



# QAM Modulator Module



Stock #	Model Name	Description
6785	NXG-32CH-QM	QAM Output Module - 32 Agile QAM Carriers

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

Purchase Location Name:	
Purchase Location Telephone Number:	
NXG-32CH-QM Module Serial Number:	

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

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This guide makes use of hyperlinks for the Table of Contents, some cross-reference linking between sections, and external hyperlinking to web addresses. This has been done to assist the reader in finding the information they are seeking in a much quicker way. In addition to hyperlinking, the Table of Contents also makes use of the bookmarking feature present in the Adobe Reader application.

### Product and Documentation Updates

Download the latest User Manual (PDF) by visiting our website. Navigate to the product page by entering the full Model Name or Stock Number in the search field. Upon reaching the product page, the "User Manual" download link will be located beneath the product image. **Firmware Updates** are available under "Tech Support" in the "Resources" section of the website. General instructions for the FTP site, as well as updating your firmware, are provided on this page.

### 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](http://www.blondertongue.com) for further information.

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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

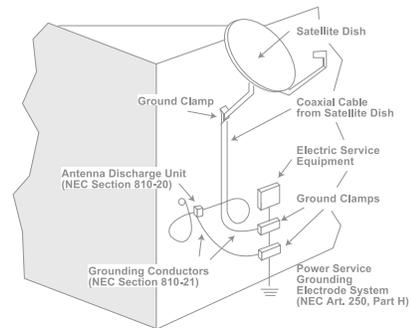
This reminder is provided to call the CATV System Installer’s attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.



**You should always follow these Instructions to help ensure Against injury to yourself and damage to your equipment.**

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature per Section 2.3.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- Read all safety and operating instructions before you operate the unit.
- Retain all safety and operating instructions for future reference.
- Heed all warnings on the unit and in the safety and operating instructions.
- Follow all installation, operating, and use instructions.
- Unplug the unit from the AC power outlet before cleaning. Use only a damp cloth for cleaning the exterior of the unit.
- Do not use accessories or attachments not recommended by Blonder Tongue, as they may cause hazards, and will void the warranty.
- Do not operate the unit in high-humidity areas, or expose it to water or moisture.
- Do not place the unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious personal injury and damage to the unit. Install the unit only in a mounting rack designed for 19” rack-mounted equipment.
- Do not block or cover slots and openings in the unit. These are provided for ventilation and protection from overheating. Never place the unit near or over a radiator or heat register. Do not place the unit in an enclosure such as a cabinet without proper ventilation. Do not mount equipment in the rack space directly above or below the unit.
- Operate the unit using only the type of power source indicated on the marking label. Unplug the unit power cord by gripping the plug, not the cord.
- The unit is equipped with a three-wire ground-type plug. This plug will fit only into a ground-type power outlet. If you are unable to insert the plug into the outlet, contact an electrician to replace the outlet. Do not defeat the safety purpose of the ground-type plug.
- Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, convenience receptacles, and the point where they exit from the unit.

- Be sure that the outdoor components of the antenna system are grounded in accordance with local, federal, and National Electrical Code (NEC) requirements. Pay special attention to NEC Sections 810 and 820. See the example shown in the following diagram:



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

## Section 2 – Product Summary

### 2.1 Revision History & Reason

This is the first release of this manual.

### 2.2 Product Application & Features

#### Application:

The **NXG-32CH-QM (QAM Modulator Module)** is part of the Blonder Tongue NeXgen Gateway (NXG) platform. The NXG-32CH-QM multi-channel QAM Modulator provides up to 32 QAM 256 channels. All 32 output channels are fully agile from 54 to 1002 MHz, with the requirement that all channels must be within a 768 MHz frequency span. Each program can be configured to support a customized channel lineup for desired locations.

#### Features:

- Provides reliable and secure HD programming in hospitality environments
- Can contain up to 3 audio streams and up to 11 additional PIDs for each video program
- Can be configured with both HD and SD programming in the same QAM channel
- Ability to change the PID, Program #, Short Name, Major and Minor channel (PSIP) information
- Provides fully independent QAM channels (no QAM channel blocks)
- Supports MPEG-2 and H.264 video
- Multiplexes SPTS programs to MPTS for QAM distribution
- Continuous Wave (CW) mode easily aligns headend level
- -20 dB RF test point

#### Description:

##### **a** STATUS LED:

LED is Off = Indicates the module is not correctly connected or receiving power.

