

# EEGHD1492

## HD Encoder Frame Card



## Product Manual

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The revision date for this manual is April, 2023.

## **1 Introduction**

### **1.1 Product Description**

The HD1492 Encoder Card brings the functionality of EEG's industry standard Smart Encoder to the openGear®platform, providing closed captioning and XDS encoding in a single modular frame card operating on the openGear®platform. The frame card utilizes the user friendly DashBoard software, which is available for Windows, Mac and Linux operating systems and streamlines setup of the HD1492.

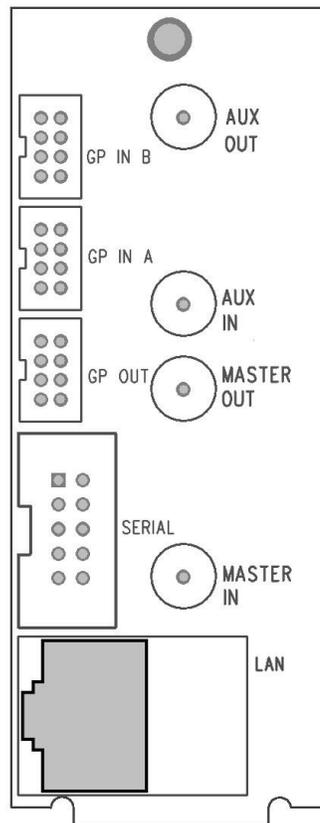
Like the 1RU HD492, the HD1492 streamlines and integrates the Line 21/HD-VANC encoding process into one powerful solution, supporting a wide variety of powerful ancillary data software on-board. The HD1492 includes connection software for EEG's iCap™ Realtime Captioning System, and in combination with the ComCC-1250 card can provide an unprecedented level of reliable and redundant connectivity solutions.

## 2 Installation

### 2.1 Rear Modules

There are two back panel configurations available for the HD1492. The single-width rear panel is shown here, followed by a guide to the connectors it contains.

#### 2.1.1 Single-Width Rear Module



**MASTER IN**

Master video input. Accepts SMPTE 259M

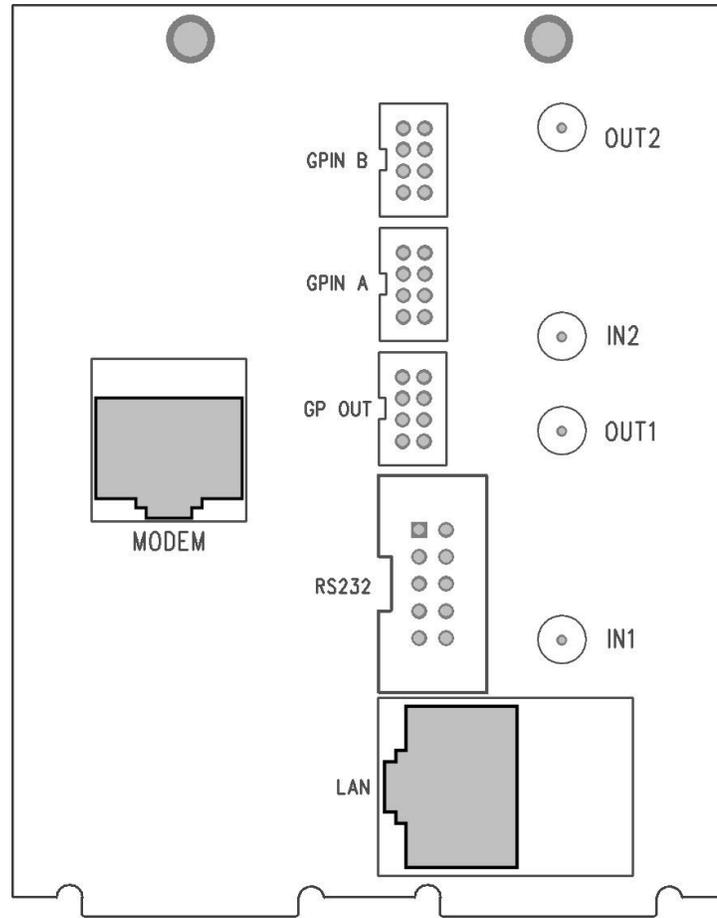
SD-SDI, SMPTE 292M HD-SDI, or SMPTE 424M 3G-Level-A SDI.

**AUX IN** Auxiliary video input. Can be used as a source of caption data when connected to a captioned 3G-SDI, HD-SDI, or SD-SDI video source. Caption data from the Aux Video In will be up-converted or downconverted as necessary for encoding onto the Master Video signal. If caption data is present at both the Master Video In and the Aux Video In, the signal with HD data will take precedence.

<b>MASTER OUT</b>	Program video output with relay-bypass protection.
<b>AUX OUT</b>	Auxiliary video output with relay-bypass protection.
<b>GP IN A and GP IN B</b>	Two Molex 87831-0841 connectors, each containing 4 GPI inputs. See Appendix A for more information regarding GPIO usage.
<b>GP OUT</b>	Molex 87831-0841 connector containing 4 GPI outputs. See Appendix A for more information regarding GPIO usage.
<b>SERIAL</b>	Connector for cable containing two DB-9 (RS-232) serial ports labeled P1 and P2. Both serial ports can be used as inputs for configuration.
<b>LAN</b>	1000-Base Ethernet port for connection to LAN. After configuring your HD1492's network settings in DashBoard (see below), you can view the Web Configuration site for your card by navigating to its local IP address in your web browser.

### **2.1.2 Double-Width Rear Module**

The double-width rear module provides a modem connector, in addition to the I/O included on the single-width rear module, and takes up 4 card slots in the openGear® frame, instead of 2.



