



SOLUTIONS FOR ALL YOUR APPLICATIONS

Stock No.
6281
USER MANUAL

8VSB/QAM Transcoder

AQT8-QAM/IP

8x8VSB/QAM to QAM/IP

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www.blondertongue.com

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

Purchase Location Name:	
Purchase Location Telephone Number:	
AQT8-QAM/IP Serial Number:	

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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

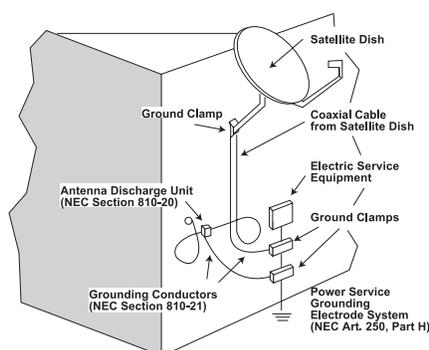


**YOU SHOULD ALWAYS FOLLOW THESE INSTRUCTIONS TO HELP ENSURE
AGAINST INJURY TO YOURSELF AND DAMAGE TO YOUR EQUIPMENT.**

- 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.
- 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.

Safety Instructions - continued

- 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.

AQT8 Series Model Comparison

Stock #	Model	Input	QAM Output	IP Output
6280	AQT8-IP	8VSB or clear QAM	Not Applicable	Customizable IP Output <ul style="list-style-type: none"> • 8 IP outputs with EAS • Program selectable from input • 20 programs max • PSIP Manipulation
6281	AQT8-QAM/IP	8VSB or clear QAM	<ul style="list-style-type: none"> • Selectable 8 QAM Outputs (Default IP Mode with EAS*) • Pass-through Mode Output (Default RF mode w/o EAS and no program selection) • PSIP Manipulation 	Customizable IP Output <ul style="list-style-type: none"> • 8 IP outputs with EAS* • Program selectable from input • 20 programs max • PSIP Manipulation
6288	AQT8-QAM	8VSB or clear/encrypted QAM	Pass-Thru Mode Output <ul style="list-style-type: none"> • 8 QAM outputs with EAS* • No program selection • One input maps to one output 	Pass-Thru IP Output <ul style="list-style-type: none"> • 8 IP outputs with EAS* • No program selection • One input maps to one TS

* EAS stream will replace the input stream (clear or scrambled) and will remain unchanged. For example, if a clear EAS stream replaces a scrambled input stream - the output will be a clear EAS stream.

Section 2 — Product Summary

2.1 Revision History & Reason

Issue 5: Manual adds changes in unit operation when paired with BT Dashboard on firmware v1.0.10. Also added are more caution notes regarding the IP output's 20 program limit.

Issue 4: Manual added the capability for the QAM outputs to follow the IP streams or RF inputs (RF default mode) using firmware v1.0.8 or above. See section 6.8 #5 for more details.

Issue 3: Manual removed the Event Log IP address and Port number display from the EAS webpage.

Issue 2: Manual added the SNR Threshold table in Section 6.2.

Issue 1: New Instruction Manual for AQT8-QAM/IP.

2.2 Product Application & Description

Application:

AQT8-QAM/IP Transcoder allows the user to create a line up from off-air and/or cable feeds for coax or IP distribution. The unit simultaneously transcodes up to eight (8) QAM/8VSB input channels to QAM (up to 8) and IP (up to 8) transport streams. When the QAM output selection is "Default RF" (Section 6.8, #5), the pass thru QAM outputs contain all programs (major and minor channels) residing in their respective input channel sources. The following MPEG-2 tables are maintained: PAT; PMT; PSIP; VCT; EIT and ETT. Alternately if "IP Default" or "IP#" output is selected, the QAM output will contain all programs (major and minor channels) and tables residing in the source IP stream.

The customizable IP output contains up to 20 programs with a combination of SPTS and/or MPTS across eight (8) IP addresses. MPEG-2 tables associated with each of the selected input programs (PAT, PMT, PSIP, VCT and MGT) are transferred to the IP outputs. This means the virtual channel numbers and program names on the IP outputs can be the same as their RF program input sources and the QAM output. Additionally, the AQT8 gives the user the ability to change the PID, Program #, Short Name, Major Ch., and Minor Ch. information to provide a customized IP or coax cable delivery solution.

The **AQT8-QAM/IP** features Emergency Alert System (EAS) program switching through either an ASI or IP format EAS input and terminal block contacts for triggering. EAS messaging is available on the IP and QAM outputs when the QAM Output Mode is set to "Default IP" or "IP#". There will be no EAS messaging on the QAM output channels when in the "RF Default" mode.

Features:

- Accepts up to 8 RF inputs in 8VSB/QAM format
- Supports up to 20 programs on each input and 20 programs (total) on the 8 IP outputs
- Supports in-service monitoring of a selected input and output
 - An IP output can be sent to the front panel ASI for in-service monitoring of a selected output
 - A -20 dB QAM RF test connector is provided on the front panel to monitor the units output
- PSIP manipulation
- Performs IP network de-jitter, PCR (Program Clock Reference) replacement, null packet insertion and deletion
- Supports RTP/UDP -and- ARP, IGMPv2, ICMP protocols
- Supports ARP, IGMPv2, and ICMP protocols
- Supports EAS switching-based on contact closure trigger or +5 to +12 VDC input
- Provides comprehensive GUI-based remote monitoring and control via any standard Web browser

Important Operational Information:

1. There are no STT tables on the IP output.
2. There will be no CVCT/TVCT if the output TS has more than 3 programs.
3. Each input has a maximum of 20 programs.
4. The maximum total number of output programs is 20.

2.2 Product Application & Description (Continued)

Description:

Following are pictures of the front and rear of the unit:



- 1 **-20dB QAM RF TEST:** "F" female connector for RF QAM output signal, 20dB lower than the actual RF QAM output. Used for test purposes, without taking the unit out of service.
- 2 **ASI OUT:** For in-service monitoring of selected IP output
- 3 **Input STATUS LEDs # 1 through 8:**
 - LED is Off = input channel tuner not locked.
 - LED is Green = input channel tuner is locked.
 - LED is RED = error detected in input stream.
 - LED blinks = corresponding QAM output is off or in CW mode
- 4 **POWER LED:** If the LED is Green, the AC power is detected. If the LED is Off, it will indicate one of the following:
 - (i) AC power is not connected, or
 - (ii) AC power is connected but the power supply is defective. Unit must be sent to factory for repairs.
- 5 **DATA OUT (GIGE):** RJ45 for 1000Base-T Ethernet (GigE) interface for IP DATA outputs.
- 6 **CONTROL (10/100):** RJ45 connector for 10/100Base-T Ethernet interface for monitoring and configuring the unit via standard web browser. Only static IP address can be assigned to this interface. (Factory Default: "172.16.70.1")
- 7 **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)

NOTE: Power must be reset for this to take effect

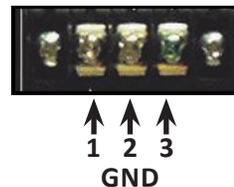
2.2 Product Application & Description (Continued)



8 INPUT POWER ASSEMBLY AND FUSE: IEC 14 power inlet plug – rated 110-230 VAC; 0.7/0.35; 60/50 Hz; equipped with Slo-Blo, 3.0A, 250 V Fuse.

9 EAS TRIGGER CONTACTS: Terminal strip will activate the EAS messaging feature in the following ways:

- 5-12 VDC between terminals 1 & 3 shown to the right.
- Dry Contact between terminals 2 & 3 shown to the right.



NOTE: This feature activates EAS and overrides all the input programs with the EAS INPUT (see 10 and 11 below for details). When in "RF Default" mode, the EAS program substitution is for IP outputs only. EAS messaging is available on the IP and QAM outputs when the QAM Output Mode is set to "Default IP" or "IP#". There will be no EAS messaging on the QAM output channels when in the "RF Default" mode.

10 EAS ASI IN: SPTS EAS input stream.

11 EAS 10/100 IP EAS INPUT: SPTS EAS IP input.



It is recommended that EAS ASI or IP inputs should be SD with a TS bit rate of 2.5 Mbps (typical). Higher EAS TS bit rates can be used but they should not exceed the lowest bit rate program in all IP outputs.

12 QAM Output: "F" female connector for QAM RF output. The unit is configured with 2 output modules; each module provides 4 adjacent QAM RF channels (24MHz-wide). The RF outputs of both modules are combined internally and presented on this QAM output connector.

13 8VSB/QAM Inputs: These are the 8 RF inputs.

2.3 Product Specifications

Input

Connectors	8VSB/QAM: 8x "F" Female
8VSB Mode	Standard: ATSC Digital Television A/53E Tuning Range: VHF (Ch. 2-13), UHF (Ch. 14-69) Data Rate: 19.392 Mbps Bandwidth: 6 MHz Power Level: -20 to +20 dBmV Impedance: 75 Ω
QAM Mode	Standard: ITU-T J.83 - Annex A & B (64 and 256 QAM) Tuning Range: CATV Ch. 2-135 (STD, HRC, IRC) Data Rate: 38.8 Mbps (QAM 256); 26.97 Mbps (QAM 64) – Auto Detect Bandwidth: 6 MHz Power Level: -15 to 20 dBmV (@ QAM 256) -20 to 20 dBmV (@ QAM 64) Impedance: 75 Ω
Emergency Alert System	
ASI	Connector: 1x BNC Female Standard: DVB-ASI; EN 50083-9 (SPTS)
IP	Connector: 1x RJ45 Standard: 10/100Base-T UDP/RTP: Supported (user-selectable) Video Bit Rate: Single program video bit rate of 2.5 Mbps (typical). The EAS program bit rate must not exceed the lowest program video bit rate it will replace. For example, EAS at 2.5 Mbps will not work for a program at 2.0 Mbps.
Trigger	Connectors: Terminal Block Trigger Mechanism: 5-12 VDC & Dry Contact Closure

General

Dimensions (W x D x H):	19.0 x 16.0 x 1.75 inches (483 x 363 x 44 mm)
Power:	110 /230 VAC 60/50 Hz
Power Dissipation:	70 W
Weight:	12 lbs (5.5 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-condensation
Storage Humidity:	0 to 95% RH @ 35 °C max, non-condensation

Output

IP:	Connectors: 1x RJ45 (Rear-panel) Standard: 1000Base-T Ethernet (GigE) UDP/RTP: Supported (user-selectable) Address Assignment: 8x IPv4 addresses & port numbers (user-selectable)
QAM	No. of Output Modules: 2 Quad-QAM Connector: 1x "F" Female (rear-panel; for combined outputs) 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: 2x 24 MHz (4x Adjacent 6MHz) No. of Programs: Variable (not to exceed 38.8 Mbps) RF Level: +40 dBmV, ± 1 dB increment RF Level Adjustment Range: +35 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 (@ +35 dBmV output level, 5.5 MHz bandwidth) Impedance: 75 Ω QAM Spectrum: Inverted 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 Female Standard: DVB-ASI; EN 50083-9

Alarms/Monitoring/Control

Local Monitoring:	8 Channel LEDs 1x Power LED
Local Control:	1x IP Reset Button
Remote Monitoring/Control:	GUI-based menu via standard Web browser (1x RJ45 rear panel connector; 10/100Base-T)

Section 3 – Installation & Power-up

3.1 Unpacking

You will find the following items in the box:

- AQT8-QAM/IP (QTY=1)
- Power Cord with IEC C13 line socket and 3-pin Type B NEMA 5 plug (QTY=1)
- Blonder Tongue part# 741021800 containing Ethernet cable (QTY=1; see Section 5 for details)

3.2 Installation

The AQT8 Series 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 unit, 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.