LED is Green = Indicates the module is running without errors.

LED is Red = Indicates that one or more errors have been detected.

##### **b** QAM RF OUT: “F” connector used for combined QAM output.

##### **c** QAM RF TEST: “F” connector for RF testing -20dB referenced from the main output.



## 2.3 Module Specification

### Input

<b>Bandwidth:</b>	2.2 Gb input transport streams from the NXG Mainframe back plane
-------------------	--

### General

<b>Dimensions:</b> (W x D x H)	1.15" x 15.5" x 7.0" (29 mm x 394 mm x 178 mm)
<b>Power:</b>	Via NXG Mainframe back plane
<b>Power Consumption:</b>	32 W
<b>Weight:</b>	2.0 lbs (0.9 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
<b>Storage Temperature:</b>	-13 to 158 °F (-25 to 70 °C)
<b>Operating Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing
<b>Storage Humidity:</b>	0 to 95% RH @ 35 °C max, non-condensing

### Alarms/Monitoring

<b>Front Panel Indicator:</b>	1x Status LED
<b>Monitor Output:</b>	RF Out Test (-20 dB) connector

### Output

<b>Connector:</b>	1x "F" Female (Front-panel; for combined output)
<b>Modulation:</b>	QAM 256
<b>Standards:</b>	ITU-T J.83; Annex A and B
<b>DVB Symbol Rate:</b>	Variable; ; ≤ 7 MSymbol/sec (MBaud)
<b>Frequency Range:</b>	54 to 1002 MHz (all Ch.'s ≤ 768 MHz)
<b>Tuning:</b>	CATV Channel Selectable (Ch. 2 to 158)
<b>RF Level:</b>	+45 dBmV (per channel)
<b>Output Level Range:</b>	30 to 45 dBmV (all configured channels)
<b>Frequency Tolerance:</b>	± 0.5 kHz @ 77 °F (25 °C)
<b>Frequency Stability:</b>	± 5 kHz over 32 to 122 °F (0 to 50 °C)
<b>Amplitude Flatness:</b>	± 0.25 dB (over 6 MHz channel)
<b>Phase Noise:</b>	-98 dBc (@ 10 kHz)
<b>Spurious:</b>	-60 dBc
<b>Impedance:</b>	75 Ω
<b>Return Loss:</b>	14 dB typical
<b>Signal-to-Noise Ratio</b>	
(SNR):	40 dB typical
MER:	39 dB typical
<b>I/Q Phase Error:</b>	Less than 1 degree
<b>I/Q Amplitude Imbalance:</b>	Less than 1%

## 2.4 Module Installation

For general module installation instructions, please refer to the NXG Base Platform User Manual.

## Section 3 – Status

The “**Status**” tab (Figure 3) displays the general health and module information at a glance. The information is provided as a quick way to monitor the module or assist with troubleshooting issues that may arise.

Status	Streams	System	Time	Notification									Log	Firmwar
<b>Modules:</b> Slot 1 IP SPTS I/O (2) P:I IP (3) Slot 4 Slot 5 Slot 6 CableCARD (7) Slot 8 Slot 9 <b>32 QAM Out (10)</b> Slot 11 Slot 12														
<b>Module</b>		TS Map	TS Config	QAM Out	System									
<b>Module Status</b>														
Module Status										Ok				
MUX Status										Ok				
QAM Status										Ok				
Module Temperature										127.1 °F				
<b>Detected Issues</b>														
No issues detected														
<b>Module Information</b>														
Serial Number										2018050240				
Software Version										1.0.5.0				
Backplane Firmware Version										1.12				
Mux Firmware Version										1.8				
QAM Firmware Version										1.6				
Slot Location										5				

