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## INSTRUCTION MANUAL

# HDE-CSV-QAM

## *MPEG-2 HD Encoder*

| Model | Stock No. | Description |
|---|---|---|
| HDE-CSV-QAM | 6382A | MPEG-2 HD Encoder<br>1xComponent/HD-SDI/HDMI/VGA/Composite inputs;<br>1x QAM + 1xASI + 1xIP outputs |

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MADE IN USA

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We recommend that you write the following information in the spaces provided below.

| | |
|---|---|
| Purchase Location Name: | |
| Purchase Location Telephone Number: | |
| HDE-CSV-QAM Serial Number: | |

The information contained herein is subject to change without notice. Revisions may be issued to advise of such changes and/or additions.

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## Section 1 — General & Safety Instructions


The STOP sign symbol is intended to alert you to the presence of REQUIRED operating and maintenance (servicing) instructions that if not followed, may result in product failure or destruction.

The YIELD sign symbol is intended to alert you to the presence of RECOMMENDED operating and maintenance (servicing) instructions.

The LIGHTNING flash symbol is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.

**TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER FROM THIS UNIT.
NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE**

### NOTE TO CATV SYSTEM INSTALLER

**This reminder is provided to call the CATV System Installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.**

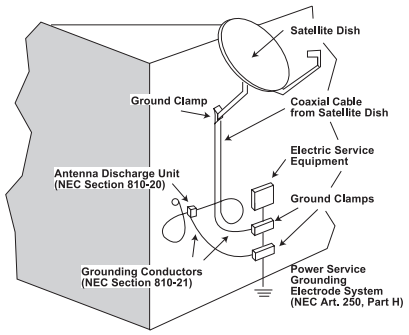
## Safety Instructions

**YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.**

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature per Section 2.3.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- Read all safety and operating instructions before you operate the unit.
- Retain all safety and operating instructions for future reference.
- Heed all warnings on the unit and in the safety and operating instructions.

## Safety Instructions - continued

- Follow all installation, operating, and use instructions.
- Unplug the unit from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the unit.
- Do not use accessories or attachments not recommended by Blonder Tongue, as they may cause hazards, and will void the warranty.
- Do not operate the unit in high-humidity areas, or expose it to water or moisture.
- Do not place the unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious personal injury and damage to the unit. Install the unit only in a mounting rack designed for 19" rack-mounted equipment.
- Do not block or cover slots and openings in the unit. These are provided for ventilation and protection from overheating. Never place the unit near or over a radiator or heat register. Do not place the unit in an enclosure such as a cabinet without proper ventilation. Do not mount equipment in the rack space directly above or below the unit.
- Operate the unit using only the type of power source indicated on the marking label. Unplug the unit power cord by gripping the plug, not the cord.
- The unit is equipped with a three-wire ground-type plug. This plug will fit only into a ground-type power outlet. If you are unable to insert the plug into the outlet, contact an electrician to replace the outlet. Do not defeat the safety purpose of the ground-type plug.
- Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.
- Be sure that the outdoor components of the antenna system are grounded in accordance with local, federal, and National Electrical Code (NEC) requirements. Pay special attention to NEC Sections 810 and 820. See the example shown in the following diagram:




- We strongly recommend using an outlet that contains surge suppression or ground fault protection. For added protection during a lightning storm, or when the unit is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the lines between the unit and the antenna. This will prevent damage caused by lightning or power line surges.
- Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing the antenna, take extreme care to avoid touching such power lines or circuits, as contact with them can be fatal.
- Do not overload wall outlets or extension cords, as this can result in a risk of fire or electrical shock.
- Never insert objects of any kind into the unit through openings, as the objects may touch dangerous voltage points or short out parts. This could cause fire or electrical shock.
- Do not attempt to service the unit yourself, as opening or removing covers may expose you to dangerous voltage and will void the warranty. Refer all servicing to authorized service personnel.
- Unplug the unit from the wall outlet and refer servicing to authorized service personnel whenever the following occurs:
  - ❑ The power supply cord or plug is damaged;
  - ❑ Liquid has been spilled, or objects have fallen into the unit;
  - ❑ The unit has been exposed to rain or water;
  - ❑ The unit has been dropped or the chassis has been damaged;
  - ❑ The unit exhibits a distinct change in performance.
- When replacement parts are required, ensure that the service technician uses replacement parts specified by Blonder Tongue. Unauthorized substitutions may damage the unit or cause electrical shock or fire, and will void the warranty.
- Upon completion of any service or repair to the unit, ask the service technician to perform safety checks to ensure that the unit is in proper operating condition.

### Returning Product for Repair (or Credit)

**A Return Material Authorization (RMA) Number is required on all products returned to Blonder Tongue, regardless if the product is being returned for repair or credit.** Before returning product, please contact the Blonder Tongue Service Department at 1-800-523-6049, Ext. 4256 or visit our website: **www.blondertongue.com** for further information.

# Section 2 — Product Summary

## 2.1 Revision History & Reason

This is the fifth issue of the Instruction Manual.

The reason for this revision was to reflect save and load configuration feature now available with firmware version 1.0.17 and above.

The reason for the fourth revision was to reflect web page updates in Section 5.3 now available with firmware version 1.0.13 and above.

The reason for the third revision was to reflect the updated web pages and features now available with hardware version 2 and above.

The reason for the second revision was to reflect the web page changes.

## 2.2 Product Application & Description

**Application:**

HDE-CSV-QAM (MPEG-2 HD Encoder – 1xComponent/HD-SDI/HDMI/VGA/Composite – 1xQAM) accepts one (1) high-definition (HD) program from any of the following inputs: 1xComponent, 1xHD-SDI, 1xHDMI (unencrypted), 1xVGA, and 1xComposite. MPEG-2 encoded outputs are available in the following formats simultaneously: 1xQAM, 1xASI, and 1xIP (10/100Base-T Ethernet). The QAM RF output is frequency agile over the entire CATV frequency range of 54-1002 MHz (channels 2-158) with an output level of +40 dBmV.

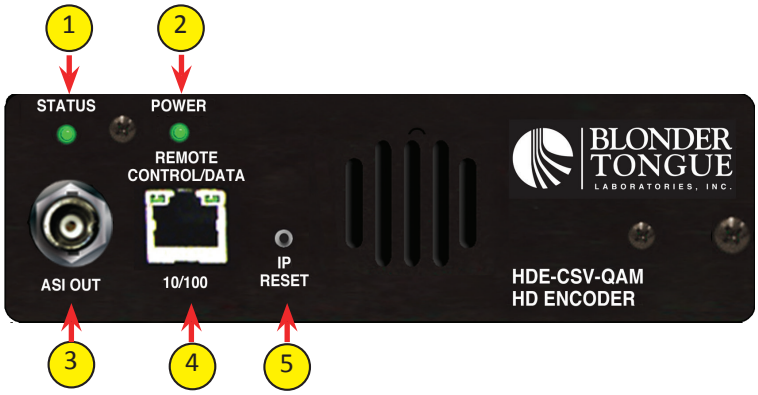
The encoder supports Dolby® Digital audio encoding, and Closed Captioning (EIA-608 and EIA-708). Comprehensive remote monitoring and control is accomplished using any standard Web browser via a front-panel 10/100Base-T Ethernet connection. A rear-panel VGA output port is available for loop-through applications.

**Features:**

- Accepts one (1) program from any of the following inputs: 1xComponent, 1xHD-SDI, 1xHDMI (unencrypted), 1xVGA, and 1xComposite
- Simultaneously delivers the following outputs: 1xQAM, 1xASI, and 1xIP
- Provides +40 dBmV QAM RF output level
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Compact design permits installation of up to 3 Encoder modules in 1RU
- Supports Real-time Dolby® Digital audio encoding
- Supports user-defined PSIP configuration
- Supports Closed Captioning EIA-608 and EIA-708

**Description:**

Front Panel connectors and indicators :




1 **STATUS LED:**

LED indicates the status of input video and audio as follows:

LED is Green = both video and audio inputs are present.

LED is Green Blinking On/Off = video input type detected is HDMI or HD-SDI and/or audio input type detected is Digital Audio (PCM)

LED is Red = video and/or audio inputs has errors.

LED is OFF = both video and audio inputs are not present.

2 **POWER:**

LED is Green = AC power is detected.

LED is Off = indicates (i) AC power is not connected, or (ii) AC power is connected but the power supply is defective. The unit must be sent to Blonder Tongue for repair for condition (ii).

3 **ASI OUT:**

The "ASI OUT" BNC connector to deliver the encoded output and is typically used as input to an external modulator.

4 **REMOTE CONTROL/DATA 10/100:**

RJ45 connector for 10/100Base-T Ethernet interface for monitoring and configuring the unit. The same interface is used to deliver the IP output. Only static IP address can be assigned to this interface. The factory default value is 172.16.70.1.

5 **IP RESET:**

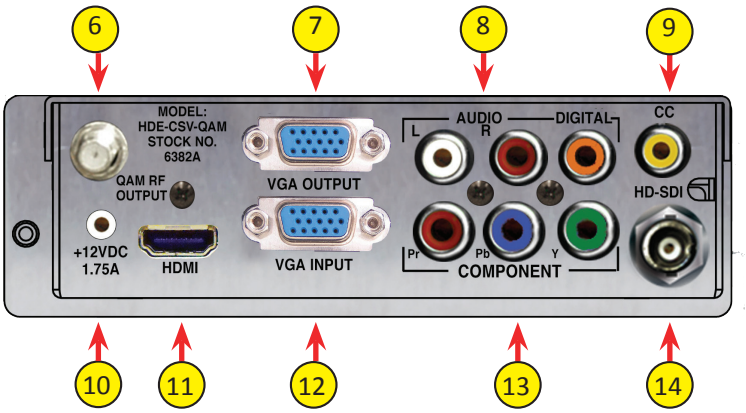
When pushed and held for about 10 seconds, resets the IP address, Usernames, and Passwords to Factory default values as follows:

IP address = **172.16.70.1**

Username = **Admin** (case-sensitive)

Password = **pass** (case-sensitive)

Rear panel connectors:




6 **QAM RF OUTPUT:**
"F" connector for QAM output.

7 **VGA OUTPUT:**
DE-15 female connector for loop-through VGA output.

8 **AUDIO:**
RCA connectors (marked L and R) for Analog Left/Right Audio input and RCA connector (marked "DIGITAL") for Digital Audio program input.

9 **CC:**
RCA connector (marked "CC") for Analog NTSC Closed Captioning (EIA-608, also known as Line 21), which will then be digitized and inserted in the MPEG-2 Transport Stream of the Component, HDMI, and VGA inputs.

10 **INPUT POWER:**
ITE power supply - rated 115-230VAC / Output 12VDC @ 3 Amp.

11 **HDMI:**
HDMI connector for unencrypted HDMI input.