Do not block the unit's air intake or air discharge openings.



For safe and reliable operation, the ground pin of the power cord plug must be grounded properly.

3.3 Power-up

To power the unit up, first connect the IEC line cord to the receptacle on the rear panel and then to a 120 VAC power outlet. The input power receptacle is equipped with a fuse-holder and fuse (SLO-BLO, 3.0 Amp, 250V).

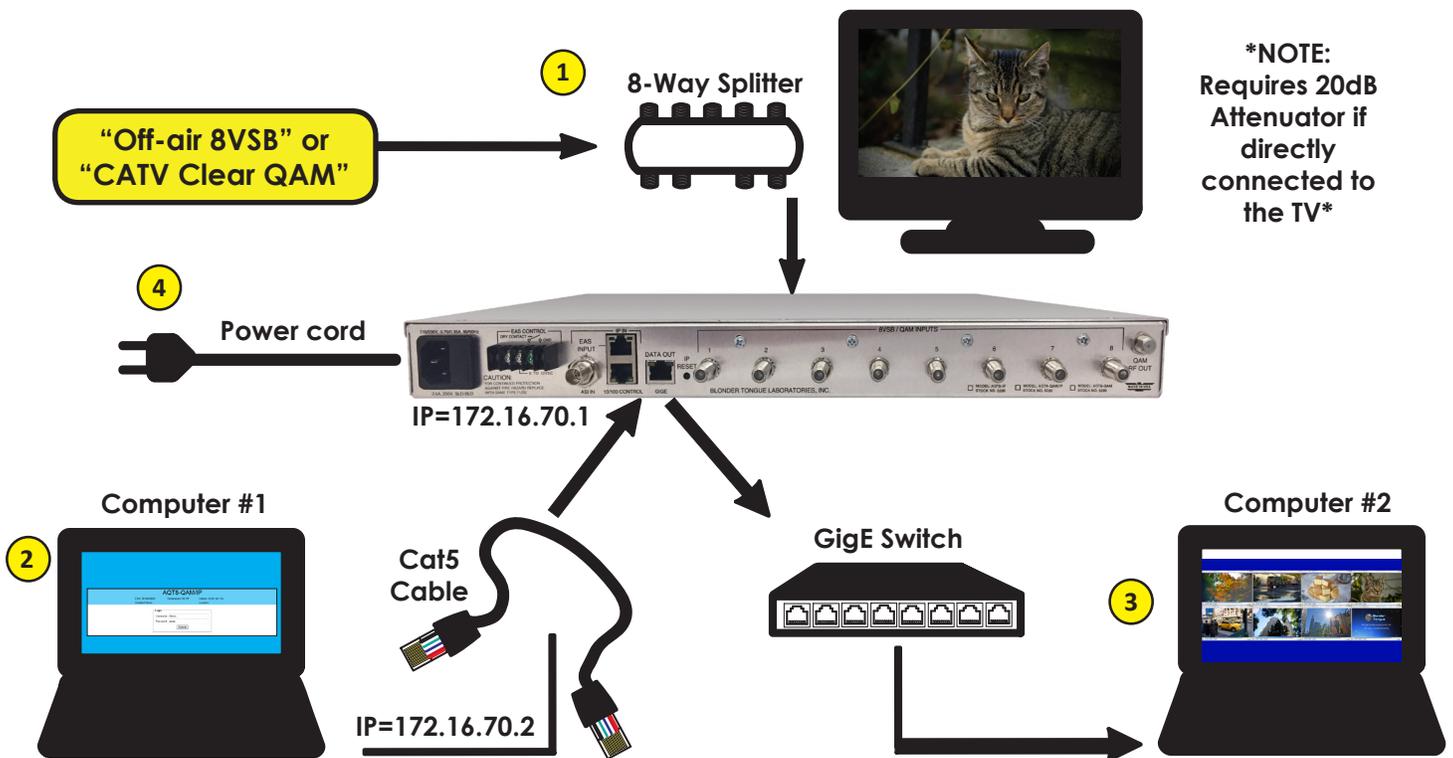


AQT8 and the GigE Switch are considered as elements of an integrated solution. When a power cycle or re-boot is deemed necessary for one element, it may be necessary to power cycle one or all of the other elements as well.

Section 4 - Quick Start Guide

Step 1 - Connect the Inputs

- 1 Up to 8 terrestrial and/or clear QAM inputs via an 8-Way Splitter are connected to the 8VSB/QAM Inputs.
- 2 Connect computer #1 with a web browser to the 10/100 CONTROL port directly using the supplied cable.
- 3 Connect computer #2 with an installed media player (VLC player or equivalent) to a GigE switch and then connect GigE switch to the Data Out port on the unit.
- 4 Connect the power cord to the AQT8.



Step 2 - Login

- Assign 172.16.70.2 as the static IP address for computer #1.
- Enter 172.16.70.1 into your Browser to access the AQT8.
- Login with Username: Admin and the password is "pass".

NOTE: The default IP address for the AQT8 Series is "172.16.70.1".

Login

Username:

Password:

Step 3 - Select Inputs

Go to the "Input Map" page:

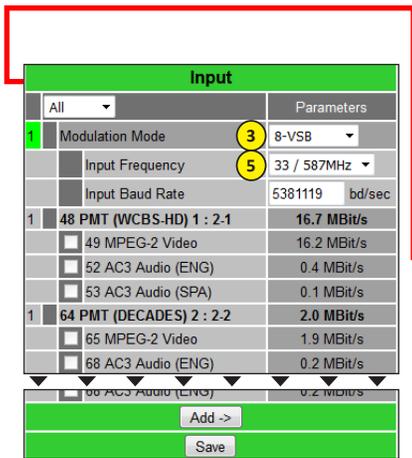
- 1 Select "Edit" at the top of the IP Output – Input table.
- 2 Change the input selection pull down to "All".
- 3 Select Modulation Mode for all inputs. Default is "8VSB". For clear-QAM inputs select applicable modulation mode. If the RF input is not locked to an input or not used, select "Not Used" in the modulation mode box.
- 4 Click "Save".
- 5 Select desired "channel/input frequency".



**The MAXIMUM total number of outputs is 20.
See Appendix C for more details.**

Repeat mode and input settings for all inputs.

- 6 Click "Save".



AQT8-QAM/IP
ESN: 2014040600 Temperature: 99.9°F Uptime: 30d 1h 46m 34s
Headend Name: Location:

Main	Network	Time	Event Log	Logout	Admin
------	---------	------	-----------	--------	-------

Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh																																																						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>IP Output</th> <th>Current Selected Bitrate</th> <th></th> <th>Previously Selected Bitrate</th> <th></th> <th>Total Output Bitrate</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> <tr><td>2</td><td>0.0</td><td>+</td><td>19.0</td><td>=</td><td>19.0</td></tr> <tr><td>3</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> <tr><td>4</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> <tr><td>5</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> <tr><td>6</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> <tr><td>7</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> <tr><td>8</td><td>0.0</td><td>+</td><td>18.4</td><td>=</td><td>18.4</td></tr> </tbody> </table> <p style="font-size: small; color: red; margin-top: 5px;">The first program stream selected will become the "low priority" program in the output stream. This setting is configurable via the MPTS Output Config page.</p> <p style="font-size: small; color: red; margin-top: 5px;">Duplicate PIDs/Program Numbers/Channels/Channel Names may exist when adding programs. Please see the MPTS Output Config page to apply the necessary corrections.</p>							IP Output	Current Selected Bitrate		Previously Selected Bitrate		Total Output Bitrate	1	0.0	+	18.4	=	18.4	2	0.0	+	19.0	=	19.0	3	0.0	+	18.4	=	18.4	4	0.0	+	18.4	=	18.4	5	0.0	+	18.4	=	18.4	6	0.0	+	18.4	=	18.4	7	0.0	+	18.4	=	18.4	8	0.0	+	18.4	=	18.4
IP Output	Current Selected Bitrate		Previously Selected Bitrate		Total Output Bitrate																																																								
1	0.0	+	18.4	=	18.4																																																								
2	0.0	+	19.0	=	19.0																																																								
3	0.0	+	18.4	=	18.4																																																								
4	0.0	+	18.4	=	18.4																																																								
5	0.0	+	18.4	=	18.4																																																								
6	0.0	+	18.4	=	18.4																																																								
7	0.0	+	18.4	=	18.4																																																								
8	0.0	+	18.4	=	18.4																																																								

Input		Parameters
1	Modulation Mode	8-VSB
	Input Frequency	33 / 587MHz
	Input Baud Rate	5381119 bd/sec
1	48 PMT (WCBS-HD) 1 : 2-1	16.7 MBit/s
	49 MPEG-2 Video	16.2 MBit/s
	52 AC3 Audio (ENG)	0.4 MBit/s
	53 AC3 Audio (SPA)	0.1 MBit/s
1	64 PMT (DECADES) 2 : 2-2	2.0 MBit/s
	65 MPEG-2 Video	1.9 MBit/s
	68 AC3 Audio (ENG)	0.2 MBit/s

Input		Parameters
1	Modulation Mode	8-VSB
	Input Frequency	33 / 587 MHz
	Input Baud Rate	5381119 bd/sec
1	48 PMT (WCBS-HD) 1 : 2-1	16.7 MBit/s
	49 MPEG-2 Video	16.2 MBit/s
	52 AC3 Audio (ENG)	0.4 MBit/s
	53 AC3 Audio (SPA)	0.1 MBit/s
1	64 PMT (DECADES) 2 : 2-2	1.7 MBit/s
	65 MPEG-2 Video	1.5 MBit/s
	68 AC3 Audio (ENG)	0.2 MBit/s

IP Output		Bitrates
Output 1 - 239.10.10.50008		18.4 MBit/s
1	48 PMT (WCBS-HD) 1 : 10-1	16.7 MBit/s
	49 MPEG-2 Video	16.2 MBit/s
	52 AC3 Audio (ENG)	0.4 MBit/s
	53 AC3 Audio (SPA)	0.1 MBit/s
1	64 PMT (DECADES) 2 : 10-2	1.7 MBit/s
	65 MPEG-2 Video	1.5 MBit/s
	68 AC3 Audio (ENG)	0.2 MBit/s
Output 2 - 239.10.10.50009		19.0 MBit/s
2	48 PMT (WNBC) 3 : 11-1	15.0 MBit/s
	49 MPEG-2 Video	14.4 MBit/s
	52 AC3 Audio (ENG)	0.4 MBit/s
	53 AC3 Audio (SPA)	0.2 MBit/s
2	64 PMT (COZI-TV) 4 : 11-2	2.7 MBit/s
	65 MPEG-2 Video	2.5 MBit/s

Step 4 - Verify inputs are locked

Verify the front panel LED lights are green for each input.