Figure 3 - “Module” Tab - Full View

### 3.1 Module Status

In the section entitled “**Module Status**” (Figure 3.1), the following parameters about the module health are displayed:

<b>Module Status</b>		
1	Module Status	Ok
2	MUX Status	Ok
3	QAM Status	Ok
4	Module Temperature	127.1 °F

Figure 3.1 - “Status” Tab - Module Status

- 1 **Module Status:** Indicates the current status of the module. Status Levels and colors shown below:
  - Ok** - No issues at the current time
  - Error** - One or more errors have occurred. A short summary of the error message is shown under “Detected Issues”. Check system log for more information on error(s).
- 2 **MUX Status:** Indicates the current status of MUX.
- 3 **QAM Status:** Indicates the current status of QAM.
- 4 **Temperature:** Indicates the temperature of the module.

### 3.2 Detected Issues

In the section entitled “**Detected Issues**”, the following module-specific information is indicated:

<b>Detected Issues</b>
No issues detected

Figure 3.2a - “Status” Tab - No Detected Issues

If any issues arise, the problem will be shown here and the color will correlate to the urgency of the issue. When there are no issues, the text will say “No issues detected” and remain black text color. When there is an Error, then the text will change to **red** and indicate what is causing the error (see Figure 3.2b)

<b>Detected Issues</b>
Module 6 - FXXHD_797 Program not detected in master streams list or is an invalid format.

Figure 3.2b - “Status” Tab - Error

### 3.3 Module Information

In the section entitled “**Module Information**”, the following module-specific information is shown below:

Module Information		
1	Serial Number	2018050240
2	Software Version	1.0.5.0
3	Backplane Firmware Version	1.12
4	Mux Firmware Version	1.8
5	QAM Firmware Version	1.6
6	Slot Location	5

**Figure 3.3 - “Status” Tab - Module Information**

- 1 Serial Number:** Indicates the serial number of the module installed.
- 2 Software Version:** Indicates the software version of the module. To update software, please see Section 8.
- 3 Backplane Firmware Version:** Indicates the backplane firmware version for this module. Backplane version is only needed for tech support and software debugging.
- 4 MUX Firmware Version:** Indicates the MUX firmware version of the module installed. This firmware version is only needed for tech support and software debugging.
- 5 QAM Firmware Version:** Indicates the QAM firmware version of the module installed. This firmware version is only needed for tech support and software debugging.
- 6 Slot Location:** Indicates the slot location on the platform chassis where the module is currently installed into.

## Section 4 – Transport Stream Map

The “TS (Transport Stream) Map” Tab (Figure 4.1) allows a user to select programs for QAM output.

**NOTE:** Clicking the small arrow (  collapsed;  expanded) beside each program will show or hide further choices or read-only data.

