



SOLUTIONS FOR ALL YOUR APPLICATIONS

Stock
No. 6370 IP
User Manual

MPEG-2 HD Encoder

HDE-8C-QAM/IP

8xComponent/Composite + 1xSpare inputs

4xQAM + / 8xIP outputs

EAS compatible

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

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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

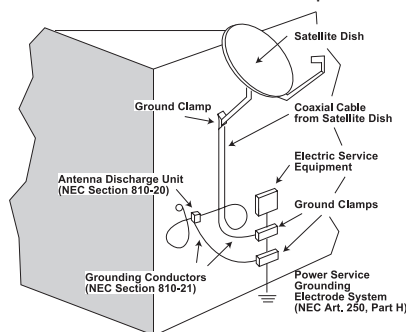


**YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE
AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.**

- **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 1st release of the manual.

2.2 Product Application & Description

Application:

HDE-8C-QAM/IP (MPEG-2 HD Encoder – 8xComponent/8xComposite – 4xQAM) accepts up to eight (8) analog programs from any of the following inputs: 8xComponent and 8xComposite. The encoder is equipped with a spare input (9th input) to replace any one (1) of the primary eight (8) inputs in the event of a failure.

The encoder digitizes, MPEG-2 encodes each input into a high-definition stream, multiplexes the resulting eight (8) program streams, and then modulates them onto four (4) adjacent QAM channels in the 54-1002 MHz range (CATV 2-158). Any one (1) of the four (4) QAM output streams is also available in ASI format.

The encoder supports Dolby® Digital audio encoding, and Closed Captioning (EIA-608). It is also equipped with an Emergency Alert System (EAS) interface. A front-panel RF test point allows for monitoring/testing of the QAM output without service interruption.

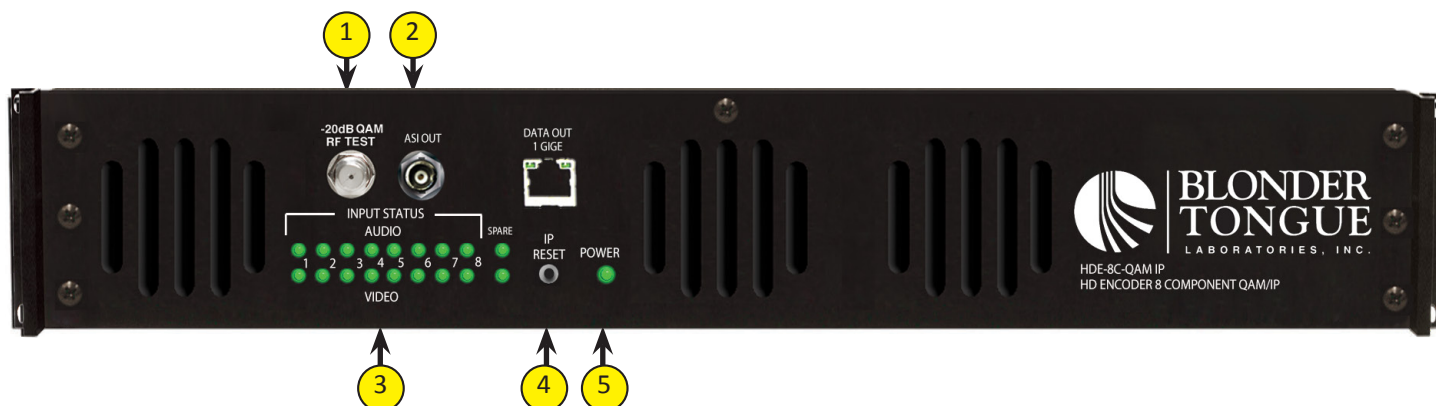
Comprehensive remote monitoring and control is accomplished using any standard Web browser via a rear-panel 10/100Base-T Ethernet connection.

Features:

- Accepts up to 8 programs from any of the following inputs: 8xComponent and 8xComposite
- Supports additional 1 spare input to replace the failed input
- Digitizes, MPEG-2 encodes, and multiplexes up to 8 inputs into 4 QAM output channels (2 programs per QAM channel)
- Provides any 1 of the 4 QAM output streams in ASI format
- Compatible with ITU Annex A and B digital QAM formats
- Provides comprehensive GUI-based monitoring and control via standard Web browsers
- Provides a front-panel RF test point (at 20dB below primary QAM output)
- Equipped with EAS interface (Analog Video + L/R Audio)
- Supports Real-time Dolby® Digital audio encoding
- Supports Closed Captioning EIA-608
- Supports user-defined PSIP configuration

Description:

Front panel connectors and indicators:

**1 -20dB QAM RF TEST:**

“F” connector for RF testing @ 20dB below the main QAM RF output.

2 ASI OUT:

The “ASI OUT” BNC connector delivers any one (1) of the four (4) QAM output and is typically used as input to an external modulator.

3 INPUT STATUS LEDs:

LEDs indicate the status of audio and video of each of the eight (8) inputs plus the spare input as follows:

Audio LED

Green = Audio input is detected and has no errors
Red = Audio input with error
Off = Audio input not detected

Video LED

Green = Video input is detected and has no errors
Red = Video input with error
Off = Video input not detected

Audio and Video LED's in Spare Mode

When the Spare Mode is enabled, both audio and video LEDs on the spare input (#9) and its user assigned replacement input will blink green. The LED indicators will return to their previous states when the mode is disabled.

Audio and Video LED's in EAS Mode

When EAS is activated, the Audio LEDs will change one at a time to red starting from Input # 1 and moving right towards Input #8. The sequence continues on the Video LED row, again starting at input #1 and moving right. After all LEDs are have turned red they all simultaneously switch back to green and the cycle begins again, continuing until EAS has been deactivated.

4 IP RESET:

When pushed and held for about 10 seconds, the power LED will blink once to confirm reset operation. The encoder defaults to the original IP address, Usernames, and Passwords as shipped from the Factory (shown below).

IP address = 172.16.70.1

Username = Admin (case-sensitive)

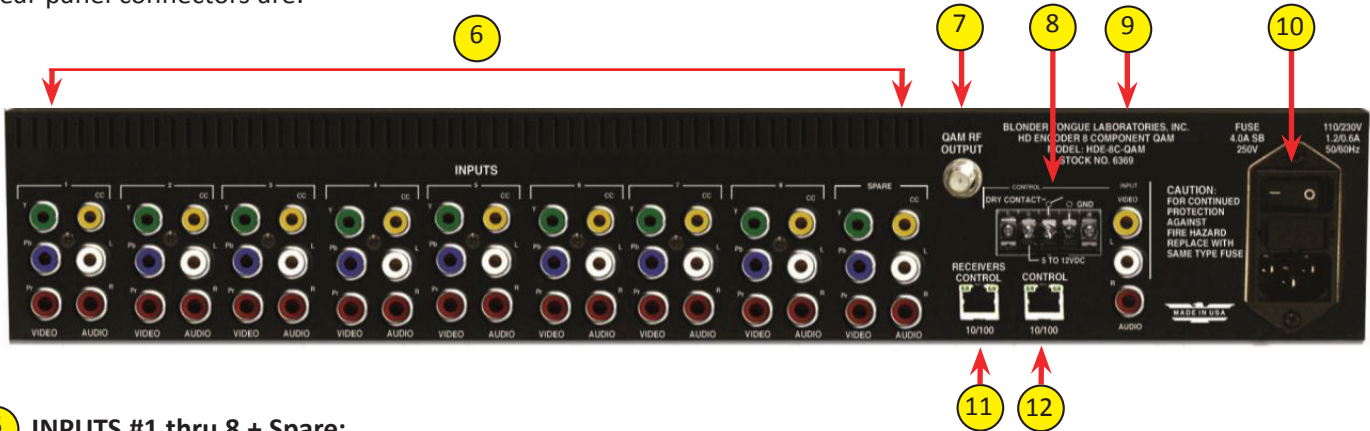
Password = pass (case-sensitive)

5 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).