**THE UNIT DOES NOT ACCEPT HDCP-ENCRYPTED HDMI INPUT.**

12 **VGA INPUT:**
DE-15 female connector for VGA input.

13 **COMPONENT:**
RCA connectors (marked Pr, Pb, Y) for Analog Component Video input. The RCA connector (marked Y) is also used for Composite Video input.

14 **HD-SDI**:
BNC connector to recieve the HD-SDI input.

## 2.3 Product Specification

### Input

| | |
|---|---|
| **Component** | |
| **Connectors:** | 3x RCA for Video (Y, Pb, Pr) |
| **Video Resolution:** | 480i, 720p, & 1080i |
| **Video Aspect Ratio:** | 4:3 & 16:9 |
| **Audio:** | 2x RCA for Analog Audio (L, R)<br>1x RCA for Digital Audio (PCM) |
| **HD-SDI** | |
| **Connector:** | 1x BNC |
| **Standard:** | SMPTE 292M |
| **Video Resolution:** | 480i, 720p, & 1080i |
| **Audio:** | Embedded PCM and pass-through Dolby® Digital only |
| **HDMI** | |
| **Connector:** | 1x HDMI |
| **Video Resolution:** | 480i, 720p, & 1080i |
| **HDCP Encryption:** | Not supported |
| **Audio:** | Embedded PCM & pass-through Dolby® Digital only |
| **VGA** | |
| **Connectors:** | 2x Female VGA (Input + Loop-through Output) |
| **Video Resolution:** | 640x480 @ 60 fps<br>800x600 @ 60 fps<br>1024x768 @ 60 fps |
| **Audio:** | 2x RCA for Analog Audio (L, R)<br>1x RCA for Digital Audio (PCM) |
| **Composite** | |
| **Connectors:** | 1x RCA for Video (Y) |
| **Video Resolution:** | 480i |
| **Audio:** | 2x RCA for Analog Audio (L, R)<br>1x RCA for Digital Audio (PCM) |

| | |
|---|---|
| **Encoding Profile** | |
| **Video** | |
| **Output Format:** | MPEG-2 HD MP@ML; ISO 13818-2 |
| **Chroma:** | 4:2:0 |
| **Resolution:** | 480i, 720p, 1080i |
| **Frame rate:** | 29.97 fps (480i); 29.97 fps (1080i); 59.97 fps (720p) |
| **Aspect Ratio:** | 4:3 & 16:9 |
| **GOP Structure:** | I & P frames (user-selectable) |
| **Transport Rate:** | Variable (user-selectable) |
| **Video Bit Rate:** | Variable (user-selectable) |
| **Video Pre-filter:** | Variable (user-selectable) |
| **Intra DC Precision:** | Variable; 8-11 bit (user-selectable) |
| **Color Space:** | YCbCr and RGB |
| **Audio** | |
| **Output Format:** | Dolby® Digital AC-3 |
| **Sampling rate:** | 48 kHz |
| **Bit rate:** | Variable; 96 - 448 Kbps (user-selectable) |
| **Closed Captioning** | |
| **Component:** | EIA- 608; 1x RCA (CC) |
| **HD-SDI:** | EIA-708; Embedded in HD-SDI input |
| **HDMI:** | EIA- 608; 1x RCA (CC) |
| **Composite:** | EIA- 608 |
| **VGA:** | EIA- 608; 1x RCA (CC) |

### Output

| | |
|---|---|
| **QAM** | |
| **Connector:** | 1x "F" Female (Rear-panel) |
| **Modulation:** | QAM 16, 32, 64, 128, and 256 |
| **Standards:** | ITU-T J.83; Annex A and B |
| **DVB Symbol Rate:** | Variable; up to 7 MSymbol/sec (MBaud) |
| **Frequency Range:** | 54 to 1002 MHz |
| **Tuning:** | CATV Channel Selectable (Ch. 2 to 158) |
| **Channels' Bandwidth:** | 6 MHz |
| **RF Level:** | +40 dBmV ±1 dB |
| **RF Level Adjustment:** | +32 to +42 dBmV, 1 dB increment |
| **Frequency Tolerance:** | ± 0.5 kHz @ 77 °F (25 °C) |
| **Frequency Stability:** | ± 5 kHz over 32 to 122 °F (0 to 50 °C) |
| **Amplitude Flatness:** | ± 0.25 dB (over 6 MHz channel) |
| **Phase Noise:** | -98 dBc (@ 10 kHz) |
| **Spurious:** | -60 dBc |
| **Broadband Noise:** | -70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth) |
| **Impedance:** | 75 Ω |
| **Spectral Inversion:** | Auto Recognition |
| **Carrier Suppression:** | 45 dB |
| **Return Loss:** | 14 dB typical |
| **Signal-to-Noise Ratio (SNR):** | 40 dB typical |
| **MER:** | 40 dB typical |
| **I/Q Phase Error:** | Less than 1 degree |
| **I/Q Amplitude Imbalance:** | Less than 1% |
| **ASI** | |
| **Connectors:** | 1x BNC (Front-panel) |
| **Format:** | DVB-ASI |
| **Standard:** | ETSI EN 50083-9 |
| **IP** | |
| **Connector:** | 1x RJ45 (Front-panel) |
| **Standard:** | 10/100Base-T Ethernet |
| **UDP/RTP:** | Supported (user-selectable) |

### General

| | |
|---|---|
| **Dimensions (W x D x H):** | 5.65 x 12.5 x 1.75 inches (144 x 317.5 x 44.5 mm) |
| **Power:** | External Power Supply (Input 115-230VAC / Output 12VDC @ 3 Amp) |
| **Power Dissipation:** | 20 W |
| **Weight (one module):** | 1.5 lbs (0.7 kg) |
| **Operating Temperature:** | 32 to 122 °F (0 to 50 °C) |
| **Storage Temperature:** | -13 to 158 °F (-25 to 70 °C) |
| **Operating Humidity:** | 0 to 95% RH @ 35 °C max, non-condensing |
| **Storage Humidity:** | 0 to 95% RH @ 35 °C max, non-condensing |

### Alarms/Monitoring/Control

| | |
|---|---|
| **Local Monitoring:**<br>**Local Control:** | 1x Status LED<br>1x Power LED<br>1x IP Reset button |
| **Remote Monitoring/Control:** | GUI-based menu via standard Web browsers<br>(1x RJ45 front-panel connector; 10/100Base-T, also used for IP output) |

# Section 3 – Installation & Power-up

## 3.1 Unpacking

You will find the following items in the box:

- HDE-CSV-QAM Encoder (QTY=1)
- Switching Mode Power Supply, 12 VDC, 3.0A
- A hardware bag (item 741021800) containing the following:

  Seven-foot cross-pinned (cross-over) RJ45 Ethernet cable (QTY=1)

## 3.2 Installation

The HDE-CSV-QAM encoder is designed to be installed in the HDE-3MCH Series rack chassis. The chassis can support 3 HDE-CSV-QAM modules, each utilizing 2 standard single slots.

You can mount the chassis in a standard EIA, 24 inch (610 mm) deep, enclosed rack. Secure the rack chassis front panel to the rack by inserting four machine screws, with cup washers, through the four mounting holes in the front panel.

When installing one or more chassis in a headend rack, it is recommended to leave a 1 rack unit space (1.75” high) between units to maximize air flow, but it is not required.

**FOR SAFE AND RELIABLE OPERATION, THE GROUND PIN OF THE POWER CORD PLUG MUST BE GROUNDED PROPERLY.**

## 3.3 Power-up

To power up the unit, connect the line cord to a 115/230 VAC outlet.

The “POWER” LED on the front-panel will light green.

## Section 4 – Communicating with the Unit

Local or remote communication with the unit is only possible through a GUI-based menu via any standard web browser. Before you can communicate with the unit, you must configure the unit's IP address to conform with your existing IP network or LAN. To do so, follow these steps:

1) Plug one end of the Ethernet cross cable that is provided in the hardware bag to unit's front-panel RJ45 interface marked **"Remote Control/Data 10/100"**. Plug the other end of the cable to your computer.

2) The factory default IP address of the unit is **172.16.70.1**. To be able to communicate with the unit, you must first change your computer's IP address.

The following steps explain how to do this for a computer with **Windows XP** operating software:

(a) On your computer, open the "Control Panel"

(b) Double-click on "Network Connections"

(c) Right-click on the "Local Area Connection", and then click on the "properties".

(d) A dialog box entitled "Local Area Connection Properties" will appear. In this box, double-click on the "Internet Protocol (TCP/IP)".

(e) A dialog box entitled "Internet Protocol (TCP/IP) Properties" will appear. Select the "Use the following IP address" option and enter the following addresses:

IP address: **172.16.70.2**
Subnet mask: **255.255.255.0**
No need to enter a value for the Default Gateway.

Click OK to close the dialog box. Now your computer is ready to communicate with the unit.

**- OR -**

The following steps explain how to do this for a computer with **Windows 7** operating software:

(a) On your computer, open the "Control Panel"

(b) Click on "Network and Internet"

(c) Click on the "View network status and tasks"

(d) Click on "Change Adapter Settings" on left hand side of the window

(e) Right-click on the "Local Area Connection", and then click on the "properties".

(f) A dialog box entitled "Local Area Connection Properties" will appear. In this box, double-click on the "Internet Protocol Version 4 (TCP/IPv4)".

(g) A dialog box entitled "Internet Protocol Version 4 (TCP/IPv4) Properties" will appear. Select the "Use the following IP address" option and enter the following addresses:

IP address: **172.16.70.2**
Subnet mask: **255.255.255.0**
No need to enter a value for the Default Gateway.

Click OK to close the dialog box. Now your computer is ready to communicate with the unit.

# Section 5 - Configuring the Unit

## 5.1 Accessing the Unit Via the Web Browser

You must complete the steps described in Section 4 before proceeding as follows:

1) Open a web browser on your computer (Internet Explorer 7 or higher is recommended) and enter the following URL address (http://172.16.70.1). The "Login" Screen (Figure 5.1) will appear.

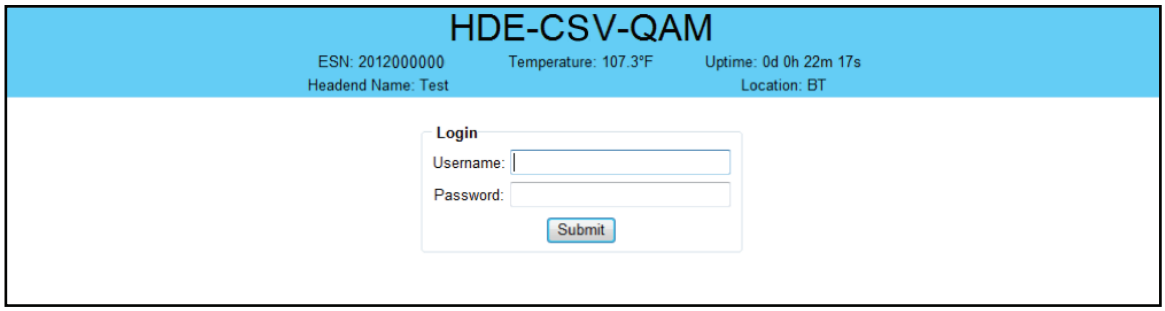



**Figure 5.1 - "Login" Screen**

2) Enter the following case-sensitive factory-default Username and Password, and click on the "Submit" button.