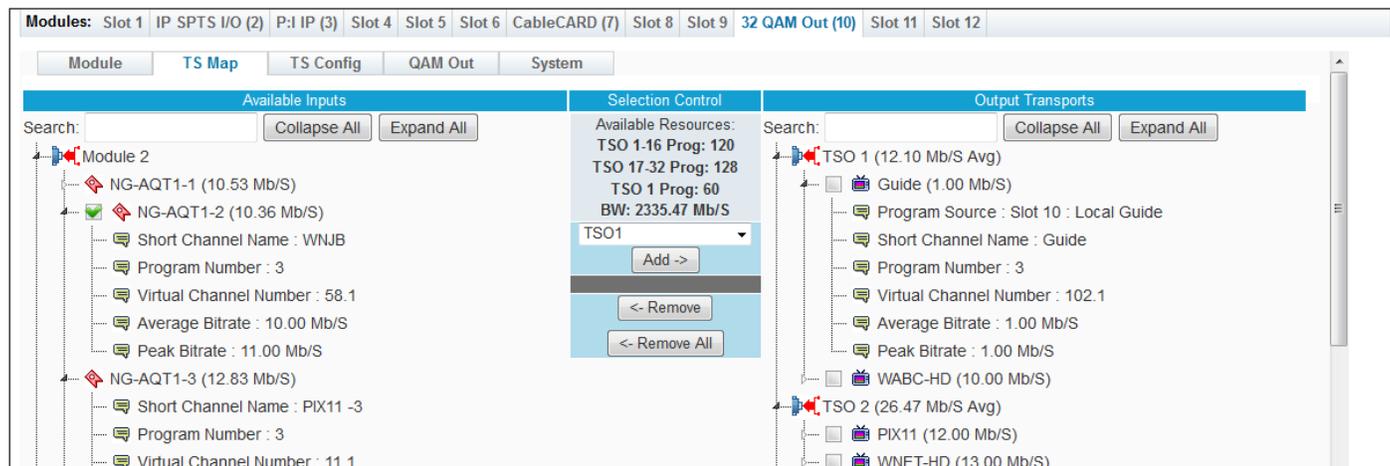


Figure 4.1 - “TS Map” Tab - Full View



**IMPORTANT:** The bandwidth transport stream should be no greater than 38.8 Mb/S.



**CAUTION:** Some programs may be statmuxed from the provider. Allow overhead in order to not exceed the maximum bitrate (38.8 Mb/S) for a QAM 256 channel.

### 4.1 Configuration Settings and Parameters

The “Available Inputs” column shows a list of all programs available on the NXG platform which can be added to the TS Map. The following read-only information is shown:

 **Module #:** Displays programs sourced from all input modules within the NXG platform. The Module 2 example used in Section 4 relates to “IP SPTS I/O (2)”, as shown at the top of Figure 4.1a.

 **Source Stream:** Displays the Source Stream Name and bandwidth (Mb/S). An empty checkbox (  ) can be checked (  ) to select one or more programs to be added to the Output Transports column.

When the line is expanded, the following data (  ) for each program is shown:

- 1 **Short Channel Name:** 7-letter name for the channel.
- 2 **Program Number:** Configures the MPEG Program used in all PSI tables for this stream. Range is 1 - 65,535.
- 3 **Virtual Channel Number:** Channel number assigned to a program within the Virtual Channel Table (VCT)

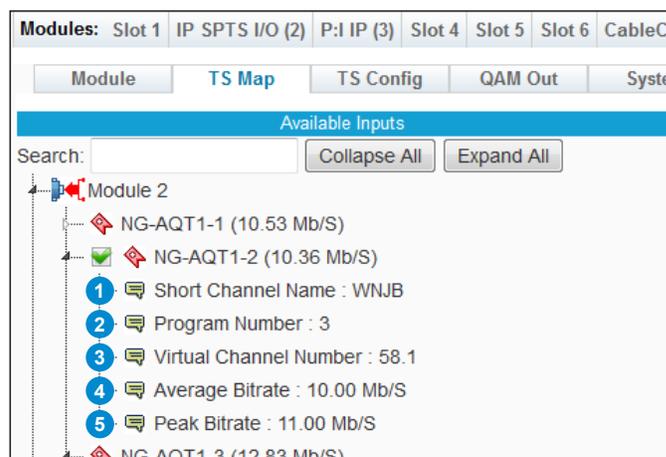


Figure 4.1a - Parameters - Available Inputs

### 4.1 Configuration Settings and Parameters (continued)

- 4 Average Bitrate:** The bitrate is calculated over a period of time to give you the average bitrate of that program. The “average bitrate” is a slightly low pass filtered sudo-running average to reduce rapid changes and is calculated as:

$$\text{current\_bitrate} = (\text{current\_bitrate} * 7 + \text{new\_value}) / 8$$

If the new value is zero then the current\_bitrate is also set to zero. Following zero the filter is preset to the current non-zero bitrate next read to speed along response time. If the stream bitrate was to radically jump (not typical) then the response time of the filter is 10 seconds for 80% and 20 seconds for 100% convergence.

- 5 Peak Bitrate:** The “peak bitrate” is the largest bitrate seen in the last 15 seconds. This is updated every 15 seconds.