Rear panel connectors are:



6 INPUTS #1 thru 8 + Spare:

RCA connectors for Video and Audio inputs marked as follows:

Y, Pb, Pr - Analog Component Video

Y – Composite Video

CC – 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 inputs.

L, R - Analog Left/Right Audio

7 QAM RF OUT:

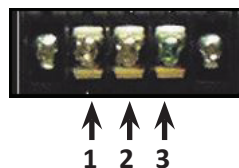
“F” connector for up to four (4) QAM RF outputs.

8 EAS CONTROL:

Terminal strip to activate the EAS messaging feature in one of two the following ways:

a) 5-12 VDC between terminals 1 & 3 shown below

b) Dry Contact between terminals 2 & 3 shown below



NOTE: This feature is intended to activate EAS and override all the input programs (whether Component or Composite) with the EAS INPUT (see 9 below for details). The QAM RF OUT (see 7 above), ASI OUT (see 2) will all contain the video and audio present at the corresponding RCA connectors of the EAS INPUT.

9 EAS INPUTS:

RCA connectors for EAS Analog Audio (marked L & R) and Composite Video (marked Video) inputs.



EAS feature is functional only when (i) EAS Control is triggered ON, and (ii) Video/audio is detected on EAS INPUT connectors. The EAS feature will not be functional unless both these conditions are met.

10 INPUT POWER:

IEC 14 power inlet plug - rated 110/230 VAC; 1.2/0.6A; 60/50 Hz; equipped with Slo-Blo, 4.0 Amps, 250 V Fuse and On/Off switch.

11 RECEIVERS CONTROL 10/100 (FUTURE OPTION):

RJ45 connector for 10/100Base-T Ethernet interface for controlling select satellite receivers.

12 CONTROL 10/100:

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

2.3 Product Specification

Input

Component	
Primary Connectors:	8 sets each 3x RCA for Video (Y, Pb, Pr) 8 sets each 2x RCA for Analog Audio (L, R)
Spare Connectors:	3x RCA for Video (Y, Pb, Pr) 2x RCA for Analog Audio (L, R)
Video Resolution:	480i, 720p, & 1080i
Video Aspect Ratio:	4:3 & 16:9
Composite Video	
Primary Connectors:	8 sets each 1x RCA for Video (Y) 8 sets each 2x RCA for Analog Audio (L,R) (shared with component connectors)
Spare Connectors:	1x RCA for Video (Y) 2x RCA for Analog Audio (L,R) (shared with component connectors)
Video Resolution:	480i
EAS (Emergency Alert System)	
Connectors:	3x RCA (Video, Audio L & R)
Trigger Mechanism:	5-12 VDC & Dry Contact Closure (Terminal Strip)
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)
Audio	
Output Format:	Dolby® Digital
Sampling rate:	48 kHz
Bit rate:	Variable; 128-320 Kbps (user-selectable)
Closed Captioning	
Component:	EIA- 608; 1x RCA (CC)
Composite:	EIA-608

Output

QAM	
Connector:	1x "F" Female (rear panel; up to 4x RF QAM ch. combined)
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)
Channel Bandwidth:	24 MHz (4x Adjacent 6 MHz)
RF Level:	+40 dBmV \pm 1 dB (4 channels combined)
RF Level Adjustment Range:	+35 to +42 dBmV, 1 dB increments
Frequency Tolerance:	\pm 0.5 kHz @ 77 °F (25 °C)
Frequency Stability:	\pm 5 kHz over 32 to 122 °F (0 to 50 °C)
Amplitude Flatness:	\pm 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:	39 dB typical
I/Q Phase Error:	Less than 1 degree
I/Q Amplitude Imbalance:	Less than 1%
ASI	
Connector:	1x BNC (front-panel)
Output Assignment:	Any 1 of 4 QAM output streams
Format:	DVB-ASI
Standard:	ETSI EN 50083-9
GigE	
Connector:	1x RJ45 (front panel)
Standard:	1000BASE-T Ethernet
UDP/RTP:	Supported (user-selectable)
Address Assignment:	8x IPv4 Address and port numbers (user-selectable)

General

Dimensions (W x D x H):	19.0 x 19.5 x 3.5 inches (483 x 495 x 89 mm)
Power:	110 - 230 VAC, 50/60 Hz (Fuse: 4.0A, 250 VDC, Slo Blo)
Power Dissipation:	~60 W (max)
Weight:	~15 lbs (6.8 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:	16x Input Status LEDs (Video 1-8; Audio 1-8) 2x Spare LEDs (Video & Audio) 1x Power LED
Local Control:	1x "F" Female RF Test Port 1x IP Reset button
Remote Monitoring/Control:	GUI-based menu via Web browser (1x RJ45 connector; 10/100Base-T)

Section 3 – Installation & Power-up

3.1 Unpacking

You will find the following items in the box:

- HDE-8C-QAM/IP Encoder (QTY=1)
- Power Cord with IEC C13 line socket and 3-pin Type B NEMA 5 plug (QTY=1)
- A hardware bag (item 741021300) containing the following:

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

3.2 Installation

The HDE-8C-QAM/IP encoder is designed to be installed in a standard 19-inch (483 mm) rack (EIA 310-D, IEC 60297, and DIN 41494 SC48D).

To install the encoder, secure the unit's front panel to the rack by inserting four (4) machine screws, with cup washers, through the four (4) mounting holes in the front panel.



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

3.3 Power-up

Connect the line cord to a 110/230 VAC, 60/50 Hz outlet. Please note that the IEC power connector on the rear panel of the unit is equipped with an ON/OFF switch and a fuse (SLO-BLO, 4.0 Amp, 250V).

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 your computer's IP address to be in the same subnet as the unit's default IP address. 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 rear-panel RJ45 interface marked "Control 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 described in following sections. 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, Inputs, Encoder, 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 Input, PID and Output information of each of the four (4) transport streams (TS). Each TS contains two (2) programs:

ESN: 2015010129

Headend Name: eng'g

Temperature: 96.5°F

Location:

Uptime: 17d 18h 12m 33s

Main

Network

Time

Event Log

Update

Logout

Status		Inputs	Encoder	Output	Refresh								
Input				TS	Output								
1	Resolution	2	Input	3	Bitrate	4	TS Mapping	5	IP Output	6	RF Chan	7	Status
1	1080i 29.97	Name: channel 2	17.79 Mbps	64 (1) (test1) (3-1)	65 Video	66 Audio	80 (2) (test 2) (3-2)	81 Video	82 Audio	UDP://239.10.10.10:50000	50 / On	Locked	
2	1080i 29.97	Name:	17.79 Mbps	96 (3) (test 3) (3-3)	97 Video	98 Audio	112 (4) (test 4) (3-4)	113 Video	114 Audio	UDP://239.10.10.10:50001	51 / On		
3	1080i 29.97	Name:	17.79 Mbps	128 (5) (test 5) (3-5)	129 Video	130 Audio	144 (6) (test 6) (3-6)	145 Video	146 Audio	UDP://239.10.10.10:50002	52 / On		
4	1080i 29.97	Name:	17.79 Mbps	160 (7) (test 7) (3-7)	161 Video	162 Audio	176 (8) (test 8) (3-8)	177 Video	178 Audio	UDP://239.10.10.10:50003	53 / On		
5	1080i 29.97	Name:	17.79 Mbps										
6	1080i 29.97	Name:	17.79 Mbps										
7	1080i 29.97	Name:	17.79 Mbps										
8	1080i 29.97	Name:	17.79 Mbps										
Spare Input													
Resolution			Input		8	Configured to Replace							
1080i 29.97			Name:		Input 3								

Figure 5.2 - "Main > Status" Screen

In the section entitled "Input" under green header, the following parameters about each input program in the TS are displayed:

- 1 **Resolution:** indicates the resolution and frame rate of the video input.
- 2 **Input:** indicates the user-defined name of the input source (see Section 5.3 for details).
- 3 **Bitrate:** indicates the bitrate of the input program.