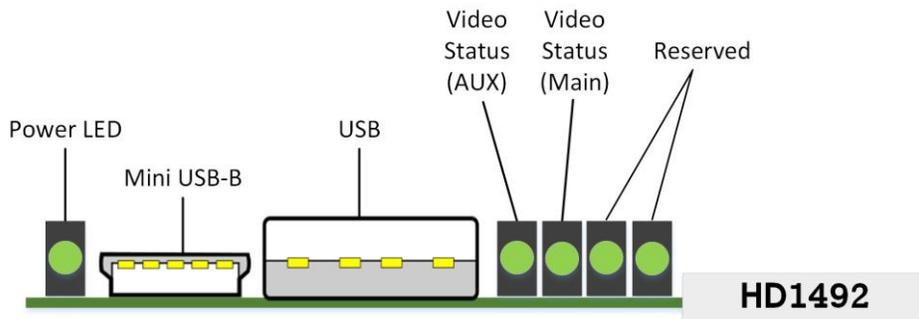
- IN1** Master video input. Accepts SMPTE 259M SD-SDI, SMPTE 292M HD-SDI, or SMPTE 424M 3G-Level-A SDI.
- IN2** Auxiliary video input. Can be used as a source of caption data when connected to a captioned HD-SDI or SD-SDI video source. Caption data from the Aux Video In will be up-converted or down-converted as necessary for encoding onto the Master Video signal. If caption data is present at both the Master Video In and the Aux Video In, the signal with HD data will take precedence.
- OUT1** Program video output with relay-bypass protection.
- OUT2** Auxiliary video output with relay-bypass protection.
- GPIN A and GPIN B** Two Molex 87831-0841 connectors, each containing 4 GPI inputs. See Appendix A for more information regarding GPIO usage.
- GP OUT** Molex 87831-0841 connector containing 4 GPI outputs. See Appendix A for more information regarding GPIO usage.

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- RS232** Connector for cable containing two DB-9 (RS-232) serial ports labeled P1 and P2. Both serial ports can be used as inputs for configuration.
- LAN** 1000-Base Ethernet port for connection to LAN. After configuring your HD1492's network settings in DashBoard (see below), you can view the Web Configuration site for your card by navigating to its local IP address in your web browser.
- Modem** Standard phone jack data port. Connect to a phone line to enable dial-up captioning. This feature is optional on the HD1492.

### 3 HD1492 Operation

#### 3.1 Front Panel

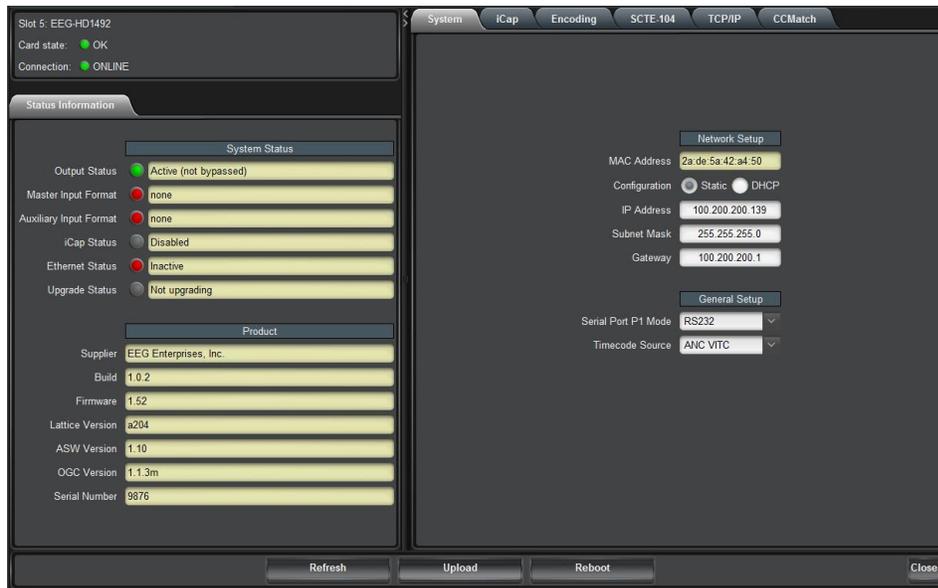
The front of the HD1492 card is depicted in the following diagram:



- Power LED** The power LED will be green when the card is receiving power from the frame.
- USB Connectors** Reserved for future use.
- Video Status (AUX)** This LED will be off when there is no video present on the auxiliary input. When HD or 3G video is present, it will be green, and when SD video is present, it will be orange.
- Video Status (Main)** This LED will be red when there is no video present on the main input. When HD or 3G video is present, it will be green, and when SD video is present, it will be orange.

### 3.2 DashBoard Menus

The DashBoard software is used to configure encoder settings, networking, and perform additional basic configuration for the frame card. It can be downloaded from Ross Video: <https://www.rossvideo.com> Once you have successfully installed the DashBoard tool, open the program to find information about the HD1492 and to configure your card.



There are two main sections in the DashBoard interface: the Status information on the left side and the Setup menu on the right side. At the bottom of the interface, you will find the **Upload** button, which can be used to upgrade your HD1492's DashBoard interface firmware, and the **Reboot** button, which can be used to reboot your HD1492.

The upper section on the left shows the Card State and the Connection status, each of which has an indicator light and description of the card's status. There is a more detailed tab labeled **Status Information** below the two basic indicators that provides information about the card's version and its current setup configurations.

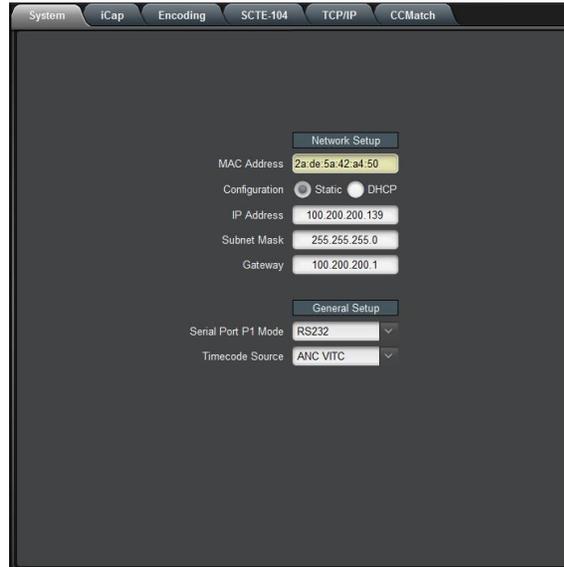
The **System Status** section shows what video types are present and the current status of the Ethernet connection. Output Status displays the mode that the encoder is operating in; the icon will be green when the unit is in active operating mode and will be red when the Encoder is in Relay Bypass mode. Master Input Format displays the video type detected on the master video input, including format information for HD video, while Auxiliary Input Format indicates the video type detected on the auxiliary video input, including format information for HD video. The Upgrade Status field displays information about whether the encoder is currently loading an upgrade.