The “Selection Control” column provides controls to “Add” and “Remove” programs from the TSO (Transport Stream Output) as well as the following read-only information:

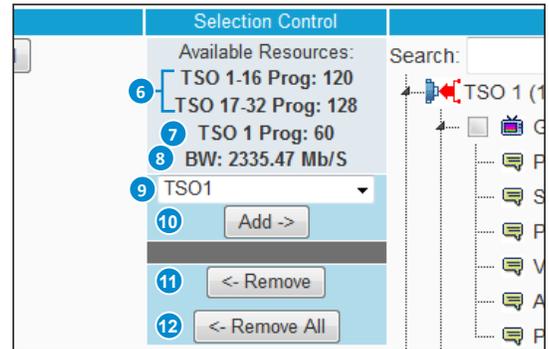


Figure 4.1b - Parameters - Selection Control

#### Available Resources

- 6 TSO 1-16 Prog and TSO 17-32 Prog:** These two lines indicate the sum-total number of programs that can be added to a group of transports and will count down as programs are added. Up to 128 programs can be assigned to TSO 1 – TSO 16, and up to 128 programs can be assigned to TSO 17 -TSO 32.
- 7 TSO # Prog:** Displays the available number of programs that may be added to the selected TSO. As each program is added, the number ticks downward.
- 8 BW (Bandwidth):** Displays the available bandwidth remaining for programs to be added to TSO 1 to TSO 32 combined.
- 9 TSO # Selection:** Allows the user to select which transport stream output number that they want to add one or more programs to.



**NOTE:** If there is any bandwidth available and a program has not yet been selected for encoding, a empty checkbox (  ) will show up beside the programs, under “Available Inputs”, which can fit within the available bandwidth.

- 10 Add ->** When one or more programs are selected from the “Available Inputs” column, pressing the Add button will immediately add the program(s) to the Output Transports column, indicating the program has been mapped to that TSO #. The output programs are then automatically available to the other modules for distribution.
- 11 <- Remove** When one or more programs are selected from the “Output Transports” column, pressing the Remove button will immediately remove the program(s) from the Output Transports column, indicating the program has been unmapped and removed from the TSO #.
- 12 <- Remove All** Pressing the “Remove All” button will remove **ALL** program(s) from the Output Transports column, indicating all programs have been unmapped and removed from the entire TS Map. A confirmation pop-up box will appear. Press “OK” to complete the process of removing all programs.

The “Output Transports” column shows a list of all programs that have been added to the TS Output. The following read-only information is shown:

- TSO # (Bandwidth):** Only programs which are being encoded will show up in this column.
- Stream Name:** Displays the Source Stream Name and bandwidth (Mb/S). An empty checkbox (  ) can be checked (  ) to select one or more programs to be removed from the Output Transports column.

When the line is expanded, the following data ( ) for each program is shown:

#### 4.1 Configuration Settings and Parameters (continued)

- 12 **Program Source:** Displays the module slot number that this program is being sourced from as well as the source stream name. Numbered modules correlate with what is currently installed and running in the NXG platform chassis.
- 13 **Short Channel Name:** 7-letter name for the channel.
- 14 **Program Number:** Configures the MPEG Program used in all PSI tables for this stream. Range is 1 - 65,535.
- 15 **Virtual Channel Number:** Channel number assigned to a program within the Virtual Channel Table (VCT)
- 16 **Average Bitrate:** The bitrate is calculated over a period of time to give you the average bitrate of that program.
- 17 **Peak Bitrate:** The peak bitrate is the largest bitrate seen in the last 15 seconds. This is updated every 15 seconds.