Step 5 - Check SNR

Go to the "Status" page:

- 1 >22 dB SNR for 8VSB; >33 dB for QAM 256 is recommended.

(Increase the RF input level as required to achieve the desired SNR).

AQT8-QAM/IP							
ESN: 2014040600		Temperature: 99.8°F		Uptime: 30d 1h 45m 11s			
Headend Name:		Location:					
Main	Network	Time	Event Log	Logout			Admin
Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh
Input Status					Output Status		
Input	SNR	RF Chan.	TS Rate (Mbps)	Actual Data Rate (Mbps)	RF Chan.	Status	
1	28.3	33 / 587MHz	19.4	18.6	2 / On	Locked	
2	25.3	28 / 557MHz	19.4	19.1	3 / On		
3	28.9	33 / 587MHz	19.4	18.6	4 / On		
4	27.2	33 / 587MHz	19.4	18.6	5 / On	Locked	
5	27.9	33 / 587MHz	19.4	18.6	54 / On		
6	28.0	33 / 587MHz	19.4	18.6	55 / On		
7	28.3	33 / 587MHz	19.4	18.6	56 / On	Locked	
8	29.8	33 / 587MHz	19.4	18.6	57 / On		

Step 6 - Configure QAM Output

Go to "QAM" page to setup output channels:

- 1 Select the 1st channel for each set of QAM outputs.
- 2 Ensure all outputs are "enabled" and "CW Control" is not selected/enabled.
- 3 "Output Select" allows user to select TS stream for each QAM output. Options are as follows:

- IP Out 1 through IP Out 8
- Default IP or Default RF: QAM1 gets TS from IP Out 1 or RF1 (input), QAM2 gets TS from IP Out 2 or RF2 (input), and so on.

(NOTE: When using any of the IP settings, the particular IP output must be "Enabled". See Step #8.)

- 4 Select the QAM modulation under "Output QAM Mode".
- 5 Click "Save".

AQT8-QAM/IP							
ESN: 2014040600		Temperature: 99.4°F		Uptime: 30d 1h 50m 31s			
Headend Name:		Location:					
Main	Network	Time	Event Log	Logout			Admin
Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh
RF Output Level							
40 dBmV							
QAM Module 1							
Output Channel/Frequency	1 2 / 57MHz	3 / 63MHz	4 / 69MHz	5 / 79MHz			
Output Control	2 On	On	On	On			
CW Control	<input type="checkbox"/> Enable CW for QAM Module						
Output Select	3 Default IP	Default IP	Default IP	Default IP			
Output QAM Mode	4 256B						
Output QAM Data Rate	5 360500 Mbaud						
Output QAM Interleaver	128-1						
Output QAM Alpha	12%						
QAM Lock State	Lock						
QAM Module 2							
Output Channel/Frequency	54 / 405MHz	55 / 411MHz	56 / 417MHz	57 / 423MHz			
Output Control	On	On	On	On			
CW Control	<input type="checkbox"/> Enable CW for QAM Module						
Output Select	Default IP	Default IP	Default IP	Default IP			
Output QAM Mode	256B						
Output QAM Data Rate	5 360500 Mbaud						
Output QAM Interleaver	128-1						
Output QAM Alpha	12%						
QAM Lock State	Lock						
5 Save							

Step 7 - Configure Output

Go to the "Output" Page:

- 1 Select number of IP outputs (from 1 to 8) or "disabled".
- 2 Click "Save".

The screenshot shows the 'Output Mode' configuration page. At the top, there's a navigation bar with 'Main', 'Network', 'Time', 'Event Log', 'Logout', and 'Admin'. Below that, there's a 'Status' bar with 'Input Map', 'MPTS Output Config', 'IP Output Config', 'Output', 'QAM', 'EAS', and 'Refresh'. The main content area has a blue header 'Output Mode' and a dropdown menu '8x IP Outputs' with a circled '1' next to it. Below the dropdown is a table with two sections: 'Input Status' and 'Output Status'. The 'Input Status' table has 8 rows with columns 'Input', 'RF Chan./Frequency', and 'Output Status'. The 'Output Status' table has 8 rows with columns 'Output' and 'RF Channel/State'. At the bottom right, there is a 'Save' button with a circled '2' next to it.

Step 8 - Configure IP Output

Go to the "IP Output Configuration" page:

- 1 Configure the "Dest IP" and "Dest port" for each output stream. Coordinate with the IT System Administrator for required IP addresses.
- 2 Select the encapsulation, "RTP" or "UDP", based on the receiving unit's capabilities.
- 3 "Enable" the IP Output.
(NOTE: Must be enabled when QAM output control in Step 6 is set for IP)
- 4 Click "Save".

The screenshot shows the 'IP Output Configuration' page. At the top, there's a navigation bar with 'Main', 'Network', 'Time', 'Event Log', 'Logout', and 'Admin'. Below that, there's a 'Status' bar with 'Input Map', 'MPTS Output Config', 'IP Output Config', 'Output', 'QAM', 'EAS', and 'Refresh'. The main content area has a blue header 'IP Output Configuration'. Below the header is a table with 8 rows and 9 columns: '#', 'IP Output', 'ASI Output', 'Dest IP', 'Encap.', 'Dest. Port', 'Src. Port', 'Time to Live', and 'Stuffing'. The 'IP Output' column has dropdown menus for 'Enable' and 'Disable'. The 'Dest IP' column has text input fields. The 'Encap.' column has dropdown menus for 'UDP'. The 'Dest. Port' and 'Src. Port' columns have text input fields. The 'Time to Live' column has text input fields. The 'Stuffing' column has dropdown menus for 'Enable' and 'Disable'. At the bottom right, there is a 'Save' button with a circled '4' next to it.

Step 9 - Select Output

Go back to the "Input Map" page:

- 1 Click the "Edit" button at the top of the Input table.
- 2 Put check marks next to desired programming by clicking the appropriate box(s).
- 3 Select the Output
- 4 Click "Add".

Repeat for each output program. The unit supports 1 video and 3 audios for each program. Video starts streaming once added to the IP Output table.

The first program stream selected will become the "low priority" program in the output stream. This setting is configurable via the [MPTS Output Config](#) page. Duplicate PIDs/Program Numbers/Channels/Channel Names may exist when adding programs. Please see the [MPTS Output Config](#) page to apply the necessary corrections.

IP Output	Current Selected Bitrate	Previously Selected Bitrate	Total Output Bitrate
1	0.0	+ 18.7	= 18.7
2	0.0	+ 19.0	= 19.0
3	0.0	+ 18.7	= 18.7
4	0.0	+ 18.7	= 18.7
5	0.0	+ 18.7	= 18.7
6	0.0	+ 18.7	= 18.7
7	0.0	+ 18.7	= 18.7
8	0.0	+ 18.7	= 18.7

Input	Parameters
Input 1	8-VSB
Modulation Mode	33 / 587 MHz
Input Frequency	5381119 bd/sec
Input Baud Rate	16.7 MBit/s
48 PMT (WCBS-HD) 1 : 2-1	16.2 MBit/s
49 MPEG-2 Video	0.4 MBit/s
52 AC3 Audio (ENG)	0.1 MBit/s
53 AC3 Audio (SPA)	1.7 MBit/s
64 PMT (DECADES) 2 : 2-2	1.5 MBit/s
65 MPEG-2 Video	0.2 MBit/s
68 AC3 Audio (ENG)	

IP Output	Bitrates
Output 1 - 192.168.253.100:50000	18.7 MBit/s
48 PMT (WCBS-HD) 1 : 10-1	16.7 MBit/s
49 MPEG-2 Video	16.2 MBit/s
52 AC3 Audio (ENG)	0.4 MBit/s
53 AC3 Audio (SPA)	0.1 MBit/s
64 PMT (DECADES) 2 : 10-2	2.0 MBit/s
65 MPEG-2 Video	1.9 MBit/s
68 AC3 Audio (ENG)	0.2 MBit/s
Output 2 - 192.168.253.100:50001	19.0 MBit/s
48 PMT (WNBC) 3 : 11-1	16.3 MBit/s
49 MPEG-2 Video	15.7 MBit/s
52 AC3 Audio (ENG)	0.4 MBit/s
53 AC3 Audio (SPA)	0.2 MBit/s
64 PMT (COZI-TV) 4 : 11-2	2.7 MBit/s
65 MPEG-2 Video	2.5 MBit/s

Step 10 - Perform channel scan on TV

Perform channel scan on TV. (CATV Digital - standard).

Confirm channel output on TV. Note the that TV will display the virtual channel numbers as set by the content provider and not those set in Step 6 when in default QAM mode. When in "Default IP" mode, channels will be as defined in the MPTS Output Config Tab.

Step 11 - Confirm streaming programs

Open the media player (VLC or equiv.). Enter IP addresses as as assigned in Step 8 and confirm programs are being streamed.

Section 5 – 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 cable that is provided in the hardware bag to unit's rear-panel RJ45 interface marked "10/100 Remote Control". 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 6 – Configuring the Unit

6.1 Accessing the Unit via a Web Browser

You must complete the steps described in Section 5 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 6.1) will appear.