> **NOTE:** When logged in as Admin, the user has read and write permission. Only one Admin can be logged in at a time. When logged in as Guest, the user has only read permission. Up to four Guests can be logged in simultaneously.

Username = **Admin** (case-sensitive)
Password = **pass** (case-sensitive)

**- OR -**

Username = **Guest** (case-sensitive)
Password = **pass** (case-sensitive)

Monitoring and configuration of the unit is achieved via a series of web pages as described in the Sections below. The following read-only information is displayed in a “page header” – in blue color – on top of each web page:

**ESN:** unit’s Serial number

**Headend name:** a user-defined field to make identification easier

**Temperature:** temperature of unit’s chipset

**Uptime:** time elapsed since last time the unit was turned on

**Location:** a user-defined field to make identification easier

As shown in Figure 5.2, under the blue “page header” the following Primary tabs will appear:

- Primary tab “Main” includes the following sub-tabs: Status, Video, Audio, TS Config, IP, QAM, Output, and Refresh.
- Primary tab “Network” doesn’t include any sub-tab.
- Primary tab “Time” doesn’t include any sub-tab.
- Primary tab “Event Log” doesn’t include any sub-tab.
- Primary tab “Logout” doesn’t include any sub-tab.

Each Primary and sub-tab is described in the subsequent Sections.

## 5.2 "Main > Status" Screen

The “Main > Status” screen (Figure 5.2) is a “read only” screen and displays the following information:

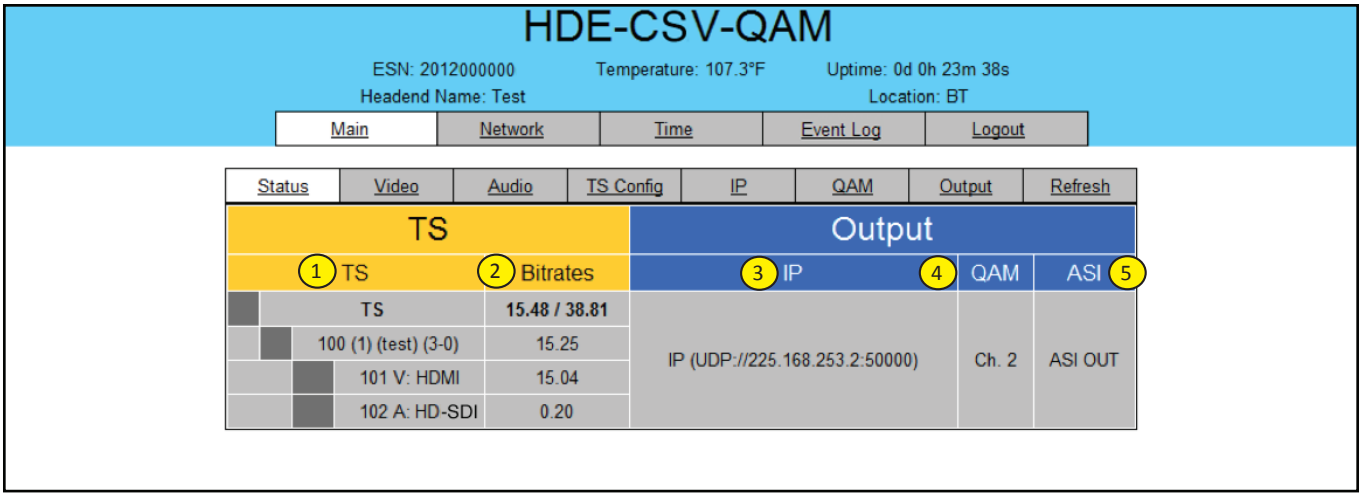



**Figure 5.2 - "Main > Status" Screen**

In the section entitled **"TS"** under an orange header, the following parameters about the output are displayed:

1 **TS**: indicates the selected program's information. The program information includes the PMT PID, Program number, Short Name, Major-minor channel number, Video elementary stream PID, Video input source, Audio elementary stream PID, and Audio input source.

2 **Bitrates:** indicates the transport stream bitrate (see 2 of Section 5.3 for details) and the TS Bitrate (see 2 of Section 5.5 for details).

In the section entitled **"Output"** under blue header, the following parameters about the output are displayed:

3 **IP:** indicates the encapsulation method, IP address, and the port number to which an output is assigned.

4 **QAM:** indicates the RF channel number of the QAM output.

5 **ASI**: indicates that ASI output is assigned.

## 5.3. "Main > Video" Screen

The "Main > Video" screen (Figure 5.3) is a "user-configurable" screen to select the video encoder parameters for the input program:

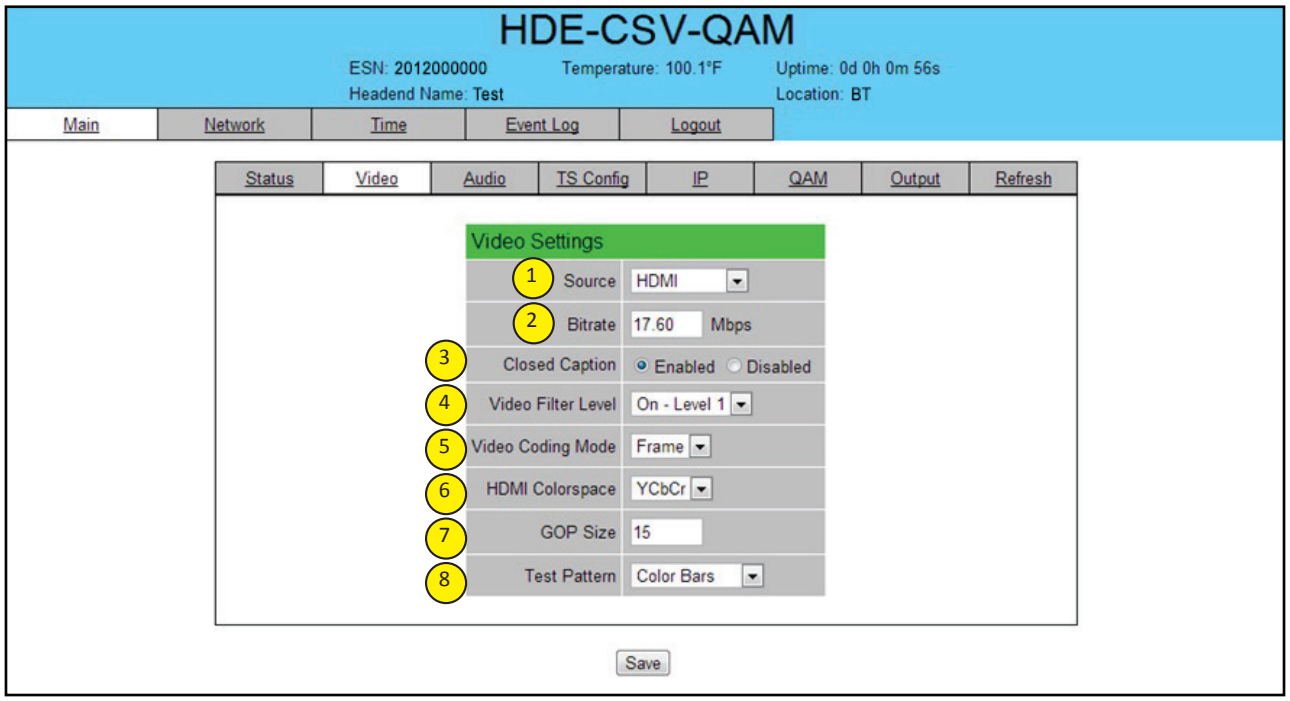



**Figure 5.3 - "Main > Video" Screen**

1 **Source:** allows the user to select the type of the video input source. Possible options are: Composite, Component, HD-SDI, VGA, and HDMI.

2 **Bitrate:** must enter the bitrate for the input video. It is recommended to ensure that the bitrate of the input video does not exceed **"TS Bitrate"** selected on the **"Main > TS Config"** Screen (see 2 of section 5.5 for details).

3 **Closed Caption:** is the process of passing the EIA-608 and EIA-708 Closed Captioning (CC) information and displaying the CC text on television or other visual display. Possible options are Enabled and Disabled. The factory default value is "Disabled".

4 **Video Filter Level:** is a two-dimensional low-pass filter controlling the degree with which the input video is filtered. Possible options are: Off (no filtering), On-Level 1, On-Level 2, On-Level 3, and On-Level 4 (highest filtering coefficient). Level 1 filtering of the video will smoothen the sharp edges of the pixels and produce a softer image. The softer an image, the less number of bits required to encode the image at the quantizer level.

5 **Video Coding Mode:** must select the Video Coding Mode. Possible options are: Frame and Field. The factory default value is Frame.

6 **HDMI Colorspace:** allows the user to select the color space of HDMI input source. Possible options are: RGB and YCbCr. The factory default is "RGB".

**NOTE:** If the displayed pictures are very green or violet in color, it is a good indication that this setting is incorrect.

**Option 6 will be available only if "HDMI" is selected in 1 above.**

7 **GOP Size:** The length between I-frames is known as the group of pictures (GOP) size. The factory default value is 15 i.e. 1 I-frame for every 14 non-I-frames. The range is 1 to 120.

8 **Test Pattern:** is the video pattern that will be displayed on the output screen if no input video is detected. Possible options are: Color Bars, Black Screen, Blue Screen, and Red Screen.