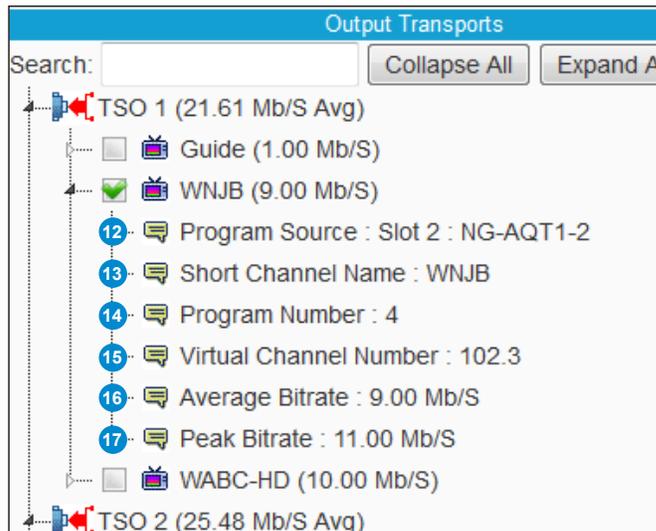


Figure 4.1b - Parameters - Output Transports

#### 4.2 Adding Programs to the Transport Stream Output

Within the “Available Inputs” column and under each numbered module, the user can locate the program(s) available for adding to a TSO under the “Output Transports” column.

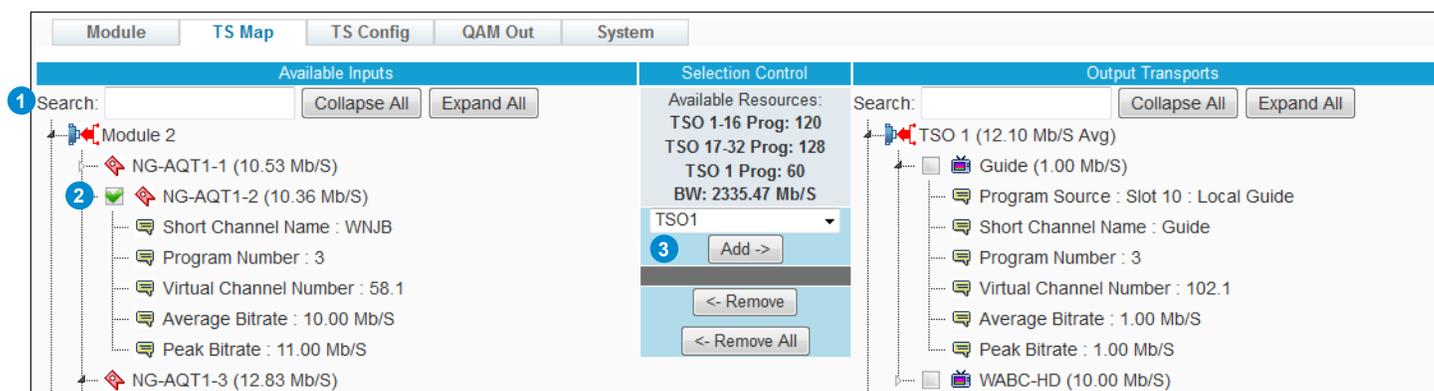


Figure 4.2 - “TS Map” Tab - Adding Programs

- 1 **Locating Program(s):** Each program can be located manually by clicking open the modules and the programs in order to view more in-depth information about each program. Additional controls at the top of “Available Inputs” are a Search field, if the user knows which program(s) they are intending to add to the Output Transports, and the Collapse All/Expand All buttons, allowing the user to see all information at once. This is especially useful when first setting up the Modulator Module.
- 2 **Choosing Program(s)** To add, locate the desired program and if it is available, check the empty box next to it.
- 3 **Adding Program(s):** From the pull-down menu, select which TSO # the chosen programs will be added to. Click “Add” and the program will be added to the “Output Transports” column for the selected TSO.

**NOTE:** An empty check box will always appear next to available programs. This check box will not appear next to a program under the “Available Inputs” column if a program has already been added to the “Output Transports” column.

### 4.3 Removing Programs from the Transport Stream Output

Within the “Output Transports” column, and under each numbered TSO, the user can locate the program(s) they wish to remove and make them selectable once again under the “Available Inputs” column.