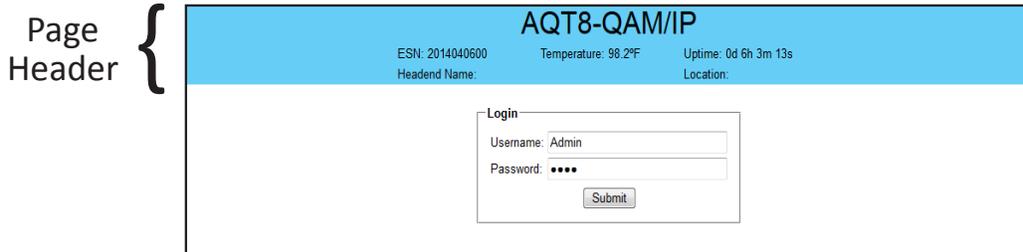


Figure 6.1 - "Login" Screen

- (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 6.2, under the blue "page header" the following Primary tabs will appear:

- Primary tab "**Main**" includes the following sub-tabs: Status, Input Map, MPTS Output Config, IP Output Config, Output, QAM, EAS, 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.
- Primary tab "**Admin**" doesn't include any sub-tab.

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

6.2 "Main > Status" Screen

The "Main > Status" screen (Figure 6.2) is a "read-only" screen and displays input and output information on each of the eight (8) channels.

- 1 Input:** indicates the physical RF input and Transport Stream (TS) status. If background is red, there is no TS detected or TS invalid.

6.2 "Main > Status" Screen (continued)

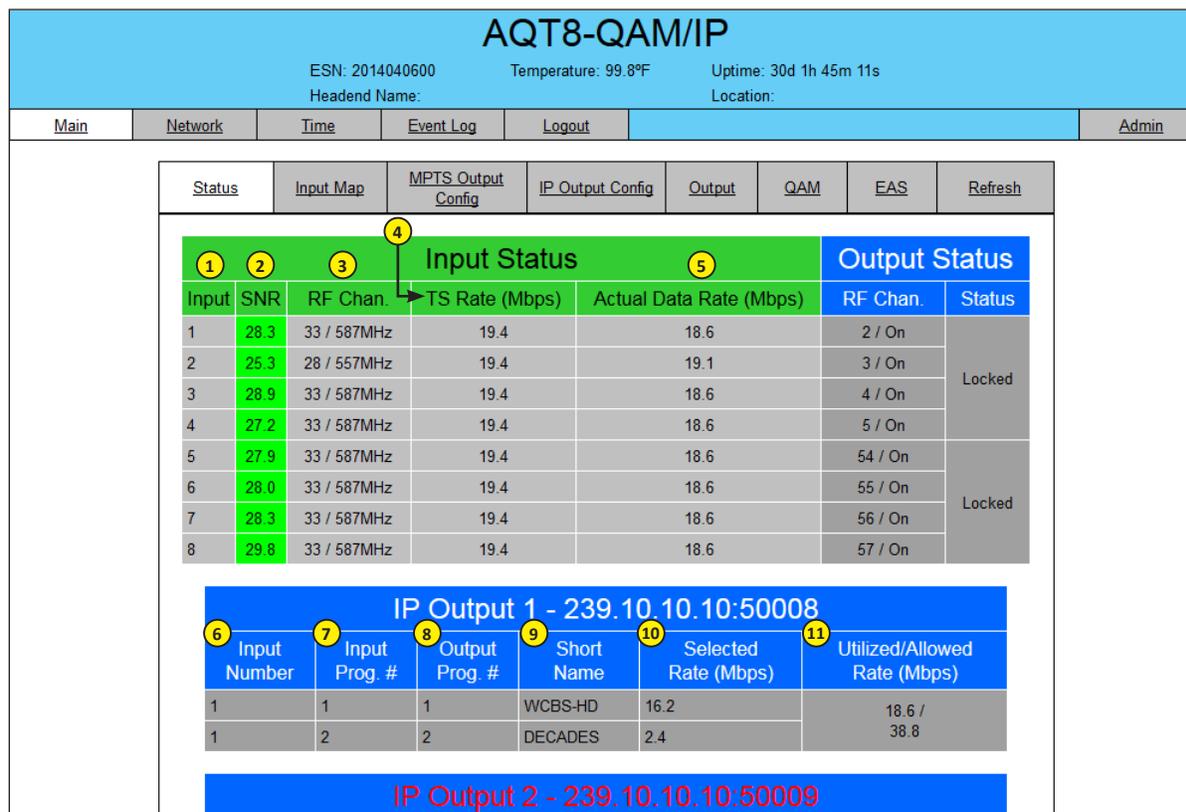


Figure 6.2 - "Main > Status" Screen

- 2 SNR:** indicates the Signal-to-Noise Ratio of the input RF channel.
Use this only as a reference for the received input signal quality. This may not accurately reflect the output picture quality as digital signals are more precisely categorized by the modulation error rate (MER), of which SNR is just one component.
- 3 RF Chan. :** indicates the channel number and center frequency the port is tuned to.
- 4 TS Rate (Mbps):** indicates the incoming transport stream rate as provided by the content provider. Maximum values allowed by relevant standards are:
19.4 Mbps for over-the-air transmission.
38.8 Mbps for transmission over cable.
- 5 Actual Data Rate (Mbps):** indicates the actual input data rate received from the content provider.
- 6 Input Number:** indicates the physical RF input the program is selected from.
- 7 Input Prog.#:** indicates the program number selected by the user (the program number is assigned by the content provider).
- 8 Output Prog.#:** indicates the user-selectable MPEG output program number - duplicates are not allowed within the same IP output.
- 9 Short Name:** indicates the user-selectable name of the program - duplicates are not allowed. The program name may have up to 7 characters.

Modulation	Poor	Marginal	Acceptable
Auto QAM	<28	=>28 & <31	=>31
QAM 256B	<28	=>28 & <31	=>31
QAM 64B	<22	=>22 & <25	=>25
QAM 256A	<28	=>28 & <31	=>31
QAM 128A	<25	=>25 & <28	=>28
QAM 64A	<22	=>22 & <25	=>25
QAM 32A	<19	=>19 & <22	=>22
QAM 16A	<16	=>16 & <19	=>19
8VSB	<17	=>17 & <19	=>19

Green=Acceptable, Yellow=Marginal, Red = Poor Input

6.2 "Main > Status" Screen (continued)

- 10 **Selected Rate (Mbps):** indicates the transmission rate of the corresponding output program.
- 11 **Utilized / Allowed Rate (Mbps):** indicates the total output rate of
 - (i) the multiplexed MPTS, and
 - (ii) the maximum allowed bitrate assigned by the user.



The **MAXIMUM** total number of outputs is 20. Refer to Appendix C for more details.

6.3 "Main > Input Map" Screen

The "Main > Input Map" screen (Figures 6.3a, 6.3b, and 6.3c on the following pages) is "user-configurable" with the following parameters. This tab is only displayed when the output mode (see section 6.6) is active.

In the section under the green header, the user can select the programs to be included in the multiplexed MPTS output stream as follows:

Refer to figure 6.3a:

- 1 **Input #:** Indicates the physical RF interface. Selections are: "Input 1" to "Input 8" (one at a time), or "All" to show all eight inputs on the screen.
- 2 **Edit:** Click "Edit" button to allow editing of the page.

Refer to figure 6.3b:

- 3 **Modulation Mode:** Select the appropriate modulation mode to match the input. If an RF input is not used or not locked to an input signal, select "not used".
- 4 **Input Frequency:** From the pull-down menu, Select the desired channel/frequency (center) for each input.
- 5 **Input Baud Rate:** Displays the input baud rate commonly used for the selected mode. This window can also be edited, allowing the user to enter and save any custom baud rate desired. **The chart to the right** shows the factory defaults.

AQT8 Input Baud Rate Factory Defaults	
Mode	Baud Rate (bd/sec)
8VSB, 16VSB	5381119
QAM256B	5360437
QAM64B	5056971
QAM256A	5000000
QAM128A	5333300
QAM64A	5000000
QAM32A	5000000
QAM16A	5589500

- 6 In the section entitled "IP Output" under the blue header, the user can view the list of the programs present in each output stream, and the corresponding bit rate.



When output mode is disabled, "IP Output Config" tab and "MPTS Output Config" tab will not appear on web page. Must have at least 1 output enabled to use tabs.

- 7 **Remove:** The user can remove any of the programs from the current list by selecting them and clicking the "Remove" button.

The top section in white assists the user to estimate the IP bit rate for each IP output.

- 8 **Current Selected Bitrate:** indicates the bitrate of the selected programs to be added from the Input.
- 9 **Previously Selected Bitrate:** indicates the total bitrate of the already selected programs of each IP output.

6.3 "Main > Input Map" Screen (continued)

Main	Network	Time	Event Log	Logout				Admin
Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh	
IP Output	Current Selected Bitrate		Previously Selected Bitrate		Total Output Bitrate			
1	0.0	+	18.4	=	18.4			
2	0.0	+	19.0	=	19.0			
3	0.0	+	18.4	=	18.4			
4	0.0	+	18.4	=	18.4			
5	0.0	+	18.4	=	18.4			
6	0.0	+	18.4	=	18.4			
7	0.0	+	18.4	=	18.4			
8	0.0	+	18.4	=	18.4			
<p>The first program stream selected will become the "low priority" program in the output stream. This setting is configurable via the MPTS Output Config page.</p> <p>Duplicate PIDs/Program Numbers/Channels/Channel Names may exist when adding programs. Please see the MPTS Output Config page to apply the necessary corrections.</p>								
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 2 Edit </div>				IP Output		Bitrates		
Input				Output 1 - 239.10.10.10:50008		18.4 MBit/s		
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 1 Input 1 ▾ </div>		Parameters						
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 3 Modulation Mode </div>		8-VSB						
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 4 Input Frequency </div>		33 / 587 MHz						
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 5 Input Baud Rate </div>		5381119 bd/sec						
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 13 1 </div>		48 PMT (WCBS-HD) 1 : 2-1		16.7 MBit/s				
		<input type="checkbox"/> 49 MPEG-2 Video		16.2 MBit/s				
		<input type="checkbox"/> 52 AC3 Audio (ENG)		0.4 MBit/s				
		<input type="checkbox"/> 53 AC3 Audio (SPA)		0.1 MBit/s				
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 14 1 </div>		64 PMT (DECADES) 2 : 2-2		2.0 MBit/s				
		<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s				
		<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s				
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 11 Add -> </div>								
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 12 Save </div>								
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 6 IP Output </div>				
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 15 Output 1 - 192.168.253.100:50000 </div>		18.7 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 1 48 PMT (WCBS-HD) 1 : 10-1 </div>		16.7 MBit/s		
				<input type="checkbox"/> 49 MPEG-2 Video		16.2 MBit/s		
				<input type="checkbox"/> 52 AC3 Audio (ENG)		0.4 MBit/s		
				<input type="checkbox"/> 53 AC3 Audio (SPA)		0.1 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 1 64 PMT (DECADES) 2 : 10-2 </div>		2.0 MBit/s		
				<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s		
				<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 7 Output 2 - 192.168.253.100:50001 </div>		19.0 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 2 48 PMT (WNBC) 3 : 11-1 </div>		16.3 MBit/s		
				<input type="checkbox"/> 49 MPEG-2 Video		15.7 MBit/s		
				<input type="checkbox"/> 52 AC3 Audio (ENG)		0.4 MBit/s		
				<input type="checkbox"/> 53 AC3 Audio (SPA)		0.2 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 2 64 PMT (COZI-TV) 4 : 11-2 </div>		2.7 MBit/s		
				<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s		
				<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 8 64 PMT (DECADES) 16 : 17-2 </div>		2.0 MBit/s		
				<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s		
				<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s		
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 7 <- Remove </div>				