**Remember to click on the SAVE button to apply the new values/configurations.**

## 5.4 ”Main > Audio” Screen

The “Main > Audio” screen (Figure 5.4) is a “user-configurable” screen where the following parameters associated with the Dolby® Digital encoded stereo audio are configured and displayed for the audio input under a green header:

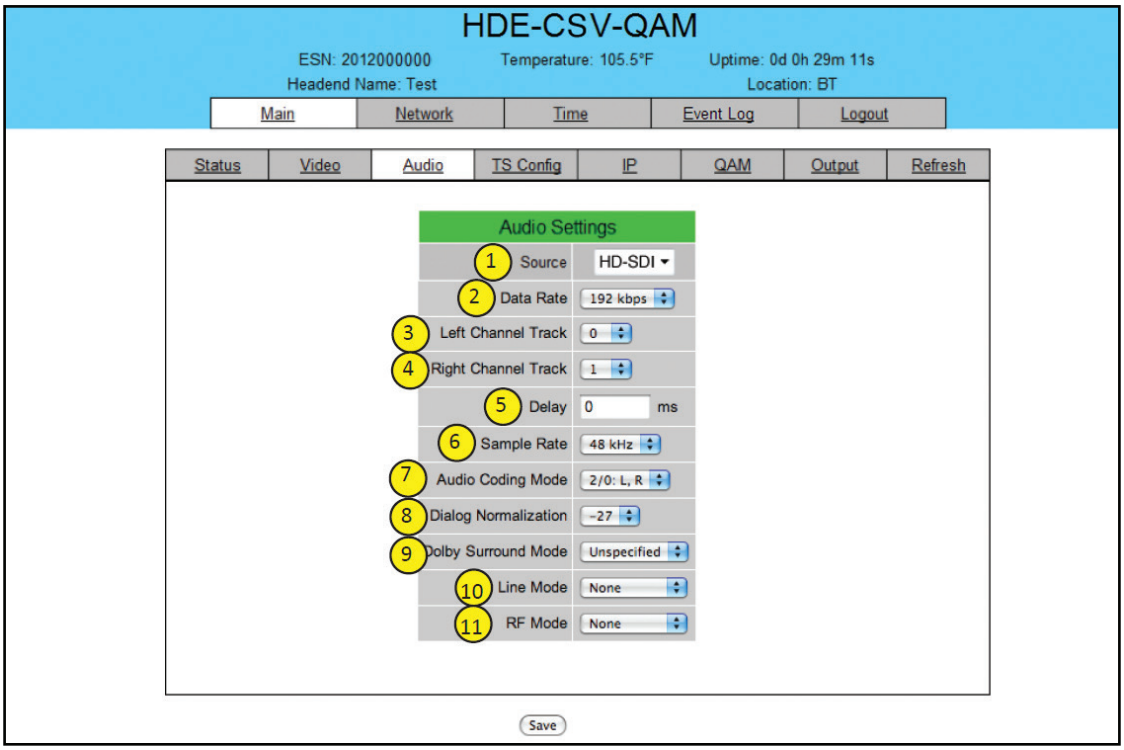



**Figure 5.4 - “Main > Audio” Screen**

1 **Source:** allows the user to select the type of the audio input source. Possible options are: Analog, Digital, HDMI, and HD-SDI.

2 **Data Rate:** allows the user to select the audio encoding bitrate in kbps (kilobits per second). The range is 96 to 448 kbps. The factory default value is 192 kbps that supports Audio Coding Mode 2/0:L, R.

**NOTE:** See Dolby Encoding guidelines for additional information.

3 **Left Channel Track:** allows the user to select the location in the HD-SDI stream where the audio track resides. The default location is “0” which is typically used for the left stereo channel. The range setting is 0 to 15.

4 **Right Channel Track:** allows the user to select the location in the HD-SDI stream that the audio track resides. he default location is “1” which is typically used for the right stereo channel. The range setting is 0 to 15.

**Options 3 & 4 will be available only if HD-SDI is selected in 1 above.**

5 **Delay:** allows the user to adjust the audio delay (-300 to 300 ms) to correct for input video/audio sync mismatch.

6 **Sample Rate:** indicates the input sampling rate of the encoder. The HDE-CSV-QAM supports 48 kHz sampling rate.

7 **Audio Coding Mode:** also referred to as Channel mode. Indicates the number of main audio channels within the encoded bitstream and also indicates the channel format. The unit supports 2/0:L,R= audio is a dual channel (Left & Right).

8 **Dialog Normalization:** behaves as an Audio Automatic gain Control (AgC) or Dynamic Range Control (DRC). It has the ability to take different incoming audio levels and normalize them. The ability of the Dialog Normalization depends on the configuration of the Dynamic Range Control. The HDE-CSV-QAM allows you to adjust the normalization from -1 to -31 dB. The typical value is -27 dB. This is based on the standard film audio formats which normally are between -25 and -31 dB.

9 **Dolby Surround Mode:** indicates if the audio is two-channel Dolby or not. Possible options are:

Unspecified: indicates the decoder must determine the audio format by itself.
Disabled: indicates the audio is not encoded in surround mode.
Enabled: indicates the audio is encoded in surround mode.

10 **Line Mode:** allows the user to select the type of Dynamic Range Compression to be applied to signals that will be used as direct audio feeds into a TV tuner or other receive devices. The factory default value is “None”.

11 **RF Mode:** allows the user to select the type of Dynamic Range Compression to be applied to signals that will be used for retransmission on an RF carrier, and then fed into TV tuner or other receive devices at the end of the line. The factory default value is “None”.

Possible options for 10 and 11 are:

i) **None:** no dynamic range controls have been assigned.

ii) **Film Standard:** suitable for movies where the very low-level sounds are not to be amplified due to other undesirable background noises that may become audible, but rather the peaks and valleys are normalized instead. It has a null bandwidth of 10 dB (-31 to -21 dB) and can add up to 6 dB of boost for low levels and attenuate high levels. The setting is used to quiet load shouting and amplifier whispers. See Dolby Encoding guidelines for additional information.

iii) **Film Light:** is similar to “Film Standard” but with a null bandwidth of 20 dB (-41 to -21 dB) and can add up to 6 dB of boost for low levels and attenuate high levels.

iv) **Music Standard:** suitable for program content that is mainly made up of music where the sound level is to be normalized (reducing the loudness) to be consistent with other programs. It has a null bandwidth of 10 dB (-31 to-21 dB) and can add up to 12 dB of boost for low levels and attenuate high levels. See Dolby Encoding guidelines for additional information.

v) **Music Light:** similar to “Music Standard” but with a null bandwidth of 20 dB (-41 to -21 dB) and can add up to 12 dB of boost for low levels and attenuate high levels.

vi) **Speech:** suitable for program content that is mainly made up of speech only and has a null band width of 10 dB (-31 to -21 dB) for average speech and can add up to 15 dB of boost for low levels and attenuate high levels. The setting is used to quiet load shouting and amplifier whispers. See Dolby Encoding guidelines for additional information.

**Remember to click on the SAVE button to apply the new values/configurations.**

## 5.5 ”Main > TS Config” Screen

The “Main > TS Config” screen (Figure 5.5) is a “read and write” screen to assign the TS parameters:

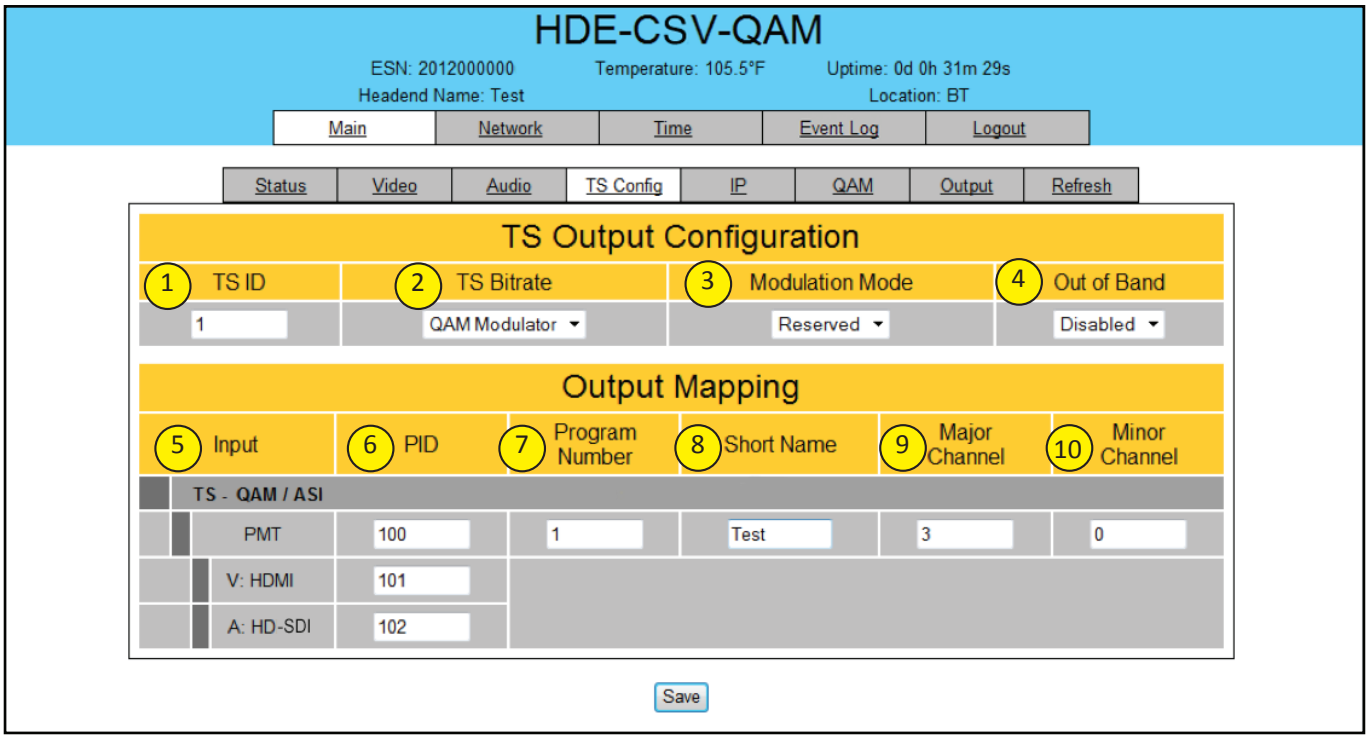



**Figure 5.5 - "Main > TS Config" Screen**

In the section entitled **“TS Output Configuration”**, the user can select and configure the following parameters of the output TS:

1 **TS ID:** must enter the identification number for the Transport Stream (TS) output. The range is 1 to 65535.

2 **TS Bitrate:** must select the bitrate for the output TS. Possible options are QAM Modulator, 19.39 Mbps, and 38.81 Mbps.

**Always select the option "QAM Modulator", if QAM output is required. The TS Bitrate assigned will then depend on the "Output QAM Mode" selected on the "Main > QAM" Screen (see 5 of Section 5.7 for details) and will be as follows:**

| QAM Output Mode | TS Bitrate assigned (Mbps) |
|---|---|
| 64B | 26.97 |
| 256B | 38.81 |
| 16A | 18.64 |
| 32A | 23.30 |
| 64A | 27.96 |
| 128A | 32.62 |
| 256A | 37.28 |

3 **Modulation Mode:** select the modulation mode. Possible options are: Reserved, Analog, QAM64, QAM256, 8-VSB, and 16-VSB.

4 **Out of Band:** An out-of-band (OOB) is a channel which is the combination of the forward and reverse OOB channels. When a cable virtual channel is flagged as being out-of-band, it is carried on the out-of-band channel. Possible options are Enable and Disable. When Enabled, assigns the OOB bit in the TS packet and labels the TS as out-of-band.