The lower section entitled **Product** displays identifying information about the hardware and software versions of the card. This section displays the supplier, the build number, the firmware number, and the ASW version to identify the software installed and the serial number of the card.

The setup section in the right half of the tool is broken up into multiple tabs: System, iCap, Encoding, SCTE-104, TCP/IP, and CCMatch. Note that the SCTE-104 and CCMatch tabs will only be present if your HD1492 has been licensed to use the respective software modules.

### 3.2.1 System

The System tab contains network configuration and general setup fields.



**MAC Address Configuration**

Displays the encoder’s MAC address.  
Selects between static and DHCP network settings.

**IP Address**

Selects the IP address the unit will be assigned on your LAN (read-only in DHCP mode).

**Subnet Mask**

Selects the bit mask used; this should match the mask used on your LAN (readonly in DHCP mode).

**Gateway**

Selects the address of the device that the unit will use to communicate outside of your LAN (read-only in DHCP mode).

**Serial Port P1 Mode**

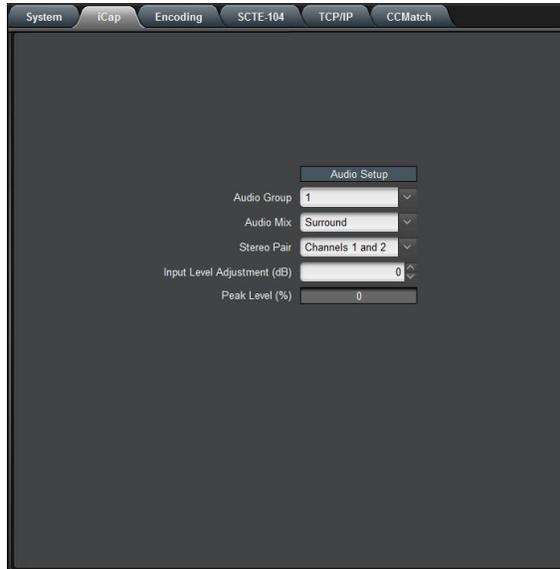
Selects the signaling mode used by the P1 serial port; options are RS-232, Sony-style RS-422, and EEG-style RS-422.

**Timecode Source**

Selects the timecode source for any applications requiring it; options are ANC VITC, DVITC Master, and DVITC Aux.

### 3.2.2 iCap™

The iCap™ setup menu allows configuration and monitoring of audio for iCap™.



**Audio Group**

Selects the SDI embedded audio channel group that the iCap™ mix is sourced from. Up to 4 channel groups can be carried on an SDI signal, though most commonly Group 1 carries the primary audio program.

**Audio Mix**

Selects whether the iCap™ mix is being created from a Stereo or Surround channel group. Choose “Stereo” to select a mix of the left and right channels (1 & 2 or 3 & 4 within the selected Audio Group, according to the Stereo Pair setting), or “Surround” to select a mix of the left, right, and center channels (1, 2 & 3 within the selected Audio Group).

**Stereo Pair**

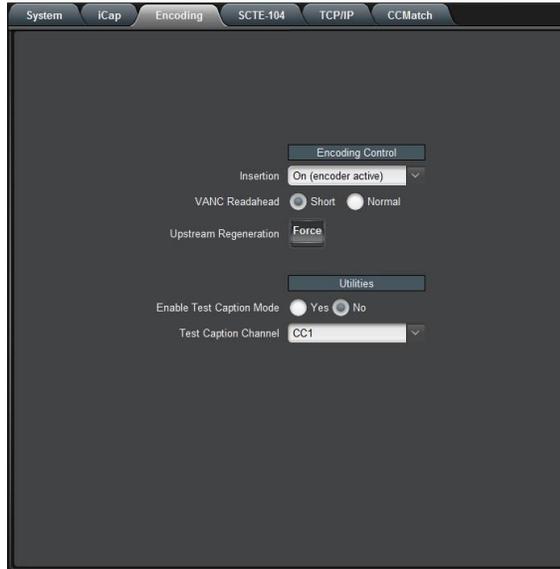
Selects whether the iCap™ stereo mix is being created from channels 1 & 2 or channels 3 & 4 within the selected Audio Group.

**Input Level Adjustment (dB)** Adjusts the audio input level without adjusting the output level of your source. The built-in digital input trim can boost or cut the audio input level by as much as 12 dB.

**Peak Level (%)** Dynamically displays the peak signal level at the audio input. For optimal sound quality, the peak level should reach at least 60% across the screen.

### 3.2.3 Encoding

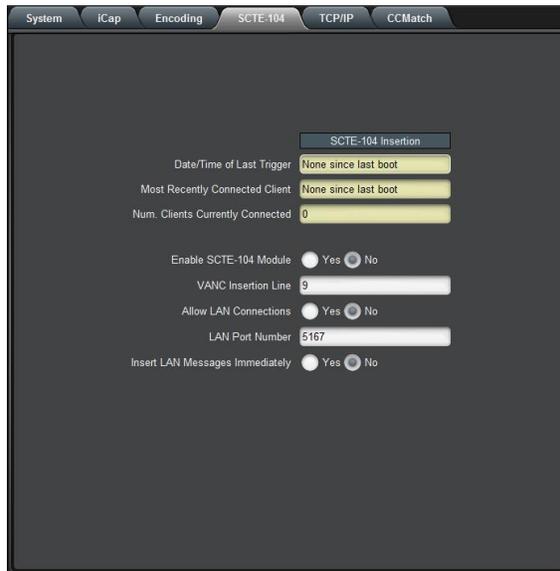
Various aspects of the operation of your encoder can be configured here.