Figure 6.3a - "Input Map" Screen

Main	Network	Time	Event Log	Logout				Admin	
Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh		
IP Output	Current Selected Bitrate		Previously Selected Bitrate		Total Output Bitrate				
1	0.0	+	18.7	=	18.7				
2	0.0	+	19.0	=	19.0				
3	0.0	+	18.7	=	18.7				
4	0.0	+	18.7	=	18.7				
5	0.0	+	18.7	=	18.7				
6	0.0	+	18.7	=	18.7				
7	0.0	+	18.7	=	18.7				
8	0.0	+	18.7	=	18.7				
<p>The first program stream selected will become the "low priority" program in the output stream. This setting is configurable via the MPTS Output Config page.</p> <p>Duplicate PIDs/Program Numbers/Channels/Channel Names may exist when adding programs. Please see the MPTS Output Config page to apply the necessary corrections.</p>									
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 8 Input </div>				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 9 IP Output </div>		<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 10 Bitrates </div>			
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 3 Input 1 ▾ </div>		Parameters							
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 4 Modulation Mode </div>		8-VSB							
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 5 Input Frequency </div>		33 / 587MHz							
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 13 Input Baud Rate </div>		5381119 bd/sec							
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 14 1 </div>		48 PMT (WCBS-HD) 1 : 2-1		16.7 MBit/s					
		<input type="checkbox"/> 49 MPEG-2 Video		16.2 MBit/s					
		<input type="checkbox"/> 52 AC3 Audio (ENG)		0.4 MBit/s					
		<input type="checkbox"/> 53 AC3 Audio (SPA)		0.1 MBit/s					
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 15 1 </div>		64 PMT (DECADES) 2 : 2-2		2.0 MBit/s					
		<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s					
		<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s					
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 11 Add -> </div>									
<div style="background-color: #008000; color: white; padding: 2px; text-align: center;"> 12 Save </div>									
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 6 IP Output </div>					
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 15 Output 1 - 192.168.253.100:50000 </div>		18.7 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 1 48 PMT (WCBS-HD) 1 : 10-1 </div>		16.7 MBit/s			
				<input type="checkbox"/> 49 MPEG-2 Video		16.2 MBit/s			
				<input type="checkbox"/> 52 AC3 Audio (ENG)		0.4 MBit/s			
				<input type="checkbox"/> 53 AC3 Audio (SPA)		0.1 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 1 64 PMT (DECADES) 2 : 10-2 </div>		2.0 MBit/s			
				<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s			
				<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 7 Output 2 - 192.168.253.100:50001 </div>		19.0 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 2 48 PMT (WNBC) 3 : 11-1 </div>		16.3 MBit/s			
				<input type="checkbox"/> 49 MPEG-2 Video		15.7 MBit/s			
				<input type="checkbox"/> 52 AC3 Audio (ENG)		0.4 MBit/s			
				<input type="checkbox"/> 53 AC3 Audio (SPA)		0.2 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 2 64 PMT (COZI-TV) 4 : 11-2 </div>		2.7 MBit/s			
				<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s			
				<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 8 64 PMT (DECADES) 16 : 17-2 </div>		2.0 MBit/s			
				<input type="checkbox"/> 65 MPEG-2 Video		1.9 MBit/s			
				<input type="checkbox"/> 68 AC3 Audio (ENG)		0.2 MBit/s			
				<div style="background-color: #000080; color: white; padding: 2px; text-align: center;"> 7 <- Remove </div>					

Figure 6.3b - "Input Map" Screen

6.3 "Main > Input Map" Screen (continued)

10 **Total Output Bitrate:** indicates the total bitrate of all current and previously selected programs. Total bitrate should not exceed TS bitrate assigned in MPTS output config page, item **2**, default is 38800000

To select programs for IP Output:

- 2** Step 1: Click the **edit** button
- 13** Step 2: Put check marks next to desired programming by clicking the appropriate box(s)
- 14** Step 3: Select the output
- 11** Step 4: Click **Add**
- 12** Step 5: Click **Save**

15 "**Bitrate**" check box(es) (Figure 6.3b & 6.3c) will display ONLY when the "Average Bit Rate" setting on the bottom of the Admin Page has been set to "Enable" and the "Edit" button (**2**) has been clicked on (Figure 6.3a). Checked programs will have the unit overwrite the peak video rate declared in the video elementary stream. This is used only when the content provider is exceeding the bitrate compared to what is declared in the MPEG 2 programs stream. Refer to **26** in Section 6.11 for more information.

The first program stream selected will become the "low priority" program in the output stream.
This setting is configurable via the [MPTS Output Config](#) page.
Duplicate PIDs/Program Numbers/Channels/Channel Names may exist when adding programs.
Please see the [MPTS Output Config](#) page to apply the necessary corrections.

Input		IP Output	Bitrates
Input 1 - Parameters		<input checked="" type="radio"/> Output 1 - 192.168.253.100:50000	18.8 MBit/s
<input checked="" type="checkbox"/>	Modulation Mode: 8-VSB	<input checked="" type="checkbox"/> 48 PMT (WCBS-HD) 1 : 10-1	16.4 MBit/s 15
	Input Frequency: 33 / 587MHz	<input type="checkbox"/> 49 MPEG-2 Video	15.9 MBit/s
	Input Baud Rate: 5381119 bd/sec	<input type="checkbox"/> 52 AC3 Audio (ENG)	0.4 MBit/s
<input checked="" type="checkbox"/>	48 PMT (WCBS-HD) 1 : 2-1	<input type="checkbox"/> 53 AC3 Audio (SPA)	0.1 MBit/s
	<input type="checkbox"/> 49 MPEG-2 Video	<input type="checkbox"/> 64 PMT (DECADES) 2 : 10-2	2.3 MBit/s
	<input type="checkbox"/> 52 AC3 Audio (ENG)	<input type="checkbox"/> 65 MPEG-2 Video	2.1 MBit/s
	<input type="checkbox"/> 53 AC3 Audio (SPA)	<input type="checkbox"/> 68 AC3 Audio (ENG)	0.2 MBit/s
<input checked="" type="checkbox"/>	64 PMT (DECADES) 2 : 2-2	<input checked="" type="radio"/> Output 2 - 192.168.253.100:50001	19.0 MBit/s
	<input type="checkbox"/> 65 MPEG-2 Video	<input type="checkbox"/> 48 PMT (WNBC) 3 : 11-1	17.0 MBit/s
		<input type="checkbox"/> 49 MPEG-2 Video	16.4 MBit/s

Figure 6.3c - "Input Map" Screen with Average Bitrate Enabled



The **MAXIMUM** total number of outputs is 20. See Appendix C for more details.



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

6.4 "Main > MPTS Output Config" Screen

The "Main > MPTS Output Config" screen (Figure 6.4, next page) is a "read and write" screen where the following output parameters are configured and displayed for each multiplexed MPTS output stream. This tab is only displayed when the output mode (see section 6.6) is active.

In the section entitled "MPTS Output Configuration", the user can select and configure the following parameters of the output:

1 **TS ID:** Enter the identification number for the Transport Stream (TS) output. The range is 1 to 65535. The TS ID assigned to each multiplexed MPTS output stream must be unique.

6.4 "Main > MPTS Output Config" Screen (continued)

In the section entitled "Oversubscription Configuration", the user can select and configure the following parameters for all output streams. These settings allow the user to define rules when low priority streams may be removed in order to keep output bit rate within selected limits.

- 6 Control:** Removes a program from the output stream if the program causes the stream bitrate to exceed the user-assigned output bitrate. Options are Enable and Disable.
- 7 Occurrences:** Allows setting the threshold value for the number of times that a program is allowed to cause the output stream to exceed the user-assigned total output bitrate assigned in. The selectable values are 2 to 10.
- 8 Time Window (minutes):** Allows setting the time frame. Options are 1 to 10 minutes.

NOTE: The "Oversubscription Configuration" feature works in conjunction with the "Low Priority" feature described below.

In the section entitled "IP Output Mapping", the user can select and configure the following parameters for each output stream indicated by "Output # - IP Address:Port Number", under gray header:

- 9 8VSB/QAM Input:** Indicates the list of programs selected by the user which are included in the output stream.
- 10 PID:** Indicates the PID value assigned to each elementary stream. PID (Packet Identifier) values are embedded by the content provider in the MPEG-2/H.264 stream to identify tables and programming packets.
- 11 Program Number:** 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).
- 12 Short Name:** Enter to change or add the short name of the channel. Up to 7 alphanumeric characters are allowed.
- 13 Major Channel:** Enter the major channel number for the output program. The range is 1 to 99 for Terrestrial and 1 to 999 for Cable.
- 14 Minor Channel:** The range is 1 to 99 Terrestrial and 0 to 999 for Cable. When "Output Type" #3 above is set to "CABLE" and a "0" is entered as the minor channel, the Major channel will be displayed as a one part channel number (ie: 550 major & 0 minor displayed on TV as 550). "0" is only valid with Cable (CVCT) and is not applicable to Terrestrial (TVCT).
- 15 Low Priority:** A program number marked as low priority will be removed from the output when it causes the output to exceed the total output bitrate assigned by user in **2** of this section.

This feature works in conjunction with the "Oversubscription Configuration" described in **6**, **7** & **8** above. By default the first program number in the ASI Input will be assigned as low priority. The user can select only one program number at a time in the output stream as low priority.

When the program marked as low priority is removed from the output stream due to violation of the Oversubscription Configuration (See **6**, **7** & **8** above for details), the message "Output Oversubscribed!" will appear on all screens.

6.5 "Main > IP Output Config" Screen

The "Main > IP Output Config" screen (Figure 6.5) is a "read and write" screen where the following parameters are configured and displayed for each IP Output configuration. This tab is only displayed when the output mode (see section 6.6) is active.