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

- 4 **TS Mapping:** indicates the list of programs selected by the user to be assigned to each output TS (TS #1 thru 4). The program information includes the PMT PID, Program number, Short Name, Major-minor channel number (see Section 5.5.1 for details).

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

- 5 **IP Output**
- 6 **RF Chan:** indicates (i) the RF channel number of the QAM output, and (ii) whether the output QAM is On or Off (see Section 5.5.2 for details).
- 7 **Status:** indicates whether the Quad-QAM RF output module is locked or not.

In the section entitled "Spare Input" under green header, the following parameters about the Spare Input (9th input) are displayed:

- 8 **Configured to Replace:** Displays the assigned input for spare replacement (see Section 5.3 details).

5.3 "Main > Inputs" Screen

The "Main > Inputs" screen (Figure 5.3) is a "user-configurable" screen where the following input source parameters can be configured:

Figure 5.3 - "Main > Inputs" Screen

- ① **Input #:** indicates the physical input interface
- ② **Name:** enter a name to identify the input source device.
- ③ **Spare Input:** allows the user to select the type of input source. Possible options are Component, and Composite.
- ④ **Replace Input #:** allows the user to select the desired physical input interface number that can be replaced by the Spare (9th input) should it fail. Possible options are: Input#1 thru 8.
- ⑤ **Spare Mode:** should the input on physical interface as assigned in ④ above fail, allows the user to manually replace the failed input with the Spare Input (9th input; assigned in ③ above). Possible options are Enabled, and Disabled.



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

5.4 "Main > Encoder" Screen

The "Main > Encoder" screen (Figure 5.4.1) is a "user-configurable" screen and includes the following sub-tabs: Video and Audio.

5.4.1 "Main > Encoder > Video" Screen

The "Main > Encoder > Video" screen (Figure 5.4.1) is a "user-configurable" screen to select the video encoder parameters for each input program:

Figure 5.4.1 - "Main > Encoder > Video" Screen

- 1 **Bitrate:** allows user to enter the bitrate for each input video. It is recommended to ensure that the sum of the bitrates of the input videos in a TS, does not exceed "TS Bitrate" selected on the "Main > Output > TS Config" screen (see 2 of section 5.5.1 for details). Setting higher bitrates will provide greater video detail in comparison to lower bitrates, but may reduce the number of programs available within the TS. Typically HD programs use 12 to 17 Mbps and SD programs use 3 to 7 Mbps bitrates.
- 2 **Closed Caption:** is the process of passing EIA-608 Closed Captioning (CC) information and displaying the CC text on TV or other visual display. Possible options are Enabled, and Disabled. The factory default value is "Disabled".
- 3 **Input Format:** allows the user to select the type of input video source. Possible options are Component, and Composite.
- 4 **Video Filter Level:** 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:** possible options are Frame, or Field. The factory default value is Frame.
- 6 **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.
- 7 **Test Pattern:** is the video pattern that the encoder will display upon loss of input video. Possible options are: Color Bars, Black, Blue and Red screens.



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

5.4.2 "Main > Encoder > Audio" Screen

The "Main > Encoder > Audio" screen (Figure 5.4.2) is a "user-configurable" screen where the following parameters associated with the Dolby® Digital encoded stereo audio are configured and displayed for the each audio input:

HDE-8C-QAM

ESN: 2013000000 Temperature: 114.5°F Uptime: 0d 0h 6m 11s
Headend Name: Test Location: BT

Main Network Time Event Log Update Logout

Status Inputs Encoder Output Refresh

Video Audio

Input 1	Input 2	Input 3	Input 4	Input 5	Input 6	Input 7	Input 8
1 Data Rate: 192 kbps	2 Data Rate: 192 kbps	Data Rate: 192 kbps	Data Rate: 192 kbps	Data Rate: 192 kbps	Data Rate: 192 kbps	Data Rate: 192 kbps	Data Rate: 192 kbps
Delay: 0 ms	2 Delay: 0 ms	Delay: 0 ms	Delay: 0 ms	Delay: 0 ms	Delay: 0 ms	Delay: 0 ms	Delay: 0 ms
3 Sample Rate: 48 kHz	Sample Rate: 48 kHz	Sample Rate: 48 kHz	Sample Rate: 48 kHz	Sample Rate: 48 kHz	Sample Rate: 48 kHz	Sample Rate: 48 kHz	Sample Rate: 48 kHz
4 Audio Coding Mode: 2/0: L, R	4 Audio Coding Mode: 2/0: L, R	Audio Coding Mode: 2/0: L, R	Audio Coding Mode: 2/0: L, R	Audio Coding Mode: 2/0: L, R	Audio Coding Mode: 2/0: L, R	Audio Coding Mode: 2/0: L, R	Audio Coding Mode: 2/0: L, R
5 Dialog Normalization: -27	Dialog Normalization: -27	Dialog Normalization: -27	Dialog Normalization: -27	Dialog Normalization: -27	Dialog Normalization: -27	Dialog Normalization: -27	Dialog Normalization: -27
Dolby Surround Mode: Unspecified	6 Dolby Surround Mode: Unspecified	Dolby Surround Mode: Unspecified	Dolby Surround Mode: Unspecified	Dolby Surround Mode: Unspecified	Dolby Surround Mode: Unspecified	Dolby Surround Mode: Unspecified	Dolby Surround Mode: Unspecified
7 Line Mode: None	Line Mode: None	Line Mode: None	Line Mode: None	Line Mode: None	Line Mode: None	Line Mode: None	Line Mode: None
RF Mode: None	8 RF Mode: None	RF Mode: None	RF Mode: None	RF Mode: None	RF Mode: None	RF Mode: None	RF Mode: None

Save

Figure 5.4.2 - "Main > TS Map" Screen

- 1 **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.
- 2 **Delay:** allows the user to adjust the audio delay (-300 to 300 ms) to correct for input video/audio sync mismatch.
- 3 **Sample Rate:** indicates the input sampling rate of the encoder. The HDE-8C-QAM/IP supports 48 kHz sampling rate.
- 4 **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).
- 5 **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-8C-QAM/IP 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.
- 6 **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.
- 7 **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".
- 8 **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 7 and 8 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 loud 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 bandwidth 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 loud 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 > Output" Screen

The "Main > Output" screen (Figure 5.5.1) is a "user-configurable" screen and includes the following sub- tabs: TS Config, IP and QAM.

5.5.1 "Main > Output > TS Config" Screen

The "Main > Output > TS Config" screen (Figure 5.5.1) is a "user-configurable" screen where the following output parameters are configured and displayed for each output stream:

HDE-8C-QAM

ESN: 2015010129

Temperature: 85.7°F

Uptime: 2d 23h 22m
4s

Headend Name:

[Main](#)
[Network](#)
[Time](#)
[Event Log](#)
[Update](#)
[Logout](#)

[Status](#)
[Inputs](#)
[Encoder](#)
[Output](#)
[Refresh](#)

[TS Config](#)

[IP](#)

[QAM](#)

Multiplexed MPTS Output Configuration

	1 TS ID	2 TS Bitrate	3 Modulation Mode	4 Out of Band	5 ASI Output
TS1	1	QAM Modulator	QAM256	Disabled	<input checked="" type="radio"/>
TS2	2	QAM Modulator	QAM256	Disabled	<input type="radio"/>
TS3	3	QAM Modulator	QAM256	Disabled	<input type="radio"/>
TS4	4	QAM Modulator	QAM256	Disabled	<input type="radio"/>