- |                                    |   |
|------------------------------------|---|
| <b>Insertion</b>                   | Selects the operating mode of the encoder and specifies whether data is being inserted.   |
| <b>VANC Readahead</b>              | Determines the processing delay (excluding any effects from running CCMatch) between the input and output of the encoder. Select "short" for one fourth of a line of delay and "normal" for one line of delay.  |
| <b>Force Upstream Regeneration</b> | Manually returns the encoder to upstream "Regeneration" mode. This command can be used to resume passing of upstream caption data whenever it is being blocked by locally input caption data. Any captioners or devices inserting local data will be removed from caption mode immediately. |
| <b>Test Caption Mode</b>           | Allows you to enable a stream of caption text on the 608 channel selected below. The test captions will stop if any other port enters caption mode on the same channel and will automatically change the mode to <b>Disabled</b> .  |
| <b>Test Caption Channel</b>        | Sets the 608 channel on which test captions will appear if they are enabled.  |

### 3.2.4 SCTE-104

If your HD1492 is licensed to use SCTE-104 insertion application, the **SCTE-104** tab will be visible and will contain controls and status information for that application.



**Date/Time of Last Trigger**

Displays the date and time of the last SCTE-104 insertion trigger received.

**Most Recently Connected Client**

Displays the IP address and port of the last client to connect to the card over the LAN.

**Num. Clients Currently Connected**

The number of network clients currently connected to the SCTE-104 module will be displayed here.

**Enable Module**

Controls whether the SCTE-104 insertion application is active.

**VANC Insertion Line**

Determines which VANC line SCTE-104 packets will be inserted on.

**Allow LAN Connections**

If set to **Yes**, SCTE-104 insertion can be triggered via LAN connection on the port specified below.

**LAN Port**

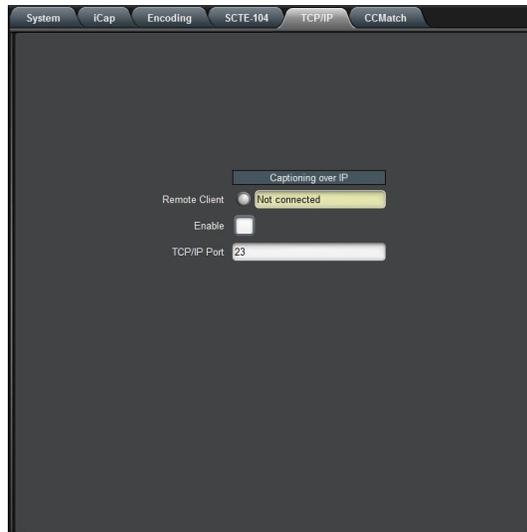
If the **Allow LAN Connections** setting is turned on, this field determines the port on which LAN connections will be accepted.

**Insert Immediately**

If set to **Yes**, a SCTE-104 packet will be inserted into VANC immediately when the application receives a LAN trigger.

### 3.2.5 TCP/IP

This tab allows you to configure an optional TCP/IP connection into your encoder, which provides an additional means of captioning, data entry, and monitoring via Smart Encoder commands.



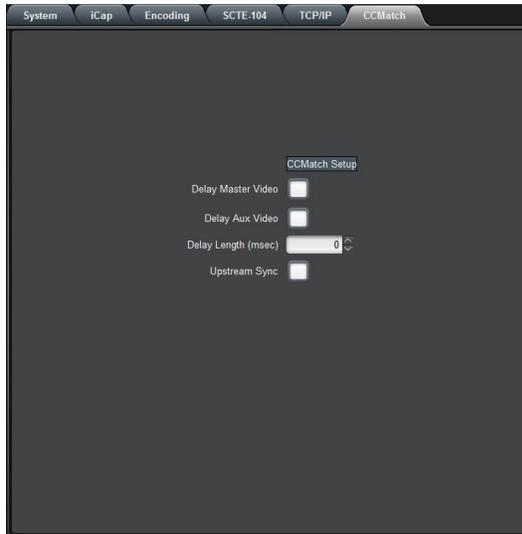
**Connection Status** When a connection into the specified TCP/IP port is active, this field will display **Connected**, with a green icon.

**Enable** Must be set to **Enabled** for connections to be accepted on the specified TCP/IP port.

**TCP/IP Port** This is the port on which remote connections to the encoder will be allowed, if you have enabled this feature; you can only change this value while the port is disabled.

### 3.2.6 CCMatch

If your HD1492 is licensed to use CCMatch application, the **CCMatch** tab will be visible and will contain controls for that application.



- Delay Master Video**                      Checking this box will delay the master video channel by the amount specified in the **Delay Length** field.
  
- Delay Aux Video**                      Checking this box will delay the auxiliary video channel by the amount specified in the **Delay Length** field.
  
- Delay Length (msec)**                  The delay, in milliseconds, for any video channels checked above. This should match the anticipated latency between your audio and your captions, before adjustment.
  
- Upstream Sync**                      Checking this box will cause upstream captions to be re-timed, in order to better synchronize them with your program audio.

### 3.3 Web Configuration

The Web Configuration interface enables you to access configurations for your HD1492 applications from any computer on your local network. Several web applications are installed at the factory for all HD1492 encoders: a Startup Setting editor, a web-based serial-emulation Terminal for entering Smart Encoder commands, system date/time configuration, and a documentation library.

Once you have configured your HD1492's network settings in DashBoard and connected it to your LAN via the port on the rear module, you can leave your encoder and open up a web browser on any PC on the same local network. Navigate to the IP address that you configured in DashBoard; for example, type 192.168.1.15 into the address bar of the browser if that is the address you entered into DashBoard. If you cannot navigate to the

page in your web browser, check with your network administrator that the IP Address and Subnet Mask you entered in DashBoard are valid parameters for your network, since individual settings vary.