Main		Network	Time	Event Log	Logout				Admin
Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh		
IP Output Configuration									
#	1 IP Output	2 ASI Output	3 Dest. IP	4 Encap	5 Dest. Port	6 Src. Port	7 Time to Live	8 Stuffing	
1	Enable	<input checked="" type="radio"/>	239.10.10.10	UDP	50008	50008	128	Enable	
2	Disable	<input type="radio"/>	239.10.10.10	UDP	50009	50009	128	Enable	
3	Disable	<input type="radio"/>	239.10.10.10	UDP	50010	50010	128	Enable	
4	Disable	<input type="radio"/>	239.10.10.10	UDP	50011	50011	128	Enable	
5	Disable	<input type="radio"/>	239.10.10.10	UDP	50012	50012	128	Enable	
6	Enable	<input type="radio"/>	239.10.10.10	UDP	50013	50013	128	Enable	
7	Disable	<input type="radio"/>	239.10.10.10	UDP	50014	50014	128	Enable	
8	Disable	<input type="radio"/>	239.10.10.10	UDP	50015	50015	128	Enable	

Save

Figure 6.5 - "Main > IP Output Config" Screen



When output mode is disabled, the "IP Output Config" tab and "MPTS Output Config" tab will not appear on web page. The unit must have at least 1 output enabled in order to use the tabs.

- 1 IP Output:** allows user to Enable/Disable each IP Output.

NOTE: When an "IP Output" is Disabled, the "Main > Status" screen will show the disabled output highlighted in red. (See Figure 6.2 for details)
- 2 ASI Output:** allows the user to select the IP output which will be present at the front panel ASI output.
- 3 Destination IP:** allows user to assign the IP address of the receiving equipment.
- 4 Encapsulation:** there are two available options (RTP & UDP), the user must select the one that matches the protocol used by the receiving equipment.
- 5 Destination Port:** user must enter IP Port of the receiving equipment. The range is 1 to 65535. (Factory Default: 50000)
- 6 Source Port:** must enter IP Port of the equipment that Input IP source is generated from. The range is 1 to 65535. (Factory Default: 50000)

NOTE: Port number is recommended to be from 49152 to 65535 and unique for each IP output.
Reason: Port 1-1023 and 1024-49151 are the Reserved Ports and the Registered Ports, respectively.
- 7 Time to Live:** is a limit setting 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: 128)
- 8 Stuffing:** Null packets are inserted to ensure that the TS bitrate assigned in **2** of Section 6.4 remains constant. Options are Enable and Disable. It is advisable to Disable stuffing when only GigE output is used to help reduce network traffic.



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

6.6 "Main > Output" Screen

The "Main > Output" screen (Figure 6.6) is a "user-configurable" screen for the Output Mode. The Output Mode is selectable from 1 to 8x IP Outputs or disabled.

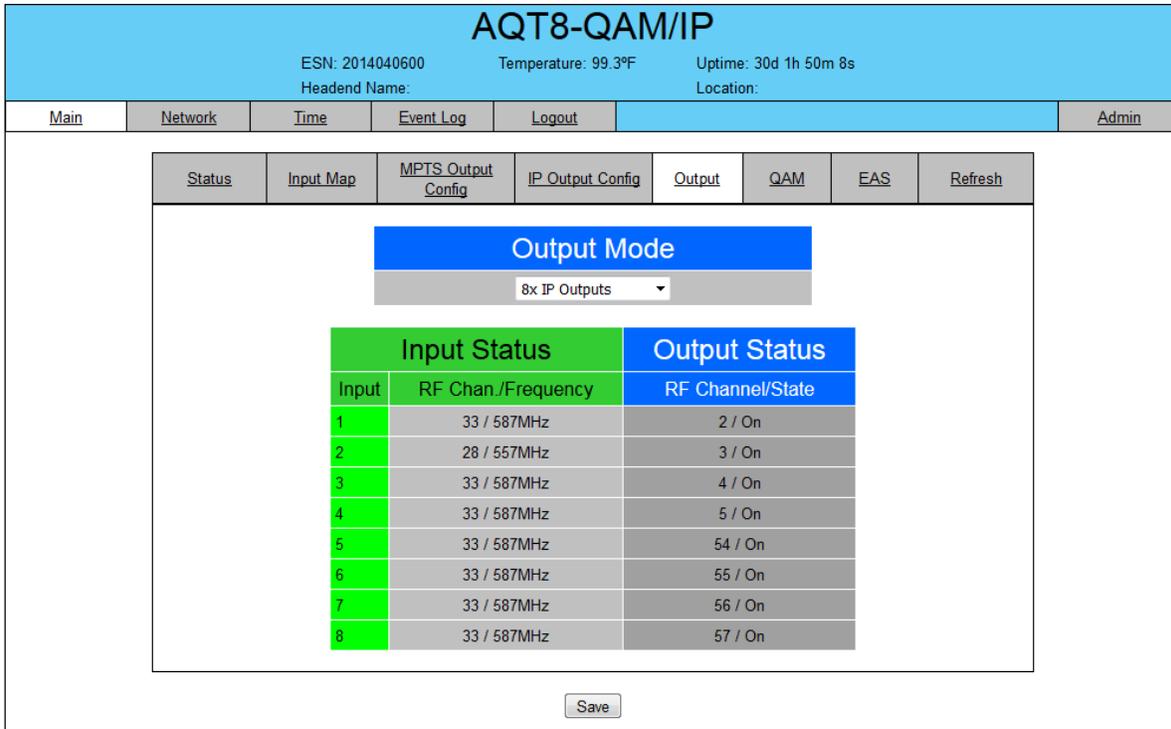


Figure 6.6 - "Main > Output" Screen



When output mode is disabled, "IP Output Config" tab and "MPTS Output Config" tab will not appear on web page. Must have at least 1 output enabled to use tabs.



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

6.7 "Main > QAM" Screen

The "Main > QAM" screen (Figure 6.7, next page) is "user-configurable" for assigning QAM parameters.

- 1 **RF Output Level:** Selects the QAM RF output level for the combined output. The range is 28 to 42 dBmV.
- 2 **Output Channel/Frequency:** Allows the user to assign an RF channel number to the RF QAM output of the Quad-QAM module (i.e. RF channel 54, as shown in Figure 6.7, "Module 2"). The remaining three RF QAM channels will be automatically assigned to the next higher adjacent channels (i.e. RF channels 55, 56 and 57). 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.

- 3 **Output Control:** Allows the user individually turn on/off each of the 4 QAM RF channels.

6.7 "Main > QAM" Screen (continued)

AQT8-QAM/IP

ESN: 2014040600 Temperature: 99.4°F Uptime: 30d 1h 50m 31s
 Headend Name: Location:

Main
Network
Time
Event Log
Logout
Admin

Status	Input Map	MPTS Output Config	IP Output Config	Output	QAM	EAS	Refresh
--------	-----------	--------------------	------------------	--------	-----	-----	---------

1 **RF Output Level**

40 ▾ dBmV

QAM Module 1

2 Output Channel/Frequency	2 / 57MHz ▾	3 / 63MHz ▾	4 / 69MHz ▾	5 / 79MHz ▾
3 Output Control	On ▾	On ▾	On ▾	On ▾
4 CW Control	<input type="checkbox"/> Enable CW for QAM Module			
5 Output Select	Default IP ▾	Default IP ▾	Default IP ▾	Default IP ▾
6 Output QAM Mode	256B ▾			
7 Output QAM Data Rate	5.360500 Mbaud			
8 Output QAM Interleaver	128-1			
9 Output QAM Alpha	12%			
10 QAM Lock State	Lock			

QAM Module 2

Output Channel/Frequency	54 / 405MHz ▾	55 / 411MHz ▾	56 / 417MHz ▾	57 / 423MHz ▾
Output Control	On ▾	On ▾	On ▾	On ▾
CW Control	<input type="checkbox"/> Enable CW for QAM Module			
Output Select	Default IP ▾	Default IP ▾	Default IP ▾	Default IP ▾
Output QAM Mode	256B ▾			
Output QAM Data Rate	5.360500 Mbaud			
Output QAM Interleaver	128-1			
Output QAM Alpha	12%			
QAM Lock State	Lock			

Figure 6.7 - "QAM" Screen

- 4 **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 comparable to the digital QAM output level. In CW mode all 4 channels on the QAM output module will be on regardless of the "Output Control" setting. CW mode is typically used when an analog signal level meter is used to measure the unit's output level during installation and servicing.

NOTE: CW carriers are at center frequency and NOT at analog video carrier frequency.

- 5 **Output Select:** Allows user to select TS stream for each QAM output. The options are: IP Out 1 through IP Out 8, default IP and default RF (pass-through). Default IP/RF means that QAM1 will get TS from IP Out 1 or RF 1 (input), QAM 2 will get TS from IP Out 2 or RF 2 (input, and so on)

NOTE: When using any of the IP settings, the particular IP output must be "enabled" see Section 6.5.

6.7 "Main > QAM" Screen (continued)

- 6 **Output QAM Mode:** Allows the user to select the desired QAM modulation mode. Options are: 64B, 256B, 16A, 32A, 64A, 128A, and 256A. For most applications in the USA, the recommended QAM modulation mode is 256B.
- 7 **Output QAM Data Rate:** Indicates the standard baud 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.



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

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

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

6.8 "Main > EAS" Screen

The "Main > EAS" screen (Figure 6.8, next page) is an EAS feature enabling all input program streams to be replaced by the input present on the ASI or IP input. This web page allows the user select between ASI and IP. For IP, the user also enters the address, port and protocol. Commands are available for manual test of the EAS mode. This tab is only displayed when the output mode (see Section 6.6) is active.

The TS requirements for the EAS input are as follows:

- (1) The ASI input should be a single program input with (PMT[O]). If multiple programs are present in the EAS TS input, then program #1 (PMT(O) or first PMT) will be selected for EAS override. The other programs will be ignored.
- (2) If ASI input #1 thru #11 have multiple audios, then only the first Audio service is overridden with EAS Audio.

The front panel ASI Input LEDs will be flashing green when EAS is activated.

Upon removing the trigger mechanism the unit will return to its normal operation.

When EAS source = IP

- 1 Shows the IP information and software version of the unit.
 - 2 **EAS IP address:** user must enter EAS stream source IP address and port.
 - 3 EAS IP protocol, options are **RTP and UDP**.
 - 4 EAS source selection is **IP or ASI** . For IP use RJ-45 connection on rear of unit. For ASI use BNC connector on rear of unit.
 - 5 **EAS Stream info:** Provides stream information for EAS.
-
- 6 **EAS Override:** overrides the external EAS Trigger and releases the forced trigger for testing purposes.