> **NOTE:** As per the ATSC and Cable standards, the Modulation Mode and Out-of-Band fields are required to be assigned in the TS packet. Selecting the above two fields would allow the TS packets to be compliant with industry standards, but would not affect the input or output configuration of the HDE-CSV-QAM.

In the section entitled **"Output Mapping"**, the user can select and configure the following parameters for the output TS indicated by **"TS - QAM/ASI"** under gray header:

5 **Input:** indicates the program selected by the user. It includes the Input video source, and audio source.

6 **PID:** must enter the PID value for each stream. PID (Packet Identifier) values are embedded by the content provider in the MPEG-2 stream to identify tables and programming packets.

**The PID value must be unique in an output stream. If a duplicate PID exists, assign a different PID in the range of 48 to 8176 (recommended range provided by the International Standards)**

7 **Program Number:** must enter an output program number. PMT (Program Map Table) provides information of program present in the transport stream such as program_number, and the list of the elementary streams (audio, video or data). The range is 1 to 65535.

8 **Short Name:** must enter the short name of the channel. Up to 7 alphanumeric characters are allowed.

9 **Major Channel:** must enter the major channel number for the output program. The range is 1 to 99 for Terrestrial and 1 to 999 for Cable.

10 **Minor Channel:** must enter the minor channel number for the output program. The range is 0 to 99 Terrestrial and 0 to 999 for Cable.

**The channel number displayed on the screen is the combination of the major and minor channels. For example, if major channel - 6 and minor channel = 1, then the channel number displayed on the TV would be 6-1.**

**Remember to click on the SAVE button to apply the new values/configurations.**

## 5.6 "Main > IP" Screen

The “Main > IP” screen (Figure 5.6) is a “read and write” screen to assign IP parameters for the TS:

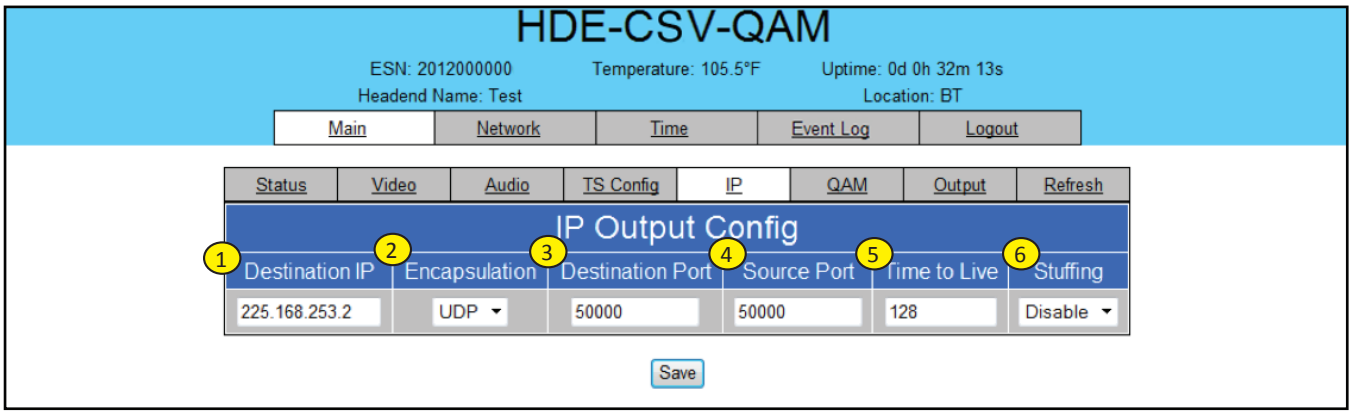



**Figure 5.6 - "Main > IP" Screen**

1 **Destination IP:** allows user to assign the IP address of the equipment to which the IP output is streamed to.

> **The Destination IP Address must be present before streaming occurs, otherwise the session is aborted. For Multicast applications, the IP address must be in the range of 224.0.0.0 through 239.255.255.255. For Unicast applications, the IP address must be outside the above-mentioned range**

2 **Encapsulation:** from the two available options (RTP & UDP) must select the one that matches the protocol used by the receiving equipment.

3 **Destination Port**: must enter the IP Port of the receiving equipment. The factory default value is 50000. The range is 1 to 65535.

4 **Source Port:** must enter the IP Port of the equipment that the input IP source is streamed from. The factory default value is 50000. The range is 1 to 65535.

> **NOTE:** Port number is recommended to be from 49152 to 65535. Reason: Port 1-1023 and 1024-49151 are the Reserved Ports and the Registered Ports, respectively.

5 **Time to Live:** is an upper bound on the time that an IP packet can exist in an IP network. The value is set by the sender of the packet, and reduced by every host on the route to packet’s final destination. If the Time to Live reaches zero before the packet arrives at its final destination, then the packet is discarded. The purpose of this field is to avoid an undeliverable packet from circulating on an IP network perpetually. The range is 1 to 255. Factory default value is 128.

6 **Stuffing:** Null packets are inserted to ensure that the TS bitrate assigned in 2 of Section 5.5 remains constant. Possible options are Enable and Disable. It is advisable to Disable stuffing when only IP output is used to help reduce the traffic on the network.

## 5.7 ”Main > QAM" Screen

The “Main > QAM” screen (Figure 5.7) is a “read and write” screen to assign QAM parameters to the TS:

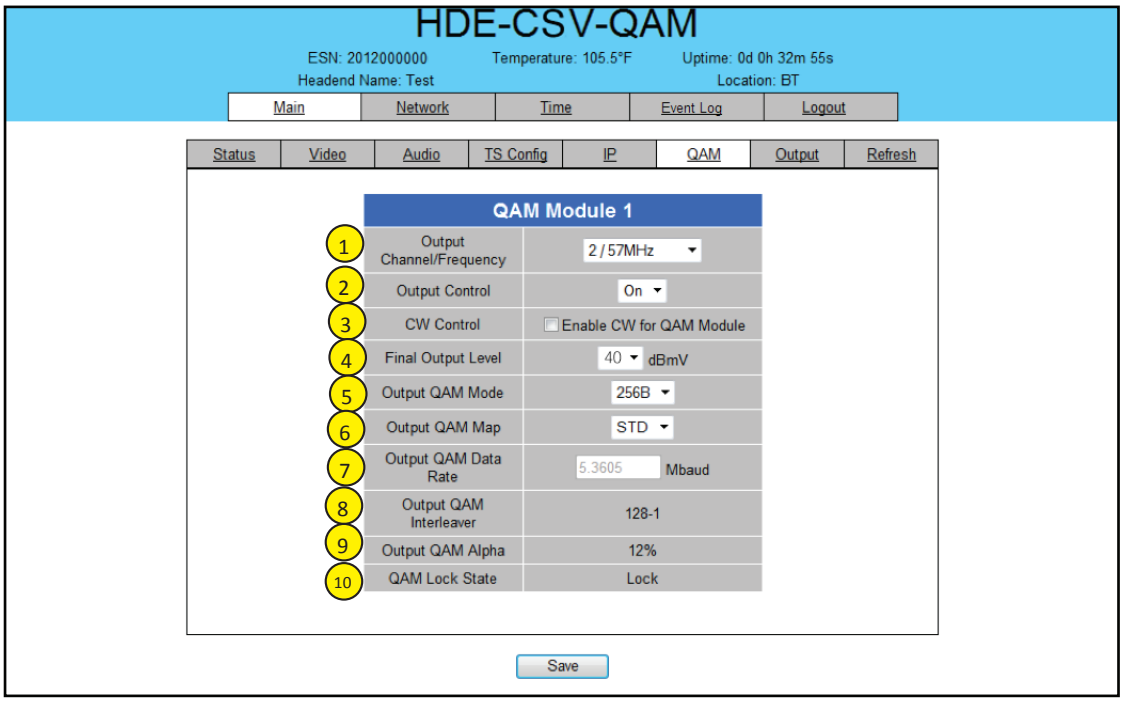



**Figure 5.7 - "Main > QAM" Screen**

1 **Output Channel/Frequency:** must assign an RF channel number to the RF QAM output of the QAM module (i.e. RF channel 2, as shown in Figure 5.7). The range is CATV channels 2 to 158.

**The RF Channel number will be displayed on TV only if the source stream does not carry any virtual channel number.**

2 **Output Control:** allows the user to turn the RF channel On/Off.

3 **CW Control:** allows the user to switch the QAM output mode to CW (Continuous Waveform) which activates an analog carrier at the selected channel’s center frequency; this is typically used in level adjustment of the system.

4 **Final Output Level:** must select the QAM RF output level for the output. The range is 32 to 42 dBmV. It is recommended to maintain the output level at 40 dBmV for normal operation.

5 **Output QAM Mode:** must select the desired QAM modulation mode. Possible options are: 64B, 256B, 16A, 32A, 64A, 128A, and 256A. For most applications in the USA, the recommended QAM modulation mode is 256B.

6 **Output QAM Map:** must select the desired QAM Map. Possible options are STD, IRC, and HRC.

7 **Output QAM Data Rate:** indicates the maximum data rate depending on the selected QAM mode, for example 5.3605 Mbaud for QAM 256B.

8 **Output QAM Interleaver:** indicates the interleaver value for the QAM mode.

9 **Output QAM Alpha:** indicates the Alpha value for the QAM mode

10 **QAM Lock State:** indicates whether QAM module is working properly (locked) or not.

