Office) where they are near the limit of transmission, dropouts can occur if there is not a line booster in place. If there is a line booster, this can also be a problem if there are grounding issues, etc.

CAPTIONERS MODEM - If the initialization string is setup incorrectly, this can cause the modem to not function correctly. The user may want to check the modem manufacturer for the recommended set-up for their particular modem so it is capable of operating in the 1200 to 2400 baud range. Some people that use US Robotics 57.6k modems have reported difficulties connecting at lower baud rates due to these setup strings.

OTHER SOFTWARE - If there is any other software on the system that uses the modem, it may have changed the initialization string or be interfering with the modem. On computers that use a COM-port mouse, the mouse may also interfere with the modem operation if it is configured incorrectly.

READ THE MANUAL - Be sure the captioners know their system inside and out. They should, at minimum, be able to supply what their system configuration is.

CALL WAITING - If this service is installed on the captioner's phone line, it MUST be disabled before using the modem. If an outside caller tries to call the phone line that the modem is connected to, the tone that is generated will disrupt modem communications, resulting in loss of carrier.

ONLY CONNECT TO POTS (Plain Old Telephone System) - For a reliable telephone connection to the caption encoder a direct telephone line must be used. This line must not pass through a PBX or similar key device.

Today, many telephone companies digitize the signal within their networks, unbeknownst to the customer. You may be able to establish a reliable connection to the caption encoder at 1200 or 2400 baud, but no higher. (This speed is acceptable for most captioning applications.) In other cases, you may need to ask the telco for a phone line with higher bandwidth, possibly at extra charge.

ENSURE THE LATEST FIRMWARE IS INSTALLED - From time-to-time, Evertz may release updated firmware for the MIO-CCE to add new features or improve performance. It is recommended to always check for firmware updates when you encounter a problem. The firmware release notes will provide some guidance as to whether a firmware upgrade will address your specific problem.

7.2. BEFORE YOU CALL EVERTZ TECHNICAL SUPPORT

Check for any product upgrades that may address your problem at the Evertz web site (www.evertz.com) and consult your software vendor.

After reviewing the website and calling Evertz customer service, you will be asked for specific technical information, which should be prepared in advance for speedy assistance:

- Serial number of unit.
- Firmware version of the caption encoder. This is displayed in VistaLINK® via Help...version information.
- Which serial ports and modem ports (A through E) are being used on the encoder?
- What captioning or teleprompter software is being used to control the encoder? (manufacturer, product name, revision number)
- Is this a new installation, or was the unit functioning in your system previously?
- Did the problem occur after installing some new hardware or software?

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