Output Mapping

	6 Input	7 PID	8 Program Number	9 Short Name	10 Major Channel	11 Minor Channel
TS1						
	Input 1	64	1		3	1
	Video	65				
	Audio	66				
	Input 2	80	2		3	2
	Video	81				
	Audio	82				
TS2						
	Input 3	96	3		3	3
	Video	97				
	Audio	98				
	Input 4	112	4		3	4
	Video	113				
	Audio	114				
TS3						
	Input 5	128	5		3	5
	Video	129				
	Audio	130				
	Input 6	144	6		3	6
	Video	145				
	Audio	146				
TS4						
	Input 7	160	7		3	7
	Video	161				
	Audio	162				
	Input 8	176	8		3	8
	Video	177				
	Audio	178				

12 Save

Figure 5.5.1 - "Main > Output > TS Config" Screen

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

- 1 **TS ID:** user must enter the identification number for the output TS. The range is 1 to 65535. The TS ID assigned must be unique.
- 2 **TS Bitrate:** user must select bitrate for the TS. Possible options are:
 - QAM Modulator – Select this setting when using the QAM output of the encoder. The maximum bitrate will be 38.81 Mbps for QAM 256.
 - 19.39 Mbps – Select this setting when the primary encoder output will be ASI for an ATSC application.
 - 38.81 Mbps – Select this setting if an external QAM 256 modulator(s) will be used with the encoder’s ASI output(s).
- 3 **Modulation Mode:** user can 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-8C-QAM.

In the section entitled **“Output Mapping”**, the user can select and configure the following parameters for each output TS indicated by **“TS#”**, under gray header:

- 5 **ASI Output:** allows the user to select any one of the four transport streams to be provided on the front panel ASI output.
- 6 **Input:** indicates the list of the programs selected by the user that are included in the TS. It includes the Input program number, video source, and audio source.
- 7 **PID:** indicates the PID value assigned to 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 a MPTS 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)

- 8 **Program Number:** user must enter a unique output program number for each program. PMT (Program Map Table) provides information on each program present in the transport stream such as program number, and the list of the elementary streams (audio, video or data).



The Program Number must be unique in a MPTS output stream. If a duplicate Program Number exists, assign a different number in the range of 1 to 65535.

- 9 **Short Name:** user may enter the short name of the channel. Up to 7 alphanumeric characters are allowed.
- 10 **Major Channel:** user may enter the major channel number for the output program. The range is 1 to 99 for Terrestrial and 1 to 999 for Cable.
- 11 **Minor Channel:** user may enter minor channel number for the output program. The range is 1 to 99 for Terrestrial and 0 to 999 for Cable. **NOTE:** when zero (0) is entered as a minor channel, it sets the encoder to provide a one part virtual channel number as entered in the major channel field. For example, a major channel of “205” with a minor channel of “0” will be displayed as “205” on a TV. A major channel of “205” with a minor channel of “1” will be displayed on a TV as “205-1”.



Make sure that the major-minor channel pair is unique for each program on the MPTS output.



MPTS Output Stream ‘x’ and MPTS Output Stream ‘y’ may have same PID, Program Number, Major-minor channel pair as each MPTS output stream is a unique stream.

- 12 **Save:** if duplicate values exist for PID, Program Number, Short Name or Major – Minor Channel Pair in a MPTS output stream, when the SAVE button is clicked, the following pop-up window would appear accordingly: “Error! Duplicate Program Numbers found”.



Please ensure the duplicate values are edited & click on SAVE button AGAIN to apply the new values/configurations.

5.5.2 "Main > Output > IP" Screen

The "Main > IP" screen (Figure 5.8) is a "read and write" screen to assign the IP parameters for the TS:

HDE-8C-QAM

ESN: 2015010129
Headend Name:
Temperature: 87.5°F
Uptime: 2d 23h 26m 58s
Location:

Main
Network
Time
Event Log
Update
Logout

Status
Inputs
Encoder
Output
Refresh

TS Config
IP
QAM

IP Output Configuration

	1 Destination IP	2 Encapsulation	3 Destination Port	4 Source Port	5 Time to Live	6 Stuffing	7 Output Enable
TS 1 P1 SPTS	239.10.10.10	UDP ▾	50000	50000	128	Disabled ▾	Enabled ▾
TS 1 P2 SPTS	239.10.10.10	UDP ▾	50001	50001	128	Disabled ▾	Enabled ▾
TS 2 P1 SPTS	239.10.10.10	UDP ▾	50002	50002	128	Disabled ▾	Enabled ▾
TS 2 P2 SPTS	239.10.10.10	UDP ▾	50003	50003	128	Disabled ▾	Enabled ▾
TS 3 P1 SPTS	239.10.10.10	UDP ▾	50004	50004	128	Disabled ▾	Enabled ▾
TS 3 P2 SPTS	239.10.10.10	UDP ▾	50005	50005	128	Disabled ▾	Enabled ▾
TS 4 P1 SPTS	239.10.10.10	UDP ▾	50006	50006	128	Disabled ▾	Enabled ▾
TS 4 P2 SPTS	239.10.10.10	UDP ▾	50007	50007	128	Disabled ▾	Enabled ▾

Save

Figure 5.5.2 - "Main > IP" Screen

- 1 **Destination IP:** allows user to assign the IP address of the equipment to which the GigE 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 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) select the one that matches the protocol used by the receiving equipment.
- 3 **Destination Port:** user must enter the IP Port of the receiving equipment. The factory default value is 50000. The range is 1 to 65535. The port number assigned to each TS must be unique.
- 4 **Source Port:** user 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. The port number assigned to each TS must be unique.

NOTE: Port number is recommended to be from 49152 to 65535. Reason: Ports 1-1023 are reserved and 1024-49151 are registered ports

- 5 **Time to Live:** is limit to the amount of time 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 5.7 remains constant. Possible options are Enable and Disable. It is advisable to Disable stuffing when only GigE output is used to help reduce the traffic on the network.



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

- 7 **Output Enable:** Allows operator to Enable/Disable IP output

5.5.3 "Main > Output" Screen

The “Main > Output > QAM” screen (Figure 5.5.3) is a “user-configurable” screen to assign QAM parameters for the TS:

HDE-8C-QAM

ESN: 2015010129 Temperature: 87.5°F Uptime: 3d 0h 27m 55s
Headend Name: Location:

Main

Network

Time

Event Log

Update

Logout

Status

Inputs

Encoder

Output

Refresh

TS Config

IP

QAM

QAM Parameters

1

Output Channel/Frequency

50 / 381MHz

51 / 387MHz

52 / 393MHz

53 / 399MHz

2

Output Control

On

On

On

On

3

CW Control

☐ Enable CW for QAM Module

4

Output Level

40

dBmV

5

Output QAM Mode

256B

6

Output QAM Map

STD

7

Output QAM Data Rate

5.3605

Mbaud

8

Output QAM Interleaver

128-1

9

Output QAM Alpha

12%

10

QAM Lock State

Lock

Save

Figure 5.5.3 - “Main > Output> Qam” Screen

- 1 **Output Channel/Frequency:** user must assign a RF channel number to the RF QAM output of the Quad-QAM module (i.e. RF channel 50, as shown in Figure 5.5.2). The remaining three RF QAM channels will be automatically assigned to the next adjacent channels (i.e. RF channels 51, 52, and 53). The range is NTSC channels 2 to 155.



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

- 2 **Output Control:** turns each of the 4 RF channels 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 frequency alignment of the system.
- 4 **Output Level:** must select the QAM RF output level for the output. The range is 35 to 45 dBmV. It is recommended to maintain the output level at 40 dBmV for normal operation.
- 5 **Output QAM Mode:** allows user to 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:** allows user to select the desired QAM Map (channel/frequency plan). 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 5.360500 Mbaud for QAM 256B.
- 8 **Output QAM Interleaver:** indicates the interleaver value for the selected QAM mode.
- 9 **Output QAM Alpha:** indicates the Alpha value for the selected QAM mode.
- 10 **QAM Lock State:** indicates whether Quad-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.