Once the page has loaded, you will see a list on the top panel of the different web applications installed on your encoder. Click any of these links to navigate to the page for that application.

### 3.4 Using Smart Encoder Commands

Advanced configuration of the HD1492 can be set through the RS-232 serial ports labeled P1 and P2. The settings for these ports default to 1200 baud, 7 data bits, odd parity, and one stop bit. The HD1492 uses the EEG Smart Encoder command set. Encoder commands are recognized by a leading control code of <CTRL+A>, also represented by the ASCII hex code 01. The <CTRL+A> character is non-printing on most terminal screens, but on some it appears as a smiley face. An Encoder control command must end with a carriage return, which can be entered with the <ENTER> key on a keyboard or by 0D in ASCII hex.

To send the encoder commands through the serial input ports, connect a standard 9-pin straight cable between your PC's serial port and one of the DB9 connectors marked P1 or P2. You can now send commands to the encoder, from your PC, using a communications application such as HyperTerminal, which is bundled with most versions of Windows. The most basic Smart Encoder command, useful for checking the operation of your communication setup, is **<CTRL+A>?<ENTER>**. If your setup is working correctly, the Encoder will respond with its model name, firmware version, and serial number. If you have trouble communicating using HyperTerminal, always check to make sure that the settings in the Port Settings menu in HyperTerminal match the settings for the Encoder port you are connecting to.

In this manual, Encoder commands will be distinguished from other text by use of a bold font. Optional parameters will be enclosed in square brackets. Possible parameter values and default settings will be described in text or bullet points after the command is introduced.

#### 3.4.1 Local Entry Modes

Caption data entered into the Encoder must be associated with a particular Line 21 Data Channel, NTSC field, or HD caption Service. The table below identifies the commonly used NTSC (SD) Line 21 data channels.

Data Channel	Description
--------------	-------------

CC1	Primary language Closed Captioning in Field 1
CC2	Secondary language Closed Captioning in Field 1
CC3	Secondary language Closed Captioning in Field 2
XDS	Extended Data Services such as Program Rating, Type and Length. Appears in Field 2.

In HD captioning, Services are designated instead of Channels. Service 1 is assigned for primary language captioning, and Service 2 is assigned for secondary language captioning. When 608 data is up-converted to create 708 data, CC1 data is assigned to Service 1, and CC3 data is assigned to Service 2. Text and XDS data is preserved in 608 downcompatibility bytes, but is not up-converted.

The Local Entry Modes described in this section are used for local insertion of data into caption channels only; see the next section of the manual for XDS insertion mode.

### 3.4.2 Regeneration Mode

Upstream regeneration is used when no other local entry mode is enabled for a caption channel. The Encoder's default action is to regenerate the caption data recovered from the HD video input. If no upstream HD captioning is present, data from the SD input will be used instead.

The default Regeneration response is configurable by using the commands listed in this section, and also by setting the Block 608 Upconversion GPI switch.

#### **Regenerate Upstream VANC: <CTRL+A>! [ON/OFF] <ENTER>**

Instructs the Encoder to either detect and potentially regenerate (default) or ignore incoming VANC data from the HD video input. If the encoder is set to ignore upstream VANC data, output signals will include only caption data recovered and regenerated from the SD video input. Use OFF to ignore upstream VANC caption data, and ON to resume detecting upstream VANC caption data.

#### **Ignore Upstream L21 Channel: <CTRL+A>6 Channel <ENTER>**

**Return Upstream L21 Channel: <CTRL+A>7 Channel <ENTER>** Instructs the Encoder to ignore incoming Line 21 data from the SD video input in the specified caption channel. When Line 21 data in a channel is ignored, output signals will not contain any caption data recovered from the SD video input in that channel, even if there are no other data sources available.

**Channel** Channel sets the incoming Line 21 channel to be turned off. This parameter may be set for any NTSC Caption or Text channel. Upstream XDS data cannot be turned off with this command.

**Begin PassThru Mode:** <CTRL+A>3 [Field] <ENTER>

**End PassThru Mode:** <CTRL+C>

Displayed as PTHRU. When a port enters the command to begin PassThru for a field, caption data received through that port will replace upstream caption data for that field. PassThru mode is for use with complete CEA608 formatted data streams, including control and formatting codes, such as would be provided by captioning software packages. If PassThru is engaged but no valid data is being entered, pairs of null data bytes (0x80 0x80) will be inserted into output signals. When PassThru mode is ended, the field will return to upstream Regeneration.

**Field** Field specifies which NTSC field the locally entered caption data is intended for. Field 1 (enter as F1) is for primary language captioning and text, and Field 2 (F2) is for secondary language captioning and text. The parameter defaults to Field 1.

**Begin RealTime Mode:** <CTRL+A>2 [Channel] [Rollup] [bBase] <ENTER>

**End RealTime Mode:** <CTRL+C>

Displayed as RTCAP. When a port enters the command to begin RealTime mode, text entered through that port will be encoded into a rollup caption display and replace upstream caption data for the specified channel. The HD1492 Encoder will automatically create all necessary control and formatting codes. When RealTime mode is ended, the channel will return to upstream Regeneration.

Data entered in RealTime must be in ASCII text format with a carriage return (0x0D or <ENTER>) at the end of each line of data. Because a line of data is processed only upon receipt of a carriage return, text may be edited by use of a backspace (0x08 or <BACKSPACE>) at any time before the carriage return.

The input text may be formatted to fit on 32 character lines by sending a carriage return at word boundaries approaching the 32 character limit. If sufficient data to fill a line is not available within a reasonable amount of time, a carriage return should be sent to ensure timeliness for the queued data.