**NOTE:** The module may take a few seconds to lock when QAM output parameters are changed.

**Remember to click on the SAVE button to apply the new values/configurations.**

## 5.8 "Main > Output" Screen

The “Main > Output” screen (Figure 5.8) is a “read and write” screen to assign the TS to desired IP, QAM, and ASI outputs:

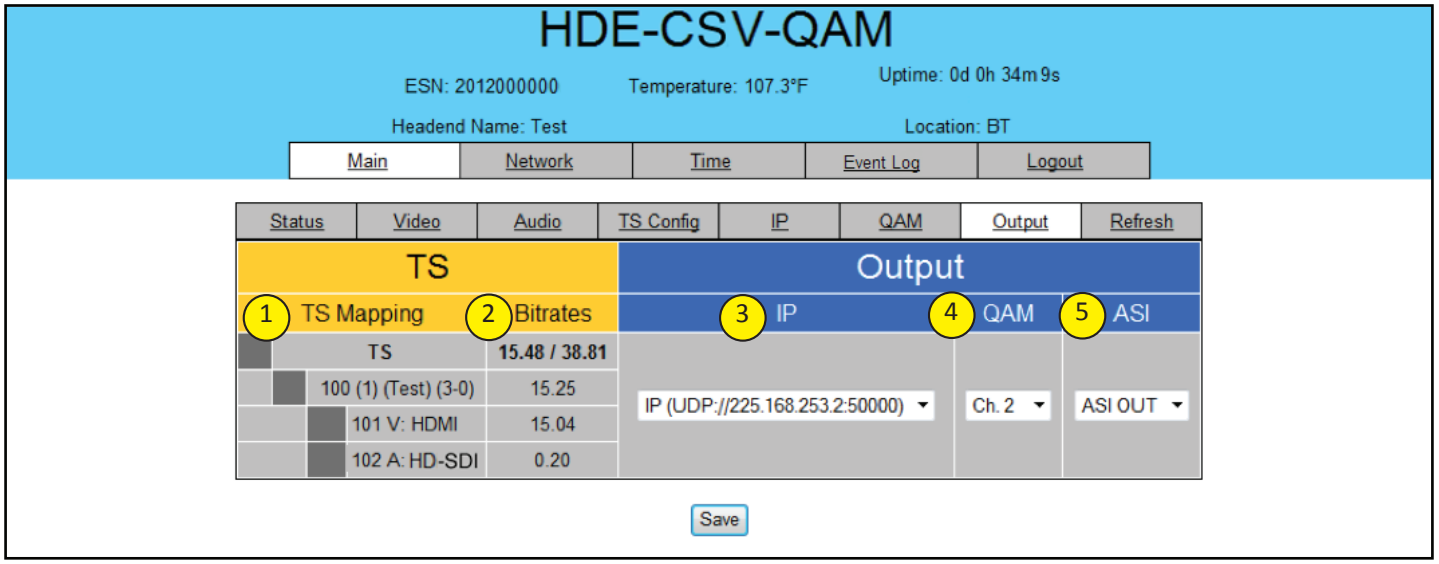



**Figure: 5.8 -"Main > Output" Screen**

In the section entitled "**TS**" under and orange header, the following parameters about the TS are displayed:

1 **TS Mapping:** indicates the program assigned to the TS. The program information includes the PMT PID, Program number, Short Name, Major-minor channel number. For example, under TS [100 (1) (Test) (3-0)] the following information is displayed:

100 - indicates the Program MAP Table (PMT) of the program.

1 - indicates the Program number as assigned in 7 of Section 5.5.

Test - indicates the Short Name as assigned in 8 of Section 5.5.

3-0 - indicates the Major - minor channel number as assigned in 9 and 10 of Section 5.5.

101 V: HDMI - indicates that the input video source is HDMI and the elementary stream PID is 101.

102 A: HD-SDI - indicates that the input audio source is HD-SDI and the elementary stream PID is 102.

2 **Bitrates:** indicates the assigned transport stream bitrate (see 2 of Section 5.3 for details) and the TS Bitrate (see 2 of Section 5.5 for details).

In the section entitled **"Output"** under blue header, the following parameters about the output TS are displayed:

3 **IP:** select the IP address, and the port number to which TS is assigned (see 1 of Section 5.6 for details).

4 **QAM:** select the QAM RF channel number of the QAM output (see 1 of Section 5.7 for details).

5 **ASI:** select the physical ASI OUT port number to which TS is assigned.

**To disable either IP, QAM, or ASI output, select option "None" in 3 , 4 & 5 respectively.**

**Remember to click on the SAVE button to apply the new values/configurations.**

## 5.9 ”Main > Refresh" Tab

The "Main > Refresh" tab can be clicked while you are on any of the following sub-tabs screens: "Status", "Video", "Audio", "TS Config", "IP", "QAM", and "Output". When clicked, it will update all relevant fields/ parameters of the active screen as that information is retrieved from the HDE-CSV-QAM in a real time basis.

## 5.10 "Network" Screen

The “Network” screen (Figure 5.9) is a read and write screen where the following parameters are displayed or configured:

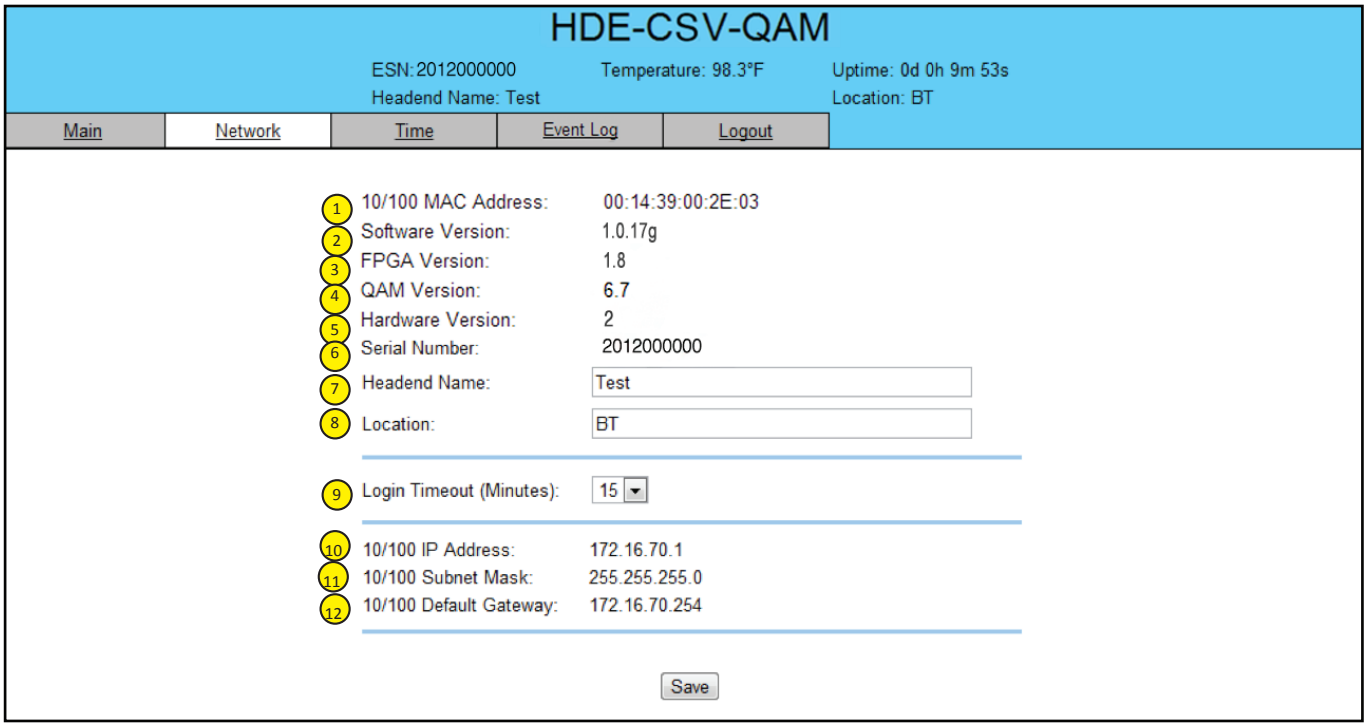



**Figure 5.9 - "Network" Screen**

1. **10/100 MAC Address:** indicates the MAC Address of the "Remote Control/Data 10/100" Port.
2. **Software Version:** indicates the software version of the unit.
3. **FPGA Version:** indicates the current hardware version of the unit's FPGA chipset.
4. **QAM Version:** indicates the current software version of the unit's QAM output module.
5. **Hardware Version:** indicates the current hardware version of the unit.
6. **Serial Number:** indicates the unit's serial number.
7. **Headend Name:** a user-defined field to make identification easier.
8. **Location:** another user-defined field to make identification easier.
9. **Login Timeout (Minutes):** indicates the period of time before the unit logs itself out if there is no activity on the web screens. Range is 5, 15, 30, or 60 minutes.
10. **10/100 IP Address:** see 14 of Section 5.10.1 for details.
11. **10/100 Subnet Mask:** see 15 of Section 5.10.1 for details.
12. **10/100 Default Gateway:** see 16 of Section 5.10.1 for details.

**Remember to click on the SAVE button to apply the new values/configurations.**

### 5.10.1 "Admin.html" Hidden Screen

To change/modify the IP network parameters, as well as the Username and Password values for the unit, you must be logged in to the unit as “Admin” to access a hidden screen shown in Figure 5.9.1 by typing the URL of the unit followed by a forward slash and Admin.html, for example: http://172.16.70.1/Admin.html.

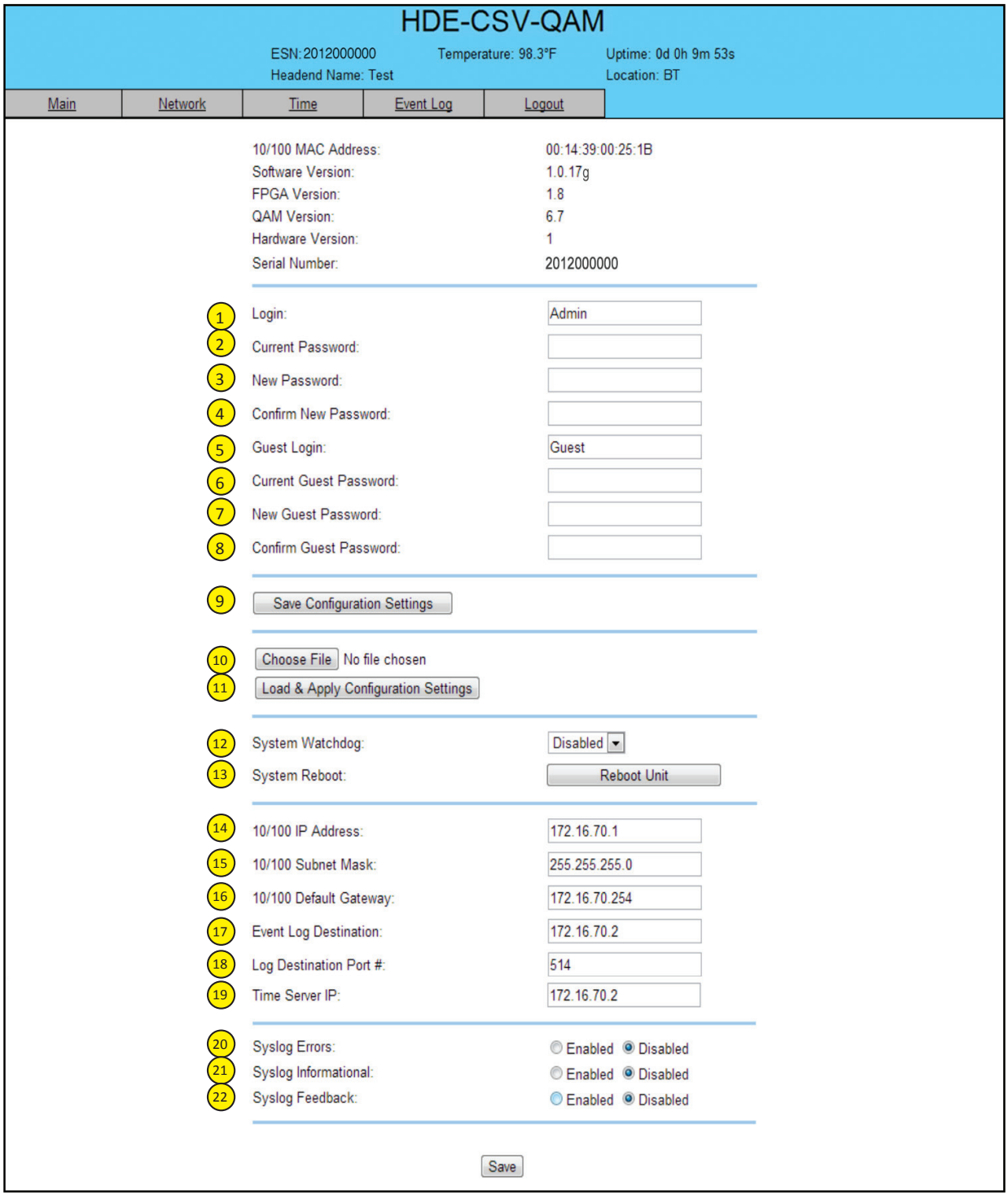



**Figure 5.9.1 - ”Admin.html” Hidden Screen**

The following parameters can be modified:

1. **Login:** is the Administrator's login (10 characters maximum). This login allows the user to make changes to any area of the unit. The factory default Login is "Admin". Login is case sensitive.
2. **Current Password:** is the Administrator's Current Password (10 characters maximum). The factory default password is "pass". Password is case sensitive and will not be displayed.
3. **New Password:** used only if the user wants to change the current Administrator's password. Must enter a new password (10 characters maximum). Password is case sensitive and will not be displayed.
4. **Confirm New Password:** must enter the same password as entered in 3 above. If password entered in 3 & 4 does not match, an error will be displayed.
5. **Guest Login:** is the Guest login (10 characters maximum). This login allows the user to view the unit settings but does not allow any changes. The factory default Guest Login is "Guest". Login is case sensitive.
6. **Current Guest Password:** is the Current Guest Password (10 characters maximum). The factory default Guest password is "pass". Password is case sensitive and will not be displayed.
7. **New Guest Password:** used only if the user wants to change the current Guest password. Must enter a new password (10 characters maximum). Password is case sensitive and will not be displayed.
8. **Confirm Guest Password:** must enter the same password as entered in 7 above. If password entered in 7 & 8 does not match, an error will be displayed.
9. **Save Configuration Settings:** allows the user to download and save the existing configuration of the unit in a .dat file format.
10. **Choose File:** allows the user to select the desired Config file from any location on the computer to be uploaded to the unit.
11. **Load & Apply Configuration Settings:** allows the user to upload a newly created file or update an existing file.
12. **System Watchdog:** when Enabled, automatically reboots the unit if, the Operating System stops working or the Status LED turns stable green or Off. When Disabled, manual reboot is required in case of above events.
13. **System Reboot:** allows the user to reboot HDE-CSV-QAM.
14. **10/100 IP Address:** is the static IP address that is assigned to the unit. It allows the user to access the unit via the web interface and also receive IP output. The factory default IP address is 172.16.70.1.
15. **10/100 Subnet Mask:** is the Subnet Mask address of the unit. It allows the user to access the unit from another network via the web interface. The factory default Subnet Mask is 255.255.255.0.
16. **10/100 Default Gateway:** is the gateway address of unit. It allows the user to access the unit from another network via the web interface. The factory default Subnet Mask is 172.16.70.254.
17. **Event Log Destination:** is the IP address of the remote server, to which Syslog sends the activities recorded by HDE-CSV-QAM for monitoring and troubleshooting purposes. The factory default value is 172.16.70.2.
18. **Log Destination Port #:** is the Error Log Destination port to which a duplicate of the error messages created by the unit can be forwarded for monitoring and troubleshooting purposes. The factory default value, which cannot be modified, is 514.
19. **Time Server IP:** is the IP address for the Time Server from where the unit can obtain its clock reference (see Section 5.11 for details). The factory default value is 172.16.70.2.
20. **Syslog Errors:** is to enable/disable HDE-CSV-QAM to forward error messages (in red font) to syslog. The factory default value is disabled.
21. **Syslog Informational:** is to enable/disable HDE-CSV-QAM to forward information messages (in blue font) to syslog. The factory default value is disabled.
22. **Syslog Feedback:** is to enable/disable HDE-CSV-QAM to forward feedback or confirmation messages (in green font) to syslog. The factory default value is disabled.

**Remember to click on the SAVE button to apply the new values/configurations.**

## 5.11 "Time" Screen

The “Time” screen (Figure 5.10) is a “read and write” screen that allows you to set the current date and time for the HDE-CSV-QAM. To remain compliant with ATSC and cable standards, it is important to have the accurate date and time stamps. For this reason, it is recommended to use the “NTP Server” option which allows the unit to automatically acquire time settings from a "NTP Server" - you must enter the IP address of the time server (see 19 of Section 5.10.1 for details).

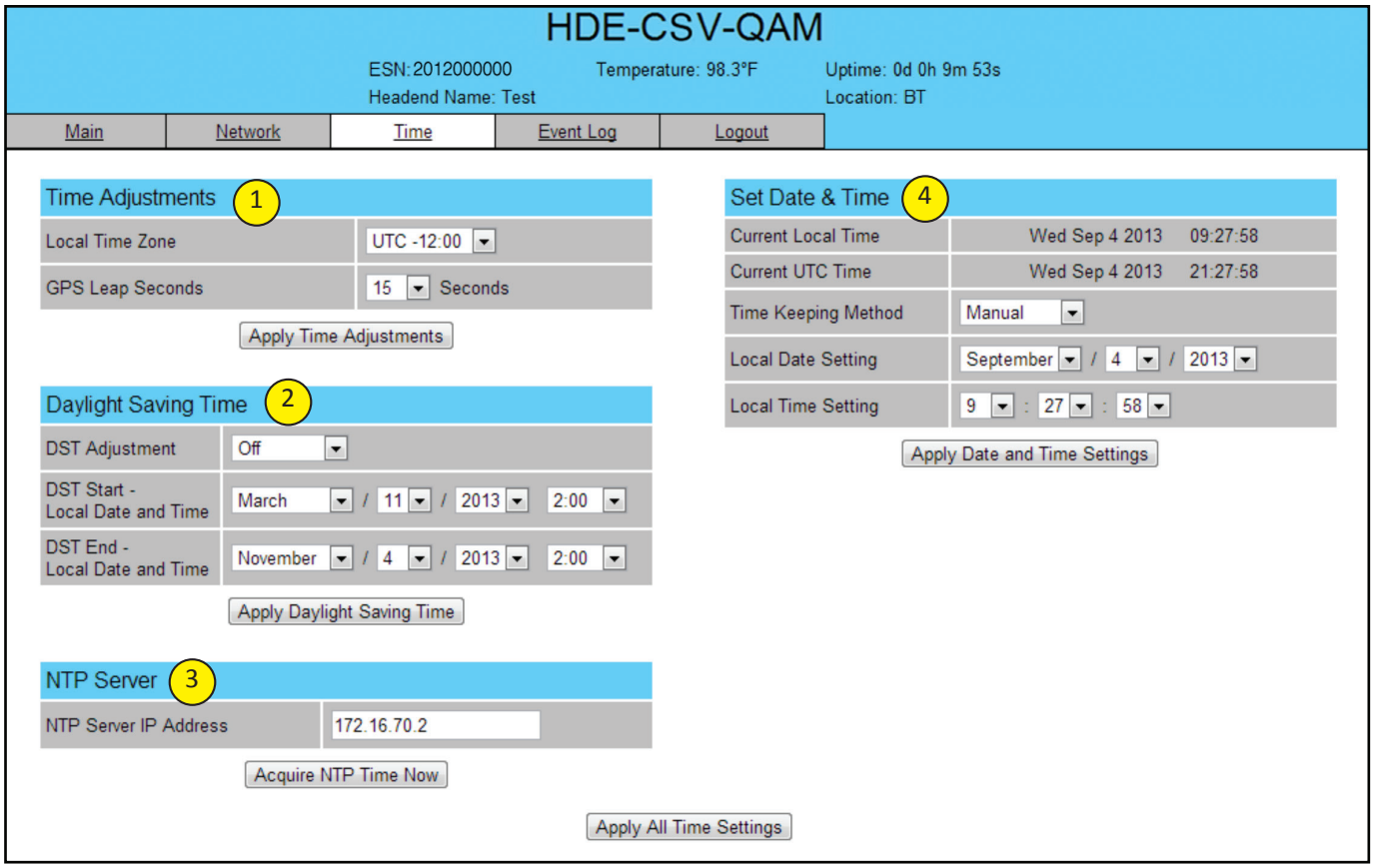



**Figure 5.10 - "Time" Screen**

1. In the section entitled **“Time Adjustments”**, the local time zone based on Coordinated Universal Time (UTC) can be set.

2. In the section entitled **“Daylight Saving Time”**, the user can set the Daylight Saving Settings either manually or automatically using the DST Adjustment option.

3. In the section entitled **“NTP Server”**, the user can enter the IP address of the NTP server to acquire the time directly from the NTP Server when an internet connection is available.

4. In the section entitled **“Set Date & Time”**, the user can manually enter the date and time.

## 5.12 "Event Log" Screen

The “Event Log” screen (Figure 5.11) is a “read and write” screen where the following parameters can be displayed or configured. The data in Event Log can be forwarded to a SysLog database – (see 20 , 21 , & 22 of Section 5.10.1 for details). The lines are color coded as follows:

Red font = error message
Blue font = information message
Green font = confirmation or feedback message

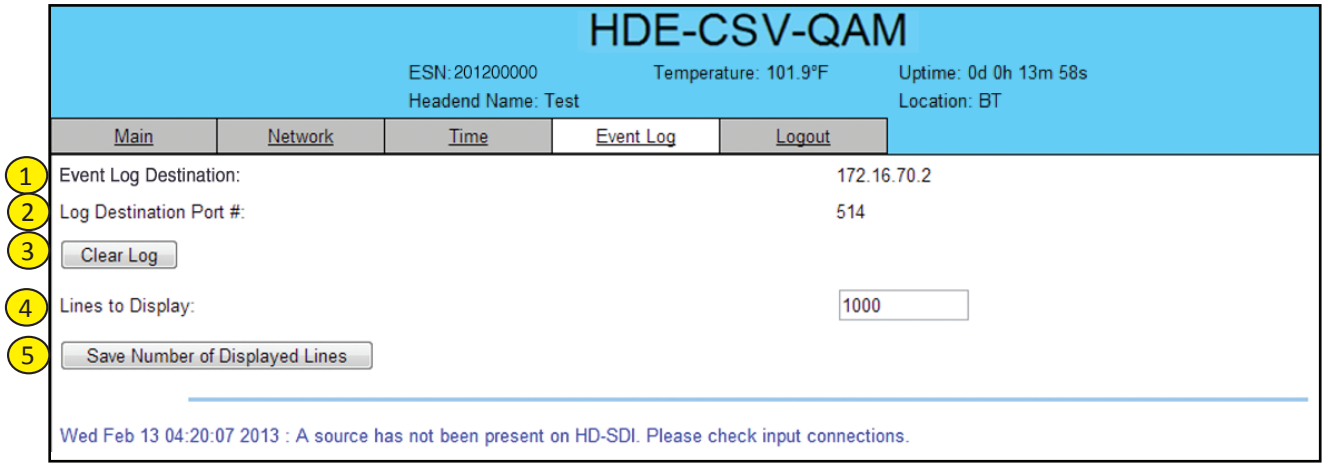



**Figure 5.11 - "Event Log" Screen**

1 **Event Log Destination:** see 17 of Section 5.10.1 for details.