5.6 "Main > Refresh" Tab

The “Main > Refresh” tab can be clicked while you are on any of the following sub-tabs screens: “Status”, “Inputs”, “Encoder”, and “Output”. When clicked, it will update all relevant fields/parameters of the active screen as that information is retrieved from the HDE-8C-QAM/IP in a real-time basis.

5.7 "Network" Screen

The “Network” screen (Figure 5.7) is a user-configurable screen where the following parameters are displayed or configured:

HDE-8C-QAM

ESN: 2013000000 Temperature: 114.5°F Uptime: 0d 0h 6m 11s
Headend Name: Test Location: BT

Main

Network

Time

Event Log

Update

Logout

1

Control Port MAC Address:

00:14:39:00:34:F5

2

Receivers Control Port MAC Address:

00:14:39:00:34:F6

3

Software Version:

1.0.2

4

FPGA1 Version:

1.0

5

FPGA2 Version:

1.0

6

FPGA3 Version:

1.0

7

FPGA4 Version:

1.0

8

FPGA5 Version:

1.0

9

Hardware Version:

0

10

Serial Number:

B

11

Headend Name:

12

Location:

13

Login Timeout (Minutes):

15

14

Control Port IP Address:

172.16.70.1

15

Control Port Subnet Mask:

255.255.255.0

16

Control Port Default Gateway:

172.16.70.254

17

Receivers Control Port IP Address:

192.168.253.1

18

Receivers Control Port Subnet Mask:

255.255.255.0

19

Receivers Control Port Default Gateway:

192.168.253.254

20

Event Log Destination:

172.16.70.10

21

Log Destination Port #:

514

Save

Figure 5.7 – “Network” Screen

- 1 **Control Port MAC Address:** indicates the MAC Address of the “Control 10/100” Port.
- 2 **Receivers Control Port MAC Address:** indicates the MAC Address of the “Receivers Control 10/100” Port.
- 3 **Software Version:** indicates the software version of the unit.
- 4 **FPGA1 Version:** indicates the current hardware version of the unit’s FPGA1 chipset.
- 5 **FPGA2 Version:** indicates the current hardware version of the unit’s FPGA2 chipset.
- 6 **FPGA3 Version:** indicates the current hardware version of the unit’s FPGA3 chipset.
- 7 **FPGA4 Version:** indicates the current hardware version of the unit’s FPGA4 chipset.
- 8 **FPGA5 Version:** indicates the current hardware version of the unit’s FPGA5 chipset.
- 9 **Hardware Version:** indicates the unit’s hardware version.
- 10 **Serial Number:** indicates the unit’s serial number.
- 11 **Headend Name:** a user-defined field to make identification easier.
- 12 **Location:** a user-defined field to make identification easier.
- 13 **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.
- 14 **Control Port IP Address:** see 11 of Section 5.7.1 for details.
- 15 **Control Port Subnet Mask:** see 12 of Section 5.7.1 for details.
- 16 **Control Port Default Gateway:** see 13 of Section 5.7.1 for details.
- 17 **Receivers Control Port IP Address (FUTURE OPTION):** see 14 of Section 5.7.1 for details.
- 18 **Receivers Control Port Subnet Mask (FUTURE OPTION):** see 15 of Section 5.7.1 for details.
- 19 **Receivers Control Port Default Gateway (FUTURE OPTION):** see 16 of Section 5.7.1 for details.
- 20 **Event Log Destination:** see 17 of Section 5.7.1 for details.
- 21 **Log Destination Port #:** see 18 of Section 5.7.1 for details.

5.7.1 "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 5.7.1 by typing the URL of the unit followed by a forward slash and Admin.html, for example: http://172.16.70.1/Admin.html.

HDE-8C-QAM

ESN: 2013000000 Temperature: 114.5°F Uptime: 0d 0h 6m 11s
Headend Name: Test Location: BT

[Main](#) | [Network](#) | [Time](#) | [Event Log](#) | [Update](#) | [Logout](#)

Control Port MAC Address:	00:14:39:00:34:F5
Receivers Control Port MAC Address:	00:14:39:00:34:F6
Software Version:	1.0.2
FPGA1 Version:	1.0
FPGA2 Version:	1.0
FPGA3 Version:	1.0
FPGA4 Version:	1.0
FPGA5 Version:	1.0
Hardware Version:	1
Serial Number:	2013080211

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

Login:

Current Password:

New Password:

Confirm New Password:

Guest Login:

Current Guest Password:

New Guest Password:

Confirm Guest Password:

System Watchdog: Enabled ▼

System Reboot: Reboot Unit

Control Port IP Address:	<input style="width: 95%;" type="text" value="172.16.70.1"/>
Control Port Subnet Mask:	<input style="width: 95%;" type="text" value="255.255.255.0"/>
Control Port Default Gateway:	<input style="width: 95%;" type="text" value="172.16.70.254"/>
Receivers Control Port IP Address:	<input style="width: 95%;" type="text" value="192.168.253.1"/>
Receivers Control Port Subnet Mask:	<input style="width: 95%;" type="text" value="255.255.255.0"/>
Receivers Control Port Default Gateway:	<input style="width: 95%;" type="text" value="192.168.253.254"/>
Event Log Destination:	<input style="width: 95%;" type="text" value="172.16.70.10"/>
Log Destination Port #:	<input style="width: 95%;" type="text" value="514"/>
Time Server IP:	<input style="width: 95%;" type="text" value="172.16.70.10"/>

Syslog Errors: ☐ Enabled ☒ Disabled

Syslog Informational: ☐ Enabled ☒ Disabled

Syslog Feedback: ☐ Enabled ☒ Disabled

Active Users:

Admin	172.16.70.100
none	0.0.0.0
none	0.0.0.0
none	0.0.0.0
none	0.0.0.0

Save

Figure 5.7.1 – "Admin.html" 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". The 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:** user 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". The 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:** user 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 **System Watchdog:** when Enabled, automatically reboots the unit, if the operating system stops working or the status LED turns status green or off. When Disabled, manual reboot is required in case of above events. Possible options are Enabled and Disabled.
- 10 **System Reboot:** allows the user to remotely reboot the unit.
- 11 **Control Port IP Address:** is the static IP address that is assigned to the Control 10/100 Port. It allows the user to access the unit via the web interface. The factory default IP address is 172.16.70.1.
- 12 **Control Port Subnet Mask:** is the Subnet Mask assigned to the Control Port of the unit. It allows the user to determine which subnet the Control Port IP address belongs to. The factory default Subnet Mask is 255.255.255.0.
- 13 **Control Port Default Gateway:** is the gateway address assigned to the Control Port. It allows the user to access the unit from another network via the web interface. The factory default Default Gateway is 172.16.70.254.
- 14 **Receivers Control Port IP Address (FUTURE OPTION):** is the static IP address that is assigned to the Receivers Control 10/100 Port. It allows the user to remotely monitor and control up to nine select satellite receivers through UPnP protocol via the web interface. The factory default IP address is 192.168.253.1.
- 15 **Receivers Control Port Subnet Mask (FUTURE OPTION):** is the Subnet Mask assigned to the Receivers Control Port. It allows the user to determine which subnet the Receivers Control Port IP address belongs to. The factory default Subnet Mask is 255.255.255.0.
- 16 **Receivers Control Port Default Gateway (FUTURE OPTION):** is the gateway address assigned to the Receivers Control Port. It allows the user to access select satellite receivers from another network via the web interface. The factory default, Default Gateway is 192.168.253.254.
- 17 **Event Log Destination:** is the IP address of the remote server, to which Syslog sends the activities recorded by HDE-8C-QAM for monitoring and troubleshooting purposes. The factory default value is 172.16.70.2.
- 18 **Log Destination Port #:** is the Event 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 5.8 for details). The factory default value is 172.16.70.2.
- 20 **Syslog Errors:** enable/disables the HDE-8C-QAM/IP to forward error messages (in red font) to an SNMP syslog. The factory default value is disabled.
- 21 **Syslog Informational:** enable/disables the HDE-8C-QAM/IP to forward information messages (in blue font) to an SNMP syslog. The factory default value is disabled.
- 22 **Syslog Feedback:** enable/disables the HDE-8C-QAM/IP to forward feedback or confirmation messages (in green font) to an SNMP syslog. The factory default value is disabled.
- 23 **Active Users:** indicates the username and IP address of the currently logged in users.