<b>Channel</b>	Channel specifies which NTSC caption channel the ASCII data that will be entered is intended for. Enter CC1 for primary language captioning or CC3 for secondary language captioning. If no parameter is entered, CC1 will be assumed.
<b>Rollup</b>	Rollup sets the number of rows in the rollup caption display that will be created. Possible values are 2, 3, and 4. If no setting is entered, 3 will be assumed.
<b>Base</b>	Base sets the row from which the caption display will begin rolling up. The parameter value must be entered with a leading 'b'. Possible values range from b2 (top of the screen) to b15 (bottom of the screen). The default value is b15. Always set the Base value at least as large as the number of rows in the rollup display, or else the uppermost row(s) of the display will not be visible.

### 3.5 XDS Insertion

Extended Data Services (XDS) is an NTSC Field 2 data channel that provides information to viewers about the program that is being aired. XDS is used to transmit FCC-mandated program ratings to allow viewer V-chip filtering. XDS is a part of the CEA-608 standard for SD broadcasts, and should be included in the 608 compatibility bytes of CEA-708 compliant HD broadcasts.

XDS data packets can be loaded into the Encoder's queue with one simple command, and be held for any specified time period. Each individual packet type can be independently set for upstream or local priority, and permanent packets can be stored in Non Volatile Memory and inserted automatically whenever the Encoder is operating.

Packets are inserted into output video signals using EEG's proprietary Stochastic Scheduling Algorithm. The Stochastic Scheduling Algorithm is a finely tuned solution to the Field 2 bandwidth limitations that cause difficulties in XDS packet transmission. A Priority level is automatically assigned to each packet based on its XDS Class and Type. The Stochastic Scheduling Algorithm ensures both that high priority packets like V-chip data and program names are transmitted frequently enough to be instantly accessible for new viewers, and that lower priority packets are guaranteed to be inserted periodically, and not preempted completely.

As per CEA-608B specifications, all available Field 2 space is filled, rescheduling and regeneration are automatically performed on all upstream packets, and packet continuations are applied when necessary. Additionally, upstream XDS program packets will

continue to transmit for five minutes after any non-clearing upstream interruption, such as a commercial break or undesired outage.

**Enable XDS Entry: <CTRL+A>O XDS O <ENTER>**

This command must be entered to enable a port for XDS input. A port must be enabled for XDS input in order to accept XDS data and control commands. The character repeated in the command is a capital o and not a zero.

**Set Active Port: <CTRL+A>O Px XDS O <ENTER>**

Used to request or yield Active status. The 'Px' argument specifies the port that XDS activity will be set to, i.e. P1. Port P3 can set the Active status of any port. The other ports can only request active status for itself and so does not need to enter the Px parameter. Active status can only be obtained if the port has been authorized in the Permission List.

Only one port can be active for each Data Type at a time. If another port is already active the E1 error message will be returned. If the command is entered with the override parameter O, the port entering the command will become active in place of the previous active port.

**Load XDS Packet: <CTRL+A>P Packet Duration Content [Priority] <ENTER>**

Creates an XDS packet and loads it into the XDS queue. The Encoder will begin inserting the packet immediately.

**Packet** Packet sets the XDS Class and Type of the packet that will be created. If a new packet is loaded with the same Packet ID as an existing packet in the queue, the pre-existing packet will be deleted; if the new packet is a Program Name or Program ID packet, all program-specific packets will be deleted from the queue. A packet loaded into the Encoder with the Load XDS Packet command has local priority; in output signals, it will replace all upstream packets of the same Class and Type. The Packet parameter should be entered as Class immediately followed by Type in the way shown in the table below. Leading zeroes may be omitted. The Class and Type of a few of the most commonly used XDS packets are shown in the following table; for a complete list refer to CEA-608B.

Class/Type	Content
0102	Current Program Length
0103	Current Program Name

0105	Current Program Rating
0501	Network Name
0502	Station ID (Call Letters)
0504	TSID

**Duration** Duration sets the transmission duration of the newly created packet. When a packet's duration period expires, it will be deleted from the XDS queue. A duration setting of -1 will cause the packet to be inserted until it is deleted by a future command. An integer setting (i.e. 100) will be interpreted as the number of times to output the packet before deleting it. An Elapsed Time setting (i.e. 00.45.00), will cause the packet to be inserted for that length of time, beginning when the command is entered, and then deleted.

**Content** Content sets the information content of the packet. Content can be entered in ASCII text enclosed in curly braces, or in ASCII Hex notation. If you enter data in ASCII hex mode, you must only use ASCII hex characters between 0x20 and 0x7f. A checksum need not be enclosed, as the Encoder will calculate it automatically before insertion.

**Priority** Priority is an optional parameter that allows the output priority of a packet to be customized. The parameter should not be used for standardized, commonly used packets, which the Encoder automatically assigns appropriate priorities. The parameter is useful for custom, user-defined packets. The default priority for packets that the encoder does not recognize is 115, which corresponds to a fairly low priority. A typical high priority value is 30. A packet's

numerical priority is inversely proportional to the frequency with which it is inserted.

Two sample XDS entries follow.

**<CTRL+A>P 103 -1 Evening News <ENTER>** will load and begin insertion for a current program name packet reading "Evening News." The packet will be output until a new packet is entered.

**<CTRL+A>P 105 00.30.00 4844 <ENTER>** will load and begin insertion for a current program rating packet of TV-PG. The packet will be inserted for the next thirty minutes. Refer to CEA-608B for a listing of hex codes for other possible program ratings.

**Load Default XDS Packet: <CTRL+A>P LPacket Duration Content [Holdoff] <ENTER>**

Loads an Upstream Priority XDS packet. This is called a "default" packet because it will be output only when no XDS packet of the specified Class and Type is present in the incoming video signal. When an upstream packet is discontinued without a replacement or a Clear packet (two Space characters), the Encoder will continue insertion of the discontinued packet for a time-out period of 5 minutes to ensure continuity during commercial breaks or replacement delays. The default packet will then be transmitted until the upstream packet is replaced.

The Packet, Duration, and Content parameters are the same as for the local priority Load XDS Packet command explained on the previous page, except the Packet Class/Type must be entered with a leading "L".

**Holdoff** Holdoff sets the number of seconds after which the default packet will begin transmission once the five minute upstream time-out period expires. The default is zero.