6.8 "Main > EAS" Screen (continued)

AQT8-QAM/IP

ESN: 2014040600
Temperature: 99.4°F
Uptime: 30d 1h 51m 38s

Headend Name:
Location:

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

Status
Input Map
MPTS Output Config
IP Output Config
Output
QAM
EAS
Refresh

1 → **IP Information**

Control Port MAC Address: 00:14:39:00:3F:FD
 Control Port IP Address: 172.16.182.39
 Control Port Subnet Mask: 255.255.255.0
 Control Port Default Gateway: 172.16.182.254

EAS Port MAC Address: 00:14:39:00:3F:FE
 EAS Port IP Address: 192.168.252.2
 EAS Port Subnet Mask: 255.255.255.0
 EAS Port Default Gateway: 192.168.252.254

GigE Port MAC Address: 00:14:39:00:3F:FF
 GigE IP Address: 192.168.253.1
 GigE Subnet Mask: 255.255.255.0
 GigE Default Gateway: 192.168.253.254

Software Version: 1.0.10 Prerelease 17
 CPU Version: 1.2.0
 MUX Version: 1.20
 Unit Serial Number: 2014040600
 Headend Name:
 Location:

2 → **EAS Configuration**

EAS Group IP:
 EAS Group Port:

3 → EAS Source RTP / UDP: RTP UDP
4 → EAS Source IP / ASI: IP ASI

5 → **EAS Stream Info**

Status	PID / Program	Bit Rate
EAS Enabled	EAS Stream Not Found	

6 → **EAS Testing Facilities**

EAS Override:

Figure 6.8 - "Main > EAS" Screen



All IP programs will be replaced by EAS stream. When in RF pass-through mode - QAM channels will not have EAS messaging.



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

6.9 "Main > Refresh" Tab

The "Main > Refresh" tab can be clicked while on any screen. When clicked, it will update all relevant fields/parameters of the active screen as that information is retrieved from the unit in a real-time basis.

6.10 "Network" Screen

The "Network" screen (Figure 6.10) is a user-configurable screen where the following parameters are displayed or configured:

The screenshot shows the "Network" configuration screen for the AQT8-QAM/IP unit. At the top, it displays the unit's ESN (2014040600), temperature (99.4°F), and uptime (30d 1h 52m 7s). Below this is a navigation bar with tabs for Main, Network, Time, Event Log, Logout, and Admin. The main content area lists various network parameters, each with a numbered callout (1-19) indicating its location. The parameters are: Control Port MAC Address (00:14:39:00:3F:FD), EAS Port MAC Address (00:14:39:00:3F:FE), GigE Port MAC Address (00:14:39:00:3F:FF), Software Version (1.0.10 Prerelease 17), CPU Version (1.2.0), MUX Version (1.20), Unit Serial Number (2014040600), Headend Name (text input), Location (text input), Login Timeout (Minutes) (dropdown menu set to 15), Control Port IP Address (172.16.182.39), Control Port Subnet Mask (255.255.255.0), Control Port Default Gateway (172.16.182.254), EAS Port IP Address (192.168.252.2), EAS Port Subnet Mask (255.255.255.0), EAS Port Default Gateway (192.168.252.254), GigE Port IP Address (192.168.253.1), Event Log Destination (172.16.70.2), Log Destination Port # (514), EAS Group IP (229.1.2.3), and EAS Group Port (5000). A "Save" button is located at the bottom of the screen.

Figure 6.10 - "Network" Screen

- 1 **Ethernet 1 MAC Address:** indicates the MAC Address of the "Remote Control 10/100" Port.
- 2 **EAS port MAC address:** indicates the MAC address of the EAS port.
- 3 **Ethernet 2 MAC Address:** indicates the MAC Address of the "Data Out 1GigE" Port.
- 4 **Software Version:** indicates the software version of the unit.
- 5 **CPU Version:** indicates the current version
- 6 **MUX Version:** indicates the current version
- 7 **Unit Serial Number:** indicates the unit's serial number.
- 8 **Headend Name:** a user-defined field to make identification easier.
- 9 **Location:** another user-defined field to make identification easier.
- 10 **Login Timeout (Minutes):** indicates the period of time before the unit logs itself out if there is no activity on the web screens. Values are 5, 15, 30, or 60 minutes.

6.10 "Network" Screen (continued)

- 11 **Control Port IP Address:** See 10 of Section 6.11 for details.
- 12 **Control Port Subnet Mask:** See 11 of Section 6.11 for details.
- 13 **Control Port Default Gateway:** See 12 of Section 6.11 for details.
- 14 **EAS Port IP Address:** See 13 of section 6.11 for details
- 15 **EAS Port Subnet Mask:** See 14 of section 6.11 for details
- 16 **EAS Port default gateway:** See 15 of section 6.11 for details
- 17 **Gige Port IP Address:** See 16 of Section 6.11 for details.
- 18 **Event Log Destination:** See 20 of Section 6.11 for details.
- 19 **Log Destination Port #:** See 21 of Section 6.11 for details.



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

6.11 "Admin" 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 the Admin screen (Figure 6.11, next page).

- 1 **Login:** is the Administrator's login (10 characters maximum). This login allows the user to make changes to any area of the unit. Login is case sensitive. (Factory Default: "Admin")
- 2 **Current Password:** is the Administrator's Current Password (10 characters maximum). Password is case sensitive and will not be displayed. (Factory Default: "pass")
- 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. Login is case sensitive. (Factory Default: "Guest")
- 6 **Current Guest Password:** is the Current Guest Password (10 characters maximum). Password is case sensitive and will not be displayed. (Factory Default: "pass")
- 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 **System Watchdog:** automatically resets unit's Operating System if or when it is required. Options are Enabled and Disabled.

6.11 "Admin" Screen (continued)

AQT8-QAM/IP

ESN: 2014040600
Temperature: 100.6°F
Uptime: 0d 0h 20m 22s

Headend Name:
Location: eng'g test bench

Main
Network
Time
Event Log
Logout
Admin

Control Port MAC Address: 00:14:39:00:3F:FD
 EAS Port MAC Address: 00:14:39:00:3F:FE
 GigE Port MAC Address: 00:14:39:00:3F:FF
 Unit Serial Number: 2014040600

1 Login:

2 Current Password:

3 New Password:

4 Confirm New Password:

5 Guest Login:

6 Current Guest Password:

7 New Guest Password:

8 Confirm Guest Password:

9 System Watchdog:

10 Control Port DHCP:

11 Control Port IP Address:

12 Control Port Subnet Mask:

13 Control Port Default Gateway:

14 EAS Port IP Address:

15 EAS Port Subnet Mask:

16 EAS Port Default Gateway:

17 GigE Port IP Address:

18 GigE Port Subnet Mask:

19 GigE Port Default Gateway:

20 Event Log Destination:

21 Log Destination Port #:

22 Time Server IP:

EAS Group IP: 229.1.2.3
 EAS Group Port: 5000

23 Syslog Errors: Enabled Disabled

24 Syslog Informational: Enabled Disabled

25 Syslog Feedback: Enabled Disabled

26 Average Bit rate: Enabled Disabled

Figure 6.11 - "Admin" Screen

- 10 **Control Port DHCP Address:** User settings are "Static until DHCP" and "Static Only". This setting allows the user to define if the unit will use a DHCP server address (if available) or only the assigned (static) Control Port IP address. The default setting is "Static Only."



NOTE: The Static until DHCP setting is only required when using the unit along with a BT-HE-DASHBOARD headend controller.

6.11 "Admin" Screen (continued)

Using the "Static until DHCP" setting when the DASHBOARD is not being used may cause communications problems should a DHCP server ever be present on the IP control network.

In case the unit picks up a DHCP address and can no longer be communicated with because of an unknown IP address assigned, do the following:

1. Disconnect the unit from the IP network.
2. Reset the IP via the front panel button
3. Access unit via default IP address (172.16.70.1).
4. Go to Admin page and change Control Port DHCP to "Static".
5. Enter in a Control Port IP address based on network requirements.

- 11 Control Port 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. (Factory Default: 172.16.70.1)
- 12 Control Port 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. (Factory Default: 255.255.255.0)
- 13 Control Port Default Gateway:** is the gateway address of unit. It allows the user to access the unit from another network via the web interface. (Factory Default: 172.16.70.254)
- 14 EAS Port IP Address:** Is the static IP address assigned to the IP EAS Port. (Factory Default: 192.168.252.2)
- 15 EAS Port Subnet Mask:** is the subnet mask address of the IP EAS port. (Factory Default: 255.255.255.0)
- 16 EAS Port Default Gateway:** Is the gateway address of the IP EAS Port. (Factory Default: 192.168.252.254)
- 17 GigE Port IP Address:** is the static IP address assigned to the Gigabit Ethernet (GigE) port. (Factory Default: 192.168.253.1)
- 18 GigE Port Subnet Mask:** is the subnet mask address of the GigE port. (Factory Default: 255.255.255.0)
- 19 GigE Port Default Gateway:** Is the gateway address of the GigE Port. (Factory Default: 192.168.253.254)
- 20 Event Log Destination:** is the IP address of the remote server, to which Syslog sends the activities recorded by the unit for monitoring and troubleshooting purposes. (Factory Default: 172.16.70.2)
- 21 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. (Factory Default: 514 - unmodifiable)
- 22 Time Server IP:** is the IP address for the Time Server from where the unit can obtain its clock reference. See Section 6.1.2 for details. (Factory Default: 172.16.70.2)
- 23 Syslog Errors:** is to enable/disable forwarding error messages (in red font) to a Syslog. (Factory Default: Disabled)
- 24 Syslog Informational:** is to enable/disable the unit to forward information messages (in blue font) to a Syslog. (Factory Default: Disabled)
- 25 Syslog Feedback:** is to enable/disable the unit to forward feedback or confirmation messages (in green font) to a Syslog. (Factory Default: Disabled)
- 26 Average Bit Rate:** The factory default for this option is "Disabled". The "Enabled" setting should only be used when incorrect bitrate information is specified in the video header as received from the broadcaster. Incorrect declared bitrates from the broadcaster may cause overload/ buffer issues affecting the output TS. The "Enabled" setting allows the unit to assign an alternate bitrate instead of what's declared in the input TS.

Once Average Bit Rate is set to "Enabled", go to **15** in section 6.3 (p.22), and follow the instructions in order to complete enabling of this feature.