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

5.8 "Time" Screen

The "Time" screen (Figure 5.11) allows you to set the current date and time for the HDE-8C-QAM/IP. 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 "Automatic" option which allows the unit to automatically acquire time settings from a "Time Server" - you must enter the IP address of the time server (see 19 of Section 5.7.1 for details).

HDE-8C-QAM			
ESN: 2013000000		Temperature: 114.5°F	
Headend Name: Test		Uptime: 0d 0h 6m 11s	
		Location: BT	
Main	Network	Time	Event Log
Update	Logout		

1 Time Adjustments

Local Time Zone: UTC -12:00

GPS Leap Seconds: 16 Seconds

[Apply Time Adjustments](#)

2 Daylight Saving Time

DST Adjustment: Off

DST Start - Local Date and Time: March / 10 / 2013 2:00

DST End - Local Date and Time: November / 3 / 2013 2:00

[Apply Daylight Saving Time](#)

3 NTP Server

NTP Server IP Address: 172.16.70.10

[Acquire NTP Time Now](#)

4 Set Date & Time

Current Local Time: Fri Sep 27 2013 15:18:12

Current UTC Time: Sat Sep 28 2013 03:18:12

Time Keeping Method: Manual

Local Date Setting: September / 27 / 2013

Local Time Setting: 15 : 18 : 12

[Apply Date and Time Settings](#)

[Apply All Time Settings](#)

Figure 5.8 - "Time" Screen

- 1 In the section entitled "**Time Adjustments**", the local time zone on Coordinated Universal Time (UTC) can be set.
- 2 In the section entitled "**Daylight Saving Time**", the user can apply the Daylight Savings 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 NPT server to acquire the time directly from NTP Server when an internet connection is available (see 19 of Section 5.7.1 for details).
- 4 In the section entitled "**Set Date & Time**", the user can manually enter the date and time.

5.9 "Event Log" Screen

The “Event Log” screen (Figure 5.9) is a “read and write” screen where the following parameters can be displayed or configured. The data in Error Log can be forwarded to a SysLog database – (see 20 , 21 , 22 & of Section 5.7.1 for details). The lines are color coded as follows:

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

HDE-8C-QAM

ESN: 2013000000 Temperature: 114.5°F Uptime: 0d 0h 6m 11s
Headend Name: Test Location: BT

Main

Network

Time

Event Log

Update

Logout

1

Event Log Destination: 172.16.70.10

2

Log Destination Port #: 514

3

Clear Log

4

Lines to Display:

25

5

Save Number of Displayed Lines

Thu Sep 26 20:07:53 2013 : Input 8 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 7 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 6 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 5 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 4 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 3 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 2 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Input 1 status has changed: Locked=1, Resolution=1080i.

Thu Sep 26 20:07:53 2013 : Power Up Started

Figure 5.9 - "Event Log" Screen

- 1 **Event Log Destination:** see 17 of Section 5.7.1 for details.
- 2 **Log Destination Port #:** see 18 of Section 5.7.1 for details.
- 3 **Clear Log:** allows the user 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.

5.10 "Update" Screen

The "Update" screen (Figure 5.10) allows user to browse, select, and download/update the Config file.

Figure 5.10 "Update" Screen

- 1 **Choose File:** allows the user to select a desired configuration file to be uploaded to the unit from any location on the computer.
- 2 **Update:** allows the user to upload the selected configuration file to the unit.
- 3 **Download Configuration File:** allows the user to download & save the current configuration settings of the unit.

Appendix A: Updating the Software Remotely

General background:

There are two different PROMs that need to be programmed in HDE-8C-QAM/IP. They are called PROM1 and PROM2. Please note not every software update requires both PROMs to be programmed. However, program both PROMs unless you get a written notice with Release notes to do otherwise.

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

Step 1: FTP two files from your PC to HDE-8C-QAM/IP.

Step 2: a) Update PROM1 with the specific command line.

b) Update PROM2 with the specific command line.

Step 1: FTP two Files to HDE-8C-QAM/IP:

FTP both files (EPCS_1_ver#.bin and EPCS_2_ver#.bin) into the HDE-8C-QAM/IP server board (there are many ways to do this).

NOTE: a) The EPCS_1_ver#.bin is to program PROM1 and EPCS_2_ver#.bin is to program PROM2.

b) All the commands are case sensitive

c) It is recommended to copy the EPCS_1_ver#.bin and EPCS_2_ver#.bin files in the root directory. i.e, My Computer > C:

d) Only entering the command prompt, if you see a directory different than the root directory as shown in Figure 1, then use the command "cd.." to enter the C:\>.

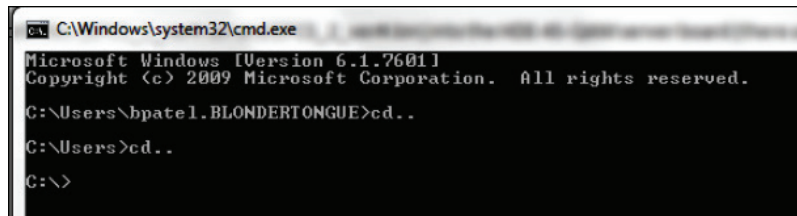


Figure 1

From a command (DOS) prompt (you must be in the same folder as the EPCS files) 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 files as binary files.}

bin

put EPCS_1_ver#.bin

put EPCS_2_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-8C-QAM/IP:

There are two ways to telnet to the HDE-8C-QAM/IP:

- (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.

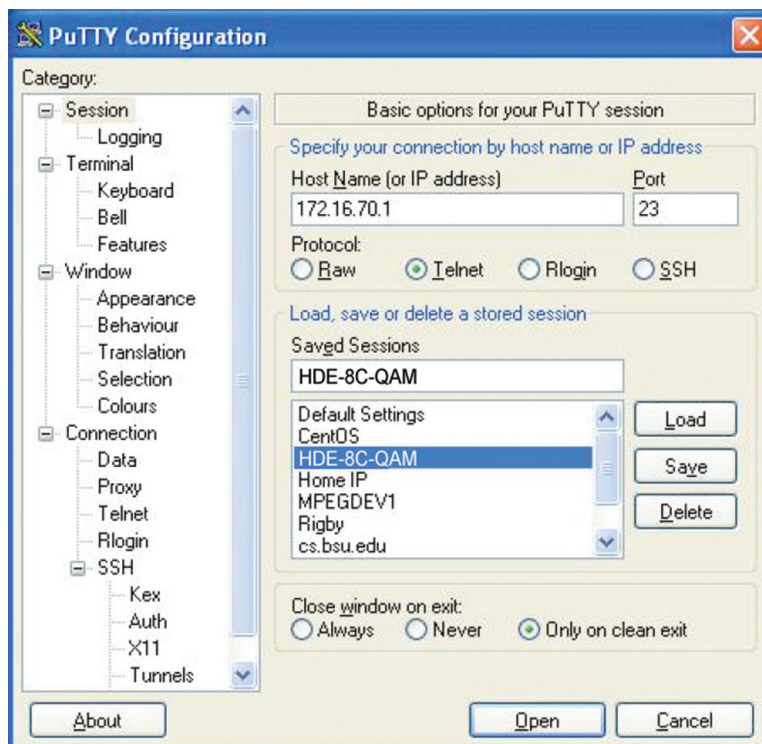


Figure 5.14

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_x.bin files have been placed.

cd home/ftp

ls

Step 2: Update PROM1 and/or PROM2:

Now you can use the field update utility (epcs) to program the EPCS PROMs. This is a custom utility that resides in HDE-8C-QAM/IP.