Example: **<CTRL+A>P L105 -1 4840 <ENTER>** will create a default program rating packet of None. This packet will be inserted beginning 5 minutes after an interruption in

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upstream program rating data, and will continue to be transmitted indefinitely until upstream data resumes.

**Report XDS Queue: <CTRL+A>e [Packet] <ENTER>**

Reports the contents and settings for the packet of the specified Class/Type loaded in the XDS queue. An asterisk after the packet ID indicates that max time-based preemptive priority has been set. If the Packet parameter is omitted, the entire XDS queue will be displayed. The following information is displayed:

**ID** is the packet's Class and Type. Default packets are displayed with a leading "L".

**Format** and **Ending** describe the packet's duration. A Format value of RE indicates an indefinite or integer duration, and a value of EL indicates an Elapsed Time duration. Ending displays the duration value.

**Priority** displays the packet's Priority rating. Packets with smaller numerical priorities go out more frequently than packets with larger numerical priorities, with an approximately inverse proportional relationship between numerical Priority and insertion frequency.

**Frames** displays the number of frames the packet occupies. Larger packets take up more frames and more bandwidth.

**Source** indicates whether the packet is locally inserted (Loc) or upstream regenerated (Up).

A report on an individual packet includes the packet's hex byte representation, decoded content for common packets, and checksum in addition to the above information.

**Delete XDS Packet: <CTRL+A>P Packet <ENTER>**

Deletes the packet of the specified Class and Type from the XDS queue. If the packet is a Program Name or Program ID packet, all other programspecific packets will also be deleted, and the Encoder will insert a Clear packet for downstream databases and decoders.

**Delete XDS Queue: <CTRL+A>L -all <ENTER>** Deletes all packets in the XDS queue.

**Block Upstream XDS: <CTRL+A>T -Class00 <ENTER> End Blocking: <CTRL+A>T Class00 <ENTER>**

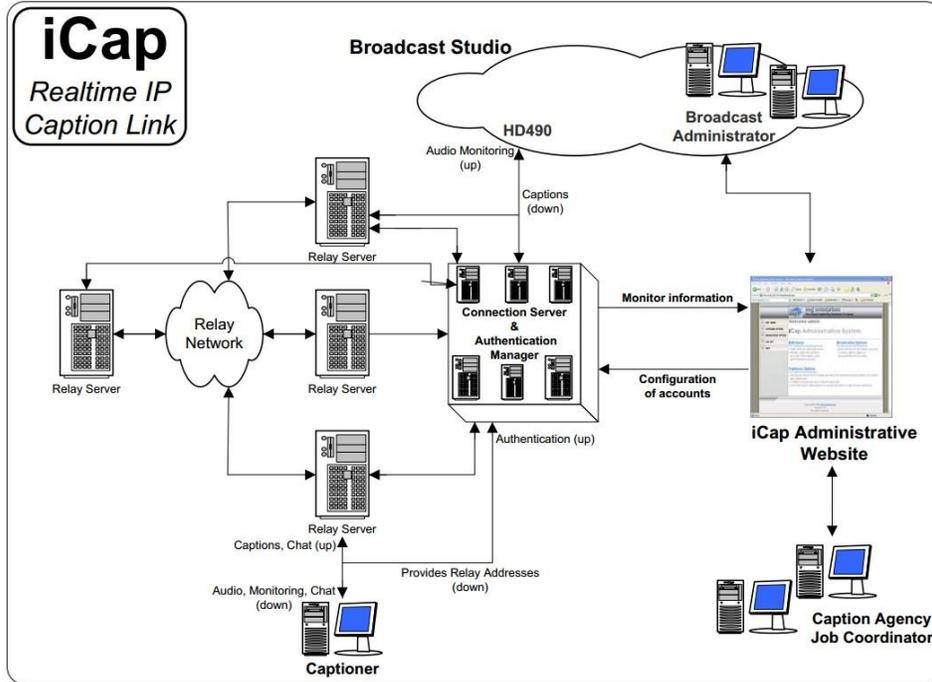
Blocks all incoming packets of the specified Class. Entering all instead of Class00 as the parameter will cause all upstream packets to be blocked.

Omitting the Class parameter will cause the block/pass status for each Class to be reported.

Example: **<CTRL+A>T -0100 <ENTER>** blocks all upstream XDS packets in the Current Program Class. **<CTRL+A>T 0100 <ENTER>** will resume normal XDS operation.

## 4 Additional Features

### 4.1 iCap™ Secure Internet Captioning



The EEG iCap™ system is a real-time IP-based captioning system designed exclusively for use with the EEG Smart Encoder platform. With iCap™, the HD1492 Encoder and a single LAN connection replace both an older encoder used with a dial-up modem line, and an external audio coupler with an additional phone line, while improving system security, quality of service, logging, and monitoring. iCap™ also greatly simplifies encoding jobs with multiple captioners and/or multiple encoders by creating dynamically networked, password-protected groups of Encoders and enabled captioners with real-time status reporting to participants and administrators.

The block diagram above shows the basic cloud architecture of the EEG iCap™ system. Each Encoder logs in to a secure remote connection server with its unique ID key and password automatically on startup. Once the Encoder is authenticated into the system, remote captioners can use the Encoder's access code to connect through a dedicated highspeed relay network. The captioners receive an encrypted audio stream and caption monitoring from the HD1492, and status messages from any other encoders or captioners in the group. All connections to each Encoder, and the start and stop times for any captioner sending data, are logged by the servers and accessible through a secure administrative website. iCap™ provides high quality, low latency audio to captioners for improved transcription

accuracy, and automatic status and arbitration messages eliminate common problems with loss of service due to dial-up modem preemption or lock-out.

Refer to the iCap™ manual in the 'Manuals' section on the HD1492 configuration page for complete details about getting started with iCap™.

## 4.2 Lexi™ Automatic Captioning



Lexi™ is the premier cloud-hosted automatic captioning service accessible through EEG closed caption encoders. No additional hardware is required to access Lexi; simply obtain a subscription, activate the service on your EEG encoder, and start captioning.