2 **Log Destination Port #:** see 18 of Section 5.10.1 for details.

3 **Clear Log:** allows to clear the records generated during unit’s boot-up process and operation afterward. The records are cleared if the unit loses power.

4 **Lines to Display:** allows the user to select the number of lines to be displayed. The unit supports up to 400 Mb of data or approximately 65,000 lines. The range is 1 to 65,535.

5 **Save Number of Displayed Lines:** allows the user to save the error log on the screen. Please note that the error log would be saved only on the screen and not on any database.

## Appendix A: Updating the Software Remotely

**General background:**

There is one PROM that needs to be programmed in HDE-CSV-QAM.

The total procedure takes about 10 minutes if you follow the steps below.

Step 1: FTP the file from your PC to HDE-CSV-QAM.

Step 2: Update PROM with the specific command line.

**Step 1: FTP the File to HDE-CSV-QAM:**

FTP file (EPCS_ver#.bin) into the HDE-CSV-QAM server board (there are many ways to do this).

**NOTE:** a) The EPCS_ver#.bin is to program PROM.
b) All the commands are case sensitive
c) It is recommended to copy the EPCS_ver#.bin file in the root directory. i.e, My Computer > C:

From a command (DOS) prompt (you must be in the same folder as the EPCS file) enter:

**ftp –A 172.16.70.1**

At the FTP prompt enter the following commands:

{Please ensure that you have entered the “bin” command to confirm that you are FTPing the file as binary file.}

**bin**

**put EPCS_ver#.bin**

**bye**

The above four commands may be automated by entering them in an ASCII text file (called ftpcmd, recommended but can be any name) and executing the following:

**ftp -A -s:ftpcmd 172.16.70.1**

You can place the ftp command above in a batch file (.bat) then double click on the .bat file to perform the entire download process.

**Telnet to HDE-CSV-QAM:**

There are two ways to telnet to the HDE-CSV-QAM:

(1) Use Command line and type in " telnet IP address " for example "telnet 172.16.70.1"

(2) Use the Terminal program such as Putty to telnet.

Use a terminal program such as Putty to telnet into the server board (can use Linux, DOS prompt, Putty, etc)

You can save your configurations so it's very quick and easy to telnet into the board again.

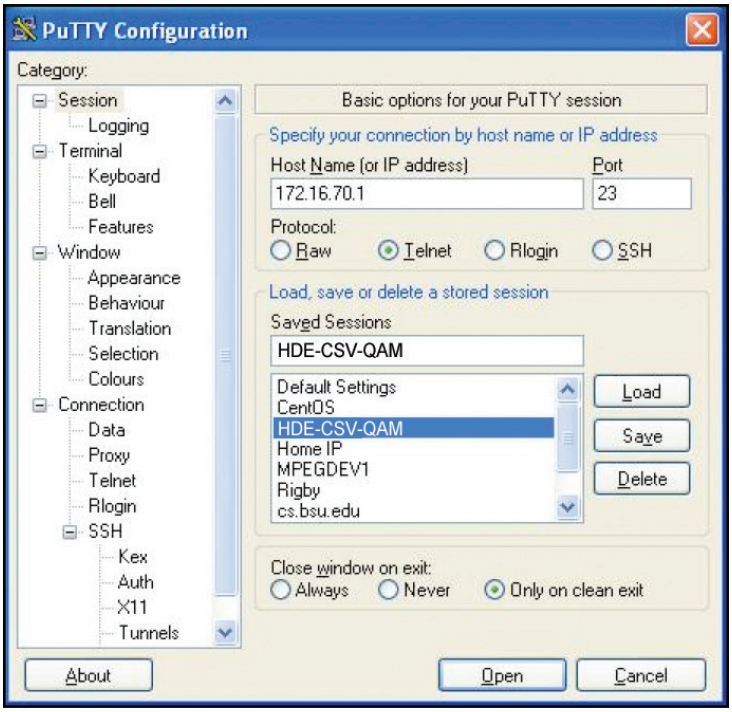



**Figure 5.12**

After you telnet into the server board you must login into the unit with the following credentials:

Username = **Admin** (case-sensitive)
Password = **pass** (case-sensitive)

Then cd to the /home/ftp directory where the EPCS_ver#.bin file have been placed.

**cd home/ftp**
**ls**

**Step 2: Update PROM:**

Now you can use the field update utility (epcs) to program the EPCS PROM. This is a custom utility that resides in HDE-CSV-QAM.

Care should be taken at this time, if misspelled characters or letters are typed by accident, or you have missed to type the bin command in Step 1, this could cause the HDE-CSV-QAM Flash memory to be corrupted The HDE-CSV-QAM will try to reload the OS using the corrupted file ten (10) times before it displays the following screen (Figure 5.13). You can recover from this situation by repeating the procedure all over again from Step 1 above.

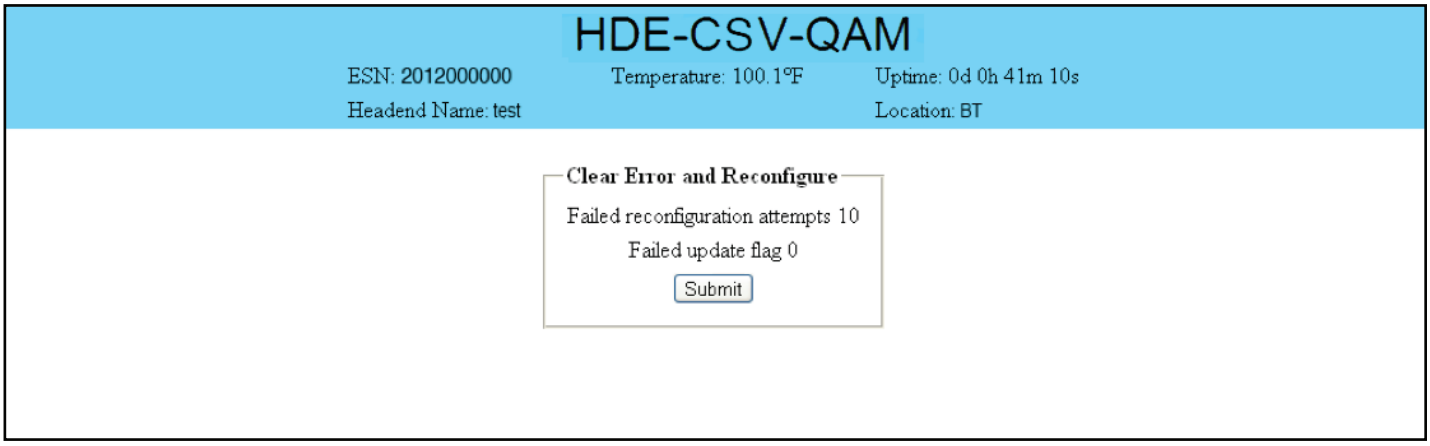



**Figure 5.13**

Ready: Please read the rest of this page once before typing the commands.

Update FPGA by programming EPCS:

**epcs –e1 EPCS_ver#.bin**

> **NOTE:** EPCS PROM can be programmed concurrently using two different terminal sessions (logins). If you get errors during programming then **DO NOT TURN OFF THE HDE-CSV-QAM**, just repeat the epcs commands again.

The server board should now configure itself on power-up.

Two choices to reset the HDE-CSV-QAM:

(1) Reset switch in the back of the unit.

(2) Use Telnet and type “epcs –c” this will automatically reboot the HDE-CSV-QAM without a need for resetting with power switch.

**NOTE**: The boot-up process for HDE-CSV-QAM is approximately 30 seconds.

## Appendix B: Viewing the IP output on a VLC Media player

To view the IP output from the HDE-CSV-QAM on a VLC Media player in a computer or laptop, the procedure is divided into two steps:

Step 1: Change the IP address of the computer

Step 2: Using the VLC Media Player

**NOTE:** Step 1 needs to be followed only if an unicast IP address is assigned in the "Destination IP" field on the "Main > IP" screen (see (1) of Section 5.6 for details). If multicast IP address is used, then go to Step 2.

**Step 1: Change the IP address of the computer**

i) Change the IP address of the computer to match the "Destination IP" updated on the "Main > IP" screen (see (1) of Section 5.6 for details and see Section 4 for instructions to change IP address of a computer).

**Step 2: Using the VLC Media Player**

i) Open VLC Media Player.

ii) Select **Media → Open Network Stream**.

iii) Under the **"Network Protocol"** field, enter the network address using any one of the formats depending on the "Encapsulation" method selected on the "Main > IP" screen (see (2) of Section 5.6 for details):

**rtp://@<ip address>:<port no.>**
eg: rtp://@239.10.10.31:50001

or

**udp://@<ip address>:<port no.>**
eg: udp://@192.168.253.100:50055

**NOTE:** For uni-cast, the <ip address> will be the IP address of the computer. For multicast, the <ip address> will be the multicast address assigned under the "Destination IP" on "Main > IP" screen (see (1) of Section 5.6 for details).

iv) Select Play.

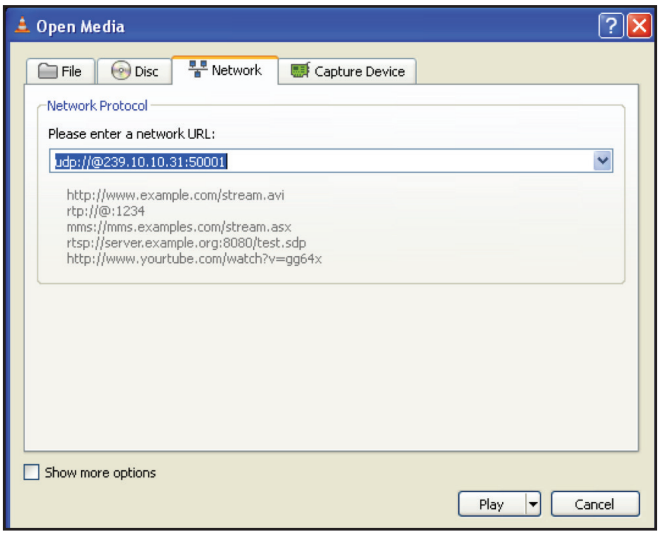



**Figure 5.14**

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