Warning: Care should be taken at this time, if miss spelled characters or letters are typed by accident, or you have missed to type the bin command in Step 1, this could cause the HDE-8C-QAM/IP Flash memory to be corrupted. The HDE-8C-QAM/IP will try to reload the OS using the corrupted file ten (10) times before it displays the following screen (Figure 5.15). You can recover from this situation by repeating the procedure all over again from Step 1 above.

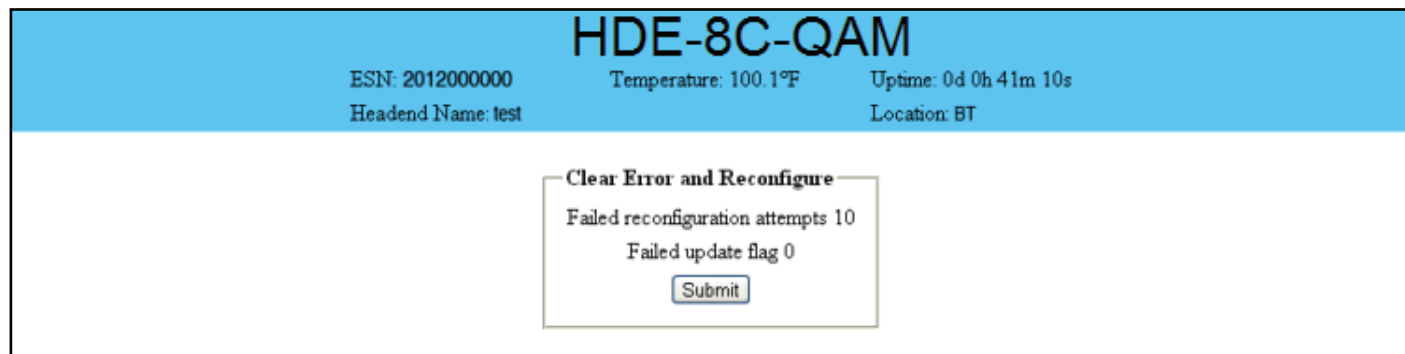


Figure 5.15

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

Update FPGA1 by programming EPCS1:

epcs -e1 EPCS_1_ver#.bin

Update FPGA2 by programming EPCS2: (if necessary)

epcs -e2 EPCS_2_ver#.bin

NOTE: If you get errors during programming then DO NOT TURN OFF THE HDE-8C-QAM/IP, just repeat the epcs commands again.

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

Two choices to reset the HDE-8C-QAM/IP:

- (1) Reset switch in the back of the unit.
- (2) Use Telnet and type "**epcs -c**" this will automatically reboot the HDE-8C-QAM/IP without a need for resetting with power switch.

NOTE: The boot-up process for HDE-8C-QAM/IP is approximately 30 seconds.

NOTES:

NOTES:

NOTES:

Extended Warranty Program

STANDARD TERMS & CONDITIONS OF THE EXTENDED WARRANTY

A. THE EXTENDED WARRANTY AGREEMENT (EWA)

If during the period following the expiration of the Blonder Tongue Manufacturers' Standard Warranty (Copy Included) the products which constitute the subject matter of the extended warranty, manifest any manufacturing or similar such defects then Blonder Tongue shall at its option repair or replace the product. It is emphasized that the extended warranty is in effect an extension of the Blonder Tongue Warranty and covers the items stipulated in Paragraph B to the exclusion of the terms in Paragraph C of this agreement. Eligibility to purchase EW is limited to 90 days following initial shipment on selected products of sufficient value.

The product/products included in this extended warranty agreement are listed in the invoice that accompanies the EWA. Term of the extension will be _____ year(s). Purchase Order is required for extended warranty coverage.

B. WHAT IS COVERED?

1. If a product has been determined to have failed, which falls within the Terms & Conditions of this EWA, Blonder Tongue Inc. may at its sole discretion repair, modify or replace its component parts that are defective at 100% coverage for parts and labor.
2. A loaner unit may be available on request; PO required.
3. Product is manufactured by Blonder Tongue.
4. Extended warranty period is up to and not to exceed 24 months and sold in increments of 12 months. Order # 9981 for 1 year and #9982 for 2 year extensions.
5. Return of repair or replaced product shipping costs for ground shipments.
6. Firmware upgrades at no charge with automatic notification.

C. WHAT IS NOT COVERED?

1. The warranty does not cover any defects caused by foreign objects /connection errors .
2. Use other than by the customer at the declared address appearing in this document.
3. Failure by the end user to comply with the manufacturers' instructions for installation, maintenance or use.
4. The use of accessories which have not been approved by Blonder Tongue.
5. The application and/or use of any incorrect or abnormal electrical supply to the product.
6. Any defect in wiring or electrical connections which does not form part of the product at the time of the original purchase.
7. Neglect, misuse, or willful abuse of the product.
8. Any repairs or attempted repairs of the product by any person other than Blonder Tongue Service Department.
9. Any modification of the product by any person other than Blonder Tongue Service Department.
10. Fire, flood, war, civil disturbance, industrial action, acts of God or any other causes beyond the reasonable control of Blonder Tongue.
11. Any defect caused by lightning strike or power surges.
12. Shipping costs to return products to Blonder Tongue for warranty service.
13. Blonder Tongue will not in any circumstances be liable for any consequential loss or damages suffered by the customer whether directly or indirectly related defect in the product to the extent permissible by law.
14. Repairs may not be effected without prior authorization from Blonder Tongue Laboratories.

D. GENERAL

1. The customer shall notify Blonder Tongue Laboratories in writing within ten days of any change of his or her address.
2. Customer must provide original **purchase receipt** and **serial number** to initiate extended warranty coverage.
3. The fee paid for the warranty is not refundable under any circumstances unless cancelled within seven days of purchase.
4. The customer shall take all reasonable precautions to maintain the product is maintained in good working order.
5. The warranty contract ceases to exist if the product is replaced or a credit is given to the customer. Any monies paid for the warranty contract are forfeited and not refundable. This is only applicable when the product is out of the manufacturer's warranty.
6. The extended warranty period as stated on the Extended Warranty Agreement shall be the governing period notwithstanding any additional supplier warranty on specific components.
7. The warranty shall in no way effect the terms and conditions of the sale agreement in terms of which the customer bought the product.
8. The extended warranty is limited to the terms and conditions herein contained
9. No agreement, varying, adding to, amended, deleting, or cancelling this warranty shall be effective unless given in writing (email is acceptable) and signed by or on behalf of both parties.
10. The cost of the extended warranty is 8% of the purchase price for a 1 or 2 year extension beyond the Blonder Tongue standard warranty. e.g. A product price of \$1000 will be \$80 for the 1st year (12 mos) and additional \$80 for 2 year (24 mos) extension for a total of \$160.
11. Warranty product return postage paid to: Blonder Tongue Laboratories, Inc.

Attn: Warranty Service Dept.
1 Jake Brown Road
Old Bridge, NJ 08857

Contact Blonder Tongue at 800-523-6049 ext. 555 to order extended warranty service.