### **Superior Quality Caption Automation**

Lexi™ is capable of delivering over 90% accuracy in English and Spanish for many common media types - optimal for improving compliance and accessibility on currently uncovered material.

### **Expansive Cloud Learning Structure**

As a cloud service, Lexi™ instinctively learns new data for global news and entertainment. Lexi™ can also monitor user supplied URLs to absorb and leverage new data to match current on-air media transcriptions.

### **Breakthrough Topic Model Technology**

Lexi™'s "Topic Model" feature enables the system to recognize topics, immerse itself in distinctive vocabulary, and observe context through the absorption of relevant web data unique to each implementation. This ground-breaking advancement enables Lexi™ to perform in real-time with a degree of accuracy that reaches beyond previous speech-to-text systems.

### **Hybrid Workflows Supported**

For a hybrid approach, caption data from Lexi™ can be automatically interspersed with existing captions from a teleprompter system and/or human captioner to ensure coverage of only the unscripted segments, such as weather reports, to meet FCC full coverage mandates.

For more information about Lexi™, or to begin a free trial, please contact EEG Sales at [sales@eegent.com](mailto:sales@eegent.com).

### 4.3 Serial Port Configuration

**Change Baud Rate:** <CTRL+A>I P2 Baud Bits Parity <ENTER> Changes the baud rate on P2, the AUX RS-232 input port. A change in communication settings takes effect immediately; thus, after entering this command, you must immediately begin communicating at the new settings you entered.

- Baud** Sets the new baud rate for the port. Supported rates are 1200, 2400, 4800, and 9600.
- Bits** Sets the number of data bits. Choose either 7 or 8.
- Parity** Sets the parity bit. Choose either o for odd, e for even, or n for none.

### 4.4 Encoder Status Commands

**Report Identification:** <CTRL+A>? <ENTER>

Returns the Encoder's model, serial number, and firmware version.

**Recovery Status:** <CTRL+A>A <ENTER>

Returns the data recovery status of each Line 21 channel for incoming SD video. ON indicates that data on the channel is being recovered and processed. OFF indicates that the channel has been turned off and incoming data is being ignored.

**Monitor Line 21:** <CTRL+A>5 [Channel] [I/O] <ENTER>

**End Monitoring:** <CTRL+C>

Monitors and displays the EIA-608B caption data encoded in the specified channel. The I/O parameter determines whether the incoming (enter as I) or outgoing (O) data is monitored. The default settings are incoming and CC1.

### A General-Purpose I/O

Each of the 3 GPIO banks has the following pinout:

1	2
3	4
5	6
7	8

Bank A provides GPIs A-D:

Input	Pins
D	1, 2
C	3, 4
B	5, 6
A	7, 8

Bank B provides GPIs E-H:

Input	Pins
H	1, 2
G	3, 4
F	5, 6
E	7, 8

A GPI is activated when closed (grounded) and inactive when open (floating). The odd-numbered pin in a given pair is its ground. For example, GPI A can be activated by connecting pins 7 and 8 of Bank A, thereby grounding pin 8. If pin 8 were left floating, GPI A would be inactive.

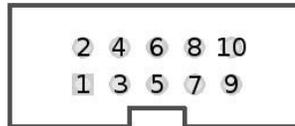
The GPO bank is arranged as follows:

Output	Pins
4	1, 2
3	3, 4
2	5, 6
1	7, 8

A GPO's pins form a switch that is on when closed and off when open. For example, pins 3 and 4 of the GPO bank form a switch that is closed when GPO 3 is active, and open when it is inactive.

### B Serial Port Connector

The single-width and double-width rear modules both contain a single IDC-10 connector, providing the interface for serial ports P1 and P2. P1 can be configured as RS-232, RS-422 (Sony), or RS-422 (EEG), via the DashBoard interface. P2 operates as RS-232 only. The following image and table describe the pin mapping from the IDC-10 connector to the two DB9 connectors that can be used to communicate with ports P1 and P2:



IDC	DB9, P1	DB9, P2
1	5	
2	8	
3	3	
4	2	

5	7	
6		5
7		8
8		3
9		2
10		7

In RS-232 mode, these ports can be connected directly to a standard PC serial port with a 9-pin, 3-wire straight serial cable. A 'null modem' cable MAY NOT be used for this purpose as it will reverse the connections of pins 2 and 3.

### C Video/Connector Specifications

SDI Video Inputs	
Number of Inputs	2
Connector	BNC per IEC 169-8
Format	2.97 Gb/s SMPTE 424M, 1.485 Gb/s SMPTE 292M, or SMPTE 259M 270 Mb/s
Input Level / Impedance	800 mV p-p ± 10% / 75 Ohm
Equalization	Automatic up to 100m @ 1.5Gb/s with Belden 1694 or equivalent
SDI Video Outputs	
Number of Outputs	2 relay bypass-protected
Connector	BNC per IEC 169-8
Output Level	800 mV p-p ± 10%
Output Impedance	75 Ohm
Format	2.97 Gb/s SMPTE 424M, 1.485 Gb/s SMPTE 292M, or SMPTE 259M 270 Mb/s (matches input format)
DC Offset	0V ± 0.5V
Rise/Fall Time	200pS nominal
Overshoot	< 10% of amplitude
Wide Band Jitter	< 0.2 UI
Data Input/Output Characteristics	

<p>Data Ports 2 DB-9 (one RS-232 and RS-422)                  Serial Data Format 7 data bits,                  GPIO Three 8-pin Molex containing 4 GPI inputs each,</p>	<p>232, one configurable between                  odd parity, 1 stop bit, 1200 baud default                  87831-0841 connectors: two                  GPI outputs <span style="float: right;">one containing 4</span></p>
<p><b>Electrical</b></p>	
<p>Power 115/230V AC 50/60Hz                  Power Consumption 6 W</p>	
<p><b>Physical</b></p>	
<p>Dimensions                  Weight</p>	<p>12.75" long x 3" wide x 1" tall                  &lt; 1 lb.</p>