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

6.12 "Time" Screen

The "Time" screen (Figure 6.12) is a "read and write" screen where the following parameters are displayed or can be configured:

AQT8-QAM/IP					
ESN: 2014040600	Temperature: 99.4°F	Uptime: 0d 1h 14m 22s			
Headend Name:	Location:				
Main	Network	Time	Event Log	Logout	Admin
Current System Time		Fri Jun 16 15:47:38 2017			
Current Date (mm/dd/yyyy)	6 / 16 / 2017				
Current Time (24hr)	15 hrs : 47 min : 38 sec				
Configuration Method	<input checked="" type="radio"/> Manual <input type="radio"/> Automatic				
Automatically Adjust for Daylight Saving Time	<input type="radio"/> Yes <input checked="" type="radio"/> No				
DST Start Date (mm/dd/yyyy)	1 / 1 / 2013				
DST Start Time	1:00				
DST End Date (mm/dd/yyyy)	1 / 1 / 2013				
DST End Time	1:00				
<input type="button" value="Refresh"/> <input type="button" value="Save"/>					

Figure 6.12 - "Time" Screen

The "Time" screen allows the user to set the current date and time for the unit. 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" - the user must enter the IP address of the time server (see Section 6.11 for details).

The time server specified must support the Network Time Protocol (NTP) in order for automatic time acquisition to work properly. The unit would refresh the date and time settings from the Time server every 20 minutes. If, however, an internet connection is not available, the date and time can be entered manually. The unit is capable of adjusting the Day Light Saving (DST) time settings automatically, provided the "Automatically Adjust for Daylight Savings Time" in Figure 6.12 is selected "Yes".



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

6.13 "Event Log" Screen

The "Event Log" screen (Figure 6.13) 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 (Section 6.11 for details). The lines are color coded as follows:

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

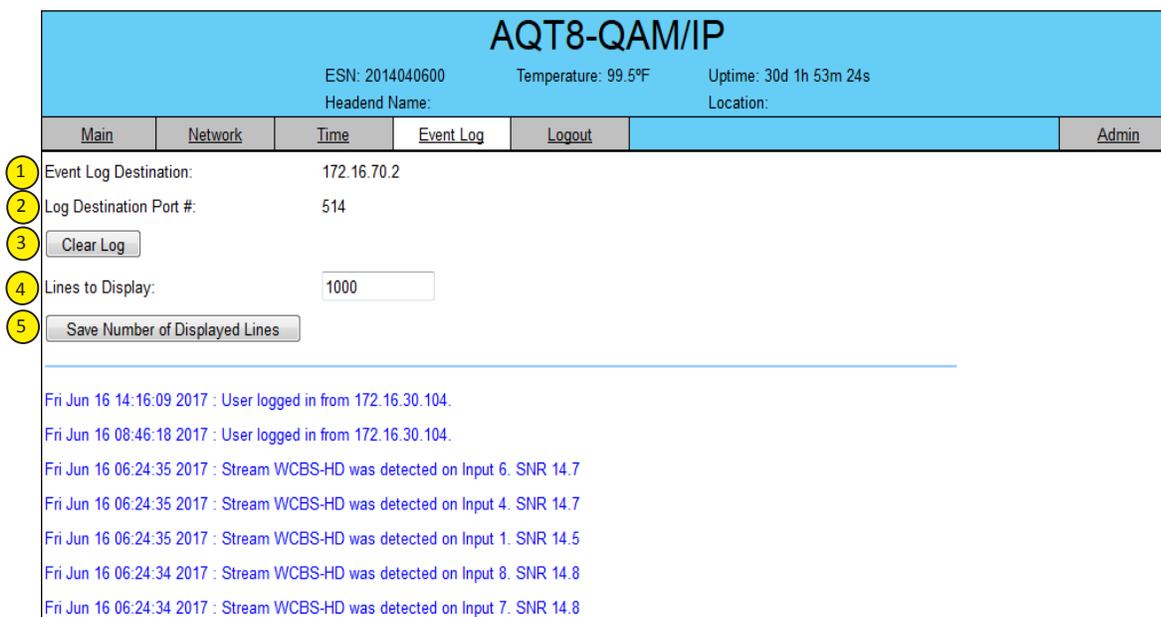


Figure 6.13 - "Event Log" Screen

- 1 **Event Log Destination:** see 20 of Section 6.11 for details.
- 2 **Log Destination Port:** see 21 of Section 6.11 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 number of displayed lines on the error log. 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 are two different PROMs that need to be programmed in the unit. 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 the unit.
- Step 2: a) Update PROM1 with the specific command line.
b) Update PROM2 with the specific command line.

Step 1 : FTP two Files to the Unit:

FTP both files (EPCS_1_ver#.bin and EPCS_2_ver#.bin) into the the unit's 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:

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
```

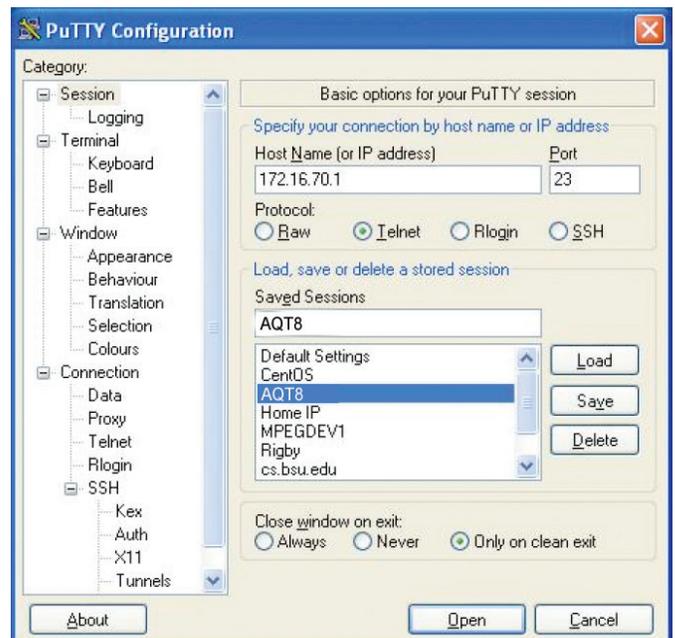
You can place the ftp command above in a batch file (.bat) then double click on the .bat file to perform the entire download process.

Telnet to the Unit:

There are two ways to telnet to the unit:

- (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.
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 the unit.

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 unit's Flash memory to be corrupted. The unit will try to reload the OS using the corrupted file ten (10) times before it displays the following screen. You can recover from this situation by repeating the procedure all over again from Step 1 above.

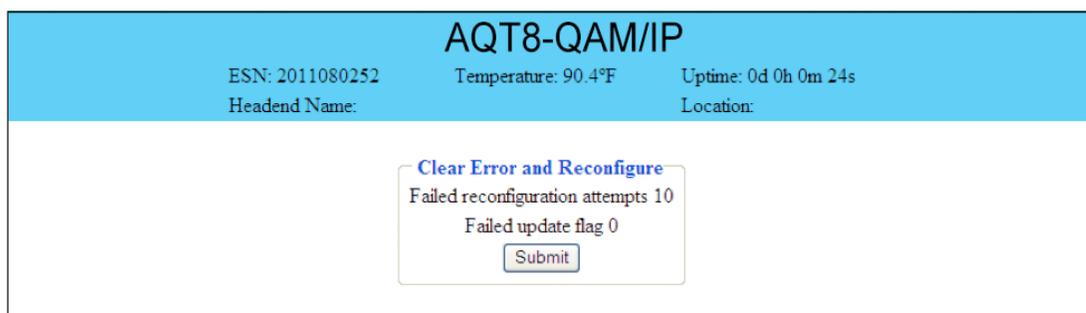


FIGURE 6.14

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: Both EPCS PROMS can be programmed concurrently using two different terminal sessions (logins). If you get errors during programming then **DO NOT TURN OFF THE UNIT**, just repeat the epcs commands again.

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

Two choices to reset the unit:

- (1) Unplug and reconnect power cable in the back of the unit.
- (2) Use Telnet and type "epcs -c" this will automatically reboot the unit without a need for resetting with power connector.

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

To view the IP output from the unit 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 Output Config” screen (see 3 of Section 6.5 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 Output Config” screen (see 3 of Section 6.5 for details and see Section 5 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” selected on the “Main > IP Output Config” screen (see 4 of Section 6.5 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 Output Config” screen (see 3 of Section 6.5 for details).

iv) Select Play.

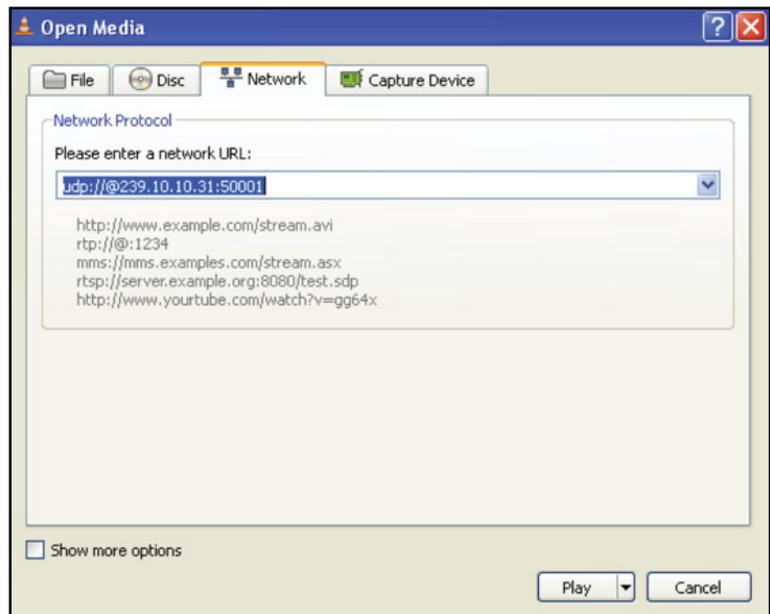


Figure 6.14 - VLC Media Player

Appendix C: Program Output Limitations

There is a firm twenty (20) program output limitation embedded in the AQT8-QAM/IP. However, during the setup, the message that displays AFTER the twenty (20) program limit has been reached is misleading. The message that appears in the dialog box is not a strong enough warning, and may lead the user to think that more than 20 programs can be done. This is not the case, as 20 output programs is the absolute limit.

What Happens if the Warning Message is Ignored?

If, after the twenty (20) program output limit has been reached, the user attempts to add what would be a 21st program, a warning dialog box will appear as follows:



If the user proceeds to add what seems like the 21st program (by pressing "OK"), that particular program will be added to the output program lineup, but at the same time the "last program" will be dropped so that only twenty (20) programs will be present at the output. The meaning of the term "last program" in this context means the last program (numerically) on the last IP output numerically (IP# 1-8). This means that transport stream packets of what was the last program in the program lineup, will be dropped and will no longer appear on IP output.

Another simple check is to observe the Status Page. The Status Page displays all the programs that have been entered by the operator. The user must add up all program entries (gray rows) assigned to each IP output 1-8 to determine the total number of programs. If there are more than twenty (20) programs on the Status Page, only the first twenty (20) reading from top to bottom on the Status Page) will be present at the IP Output.

Notes

Notes

Notes



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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 in directly 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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