Limited Warranty

Seller will at its sole option, either repair or replace (with a new or factory reconditioned product, as Seller may determine) any product manufactured or sold (or in the case of software, licensed) by Seller which is defective in materials or workmanship or fails to meet the applicable specifications that are in effect on the date of shipment or such other specifications as may have been expressly agreed upon in writing: (i) for a period of three (3) years from the date of original purchase for all stock hardware products (other than those specifically referenced herein below having a shorter warranty period); (ii) for a period of one (1) year from the date of original purchase, with respect to all MegaPort™, IPTV products, test equipment and fiber optics receivers, transmitters, couplers and integrated receiver/distribution amplifiers; (iii) for a period of one (1) year from the date of original purchase (or such shorter period of time as may be set forth in the license agreement specific to the particular software being licensed from Seller) with respect to all software products licensed from Seller (other than Core Product Software) that is (a) developed for a specific function or application, (b) complimentary to and does not function without the Core Product Software, and (c) listed with a specific model number and stock number in Seller's Price List ("**Non-Core Software**"); (iv) for a period of ninety (90) days from the date of original purchase, with respect to non-serialized products and accessories, such as parts, sub-assemblies, splitters and all other products sold by Seller (other than Core Product Software and Refurbished/Closeout Products) not otherwise referred to in clauses (i) through (iii) above. The warranty period for computer programs in machine-readable form included in a hardware product, which are essential for the functionality thereof as specifically stated in the published product specifications ("**Core Product Software**") will be coincident with the warranty period of the applicable hardware product within which such Core Product Software is installed.

Software patches, bug fixes, updates or workarounds do not extend the original warranty period of any Core Product Software or Non-Core Software.

Notwithstanding anything herein to the contrary,

(i) Seller's sole obligation for software that when properly installed and used does not substantially conform to the published specifications in effect when the software is first shipped by Seller, is to use commercially reasonable efforts to correct any reproducible material non-conformity (as determined by Seller in its sole discretion) by providing the customer with: (a) telephone or e-mail access to report non-conformance so that Seller can verify reproducibility, (b) a software patch or bug fix, if available or a workaround to bypass the issue if available, and (c) where applicable, replacement or damaged or defective external media, such as CD-ROM disk, on which the software was originally delivered;

(ii) Seller does not warrant that the use of any software will be uninterrupted, error-free, free of security vulnerabilities or that the software will meet the customer's particular requirements; and the customer's sole and exclusive remedy for breach of this warranty is, at Seller's option, to receive (a) suitably modified software, or part thereof, or (b) comparable replacement software or part thereof;

(iii) Seller retains all right, title and interest in and to and ownership of all software (including all Core Product Software and Non-Core Software) including any and all enhancements, modifications and updates to the same; and

(iv) in some cases, the warranty on certain proprietary sub-assembly modules manufactured by third-party vendors and contained in Seller's products, third party software installed in certain of Seller's products, and on certain private-label products manufactured by third-parties for resale by Seller, will be of shorter duration or otherwise more limited than the standard Seller limited warranty. In such cases, Seller's warranty with respect to such third-party proprietary sub-assembly modules, third-party software and private-label products will be limited to the duration and other terms of such third-party vendor's warranty, if any. In addition, certain products, that are not manufactured by Seller, but are resold by Seller, may carry the original OEM warranty for such products, if any. The limited warranty set forth above does not apply to any product sold by Seller, which at the time of sale constituted a Refurbished/Closeout Product, the limited warranty for which is provided in the following paragraph.

Seller will at its sole option, either repair or replace (with a new or factory-reconditioned product, as Seller may determine) any product sold by Seller which at the time of sale constituted a refurbished or closeout item ("**Refurbished/Closeout Product**"), which is defective in materials or workmanship or fails to meet the applicable specifications that are in effect on the date of shipment of that product or fails to meet such other specifications as may have been expressly agreed upon in writing between the parties, for a period of ninety (90) days from the date of original purchase. Notwithstanding the foregoing, in some cases the warranty on certain proprietary sub-assembly modules manufactured by third-party vendors and contained in Seller products, third party software installed in certain of Seller's products, and on certain private-label products manufactured by third-parties for resale by Seller will be of shorter duration or otherwise more limited than Seller limited warranty for Refurbished/Closeout Products. In such cases, Seller's warranty for Refurbished/Closeout Products constituting such third party proprietary sub-assembly modules, third party software, and private-label products will be limited to the duration and other terms of such third-party vendor's warranty, if any. In addition, notwithstanding the foregoing, (i) certain Refurbished/Closeout Products that are not manufactured (but are resold) by Seller, may carry the original OEM warranty for such products, if any, which may be longer or shorter than Seller's limited warranty for Refurbished/Closeout Products. All sales of Refurbished/Closeout Products are final.

To obtain service under this warranty, the defective product, together with a copy of the sales receipt, serial number if applicable, or other satisfactory proof of purchase and a brief description of the defect, must be shipped freight prepaid to Seller at the following address: One Jake Brown Road, Old Bridge, New Jersey 08857.

This warranty does not cover failure of performance or damage resulting from (i) use or installation other than in strict accordance with manufacturer's written instructions, (ii) disassembly or repair by someone other than the manufacturer or a manufacturer-authorized repair center, (iii) misuse, misapplication or abuse, (iv) alteration, (v) exposure to unusual physical or electrical stress, abuse or accident or forces or exposure beyond normal use within specified operational or environmental parameters set forth in applicable product specifications, (vi) lack of reasonable care or (vii) wind, ice, snow, rain, lightning, or any other weather conditions or acts of God.

OTHER THAN THE WARRANTIES SET FORTH ABOVE, SELLER MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND, EXPRESS OR IMPLIED, AS TO THE CONDITION, DESCRIPTION, FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR AS TO ANY OTHER MATTER, AND SUCH WARRANTIES SET FORTH ABOVE SUPERSEDE ANY ORAL OR WRITTEN WARRANTIES OR REPRESENTATIONS MADE OR IMPLIED BY SELLER OR BY ANY OF SELLER'S EMPLOYEES OR REPRESENTATIVES, OR IN ANY OF SELLER'S BROCHURES MANUALS, CATALOGS, LITERATURE OR OTHER MATERIALS. IN ALL CASES, BUYER'S SOLE AND EXCLUSIVE REMEDY AND SELLER'S SOLE OBLIGATION FOR ANY BREACH OF THE WARRANTIES CONTAINED HEREIN SHALL BE LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT F.O.B. SHIPPING POINT, AS SELLER IN ITS SOLE DISCRETION SHALL DETERMINE. SELLER SHALL IN NO EVENT AND UNDER NO CIRCUMSTANCES BE LIABLE OR RESPONSIBLE FOR ANY CONSEQUENTIAL, INDIRECT, INCIDENTAL, PUNITIVE, DIRECT OR SPECIAL DAMAGES BASED UPON BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, STRICT TORT LIABILITY OR OTHERWISE OR ANY OTHER LEGAL THEORY, ARISING DIRECTLY OR INDIRECTLY FROM THE SALE, USE, INSTALLATION OR FAILURE OF ANY PRODUCT ACQUIRED BY BUYER FROM SELLER.

All claims for shortages, defects, and non-conforming goods must be made by the customer in writing within five (5) days of receipt of merchandise, which writing shall state with particularity all material facts concerning the claim then known to the customer. Upon any such claim, the customer shall hold the goods complained of intact and duly protected, for a period of up to sixty (60) days. Upon the request of Seller, the customer shall ship such allegedly non-conforming or defective goods, freight prepaid to Seller for examination by Seller's inspection department and verification of the defect. Seller, at its option, will either repair, replace or issue a credit for products determined to be defective. Seller's liability and responsibility for defective products is specifically limited to the defective item or to credit towards the original billing. All such replacements by Seller shall be made free of charge f.o.b. the delivery point called for in the original order. Products for which replacement has been made under the provisions of this clause shall become the property of Seller. Under no circumstances are products to be returned to Seller without Seller's prior written authorization. Seller reserves the right to scrap any unauthorized returns on a no-credit basis. Any actions for breach of a contract of sale between Seller and a customer must be commenced by the customer within thirteen (13) months after the cause of action has accrued. A copy of Seller's standard terms and conditions of sale, including the limited warranty, is available from Seller upon request. Copies of the limited warranties covering third-party proprietary sub-assembly modules and private-label products manufactured by third-parties may also be available from Seller on request. (Rev 0713)



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