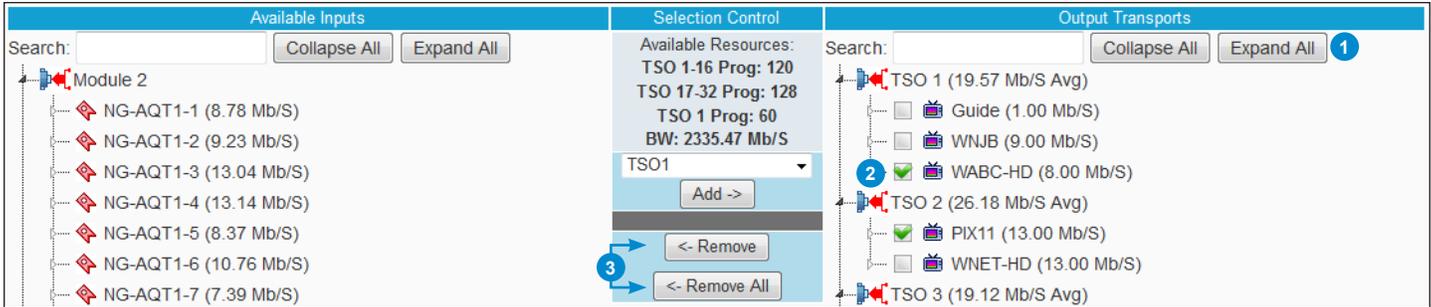


Figure 4.3 - “TS Map” Tab - Removing Programs

- 1 **Locating Program(s):** Each program can be manually located by clicking open the programs in order to view more in-depth information about each program. Additional controls at the top of “Output Transports” are a Search field, if the user knows which program(s) they intend to remove, and the **Collapse All/Expand All** buttons, allowing the user to see all information at once.
- 2 **Choosing Program(s):** To remove, locate the desired program and check the box next to the program to select.
- 3 **Removing Program(s):** Click “Remove” and the program will be made available once again within the “Available Inputs” column and removed from the “Output Transports” column. In addition, the user is able to click the “Remove All” button and clear out all programs from all Transport Stream Outputs. This is useful for starting over completely.

### 4.4 Search Function and Additional Controls

As previously pointed out in the prior sections, the search field and additional controls are provided for easier management and setup of the programs.

The “Search” function is provided as a way to easily find a program within a list. This standard function is real-time, acting as a filter to isolate matches as the user types into the input field.

The “Collapse All” and “Expand All” buttons are also provided, in addition to the search function, in order to further filter data.

An example of a numeric search is shown to the right. The filtered lines with the matching search terms will highlight in a **bold red-colored** text, while the rest of the programs will be hidden until the search input is cleared out or a new search is performed.

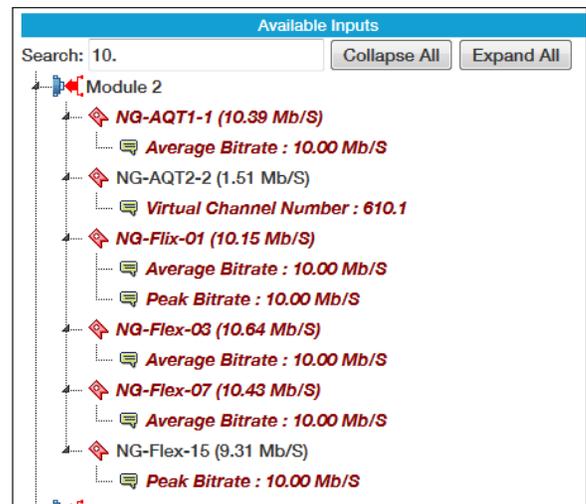


Figure 4.4 - Search and Additional Controls

## Section 5 – Transport Stream Configuration

The “TS (Transport Stream) Config” Tab (Figure 5.1) is a read and write screen which allows a user to assign TS parameters.

The screenshot shows the 'TS Config' interface. On the left is a tree view of TSOs (TSO 1 to TSO 17). On the right is the 'Transport Configuration' section, which is currently expanded to show 'Global Programs Relative PID Map' for TSO 1, TSO 2, and TSO 3. Each TSO configuration includes a 'Basic Configuration' section with fields for TS Name, TSID, and VCT, and a table of programs with columns for Program Source, Program Number, Short Name, Major Ch., and Minor Ch.

+ Global Programs Relative PID Map				
TSO 1		1	2	3
+ Basic Configuration		TS Name	TSID	VCT
Program Source		4	5	6
		Short Name	7	8
		Major Ch.		Minor Ch.
Module 7 - CBSHD_702		1	CBSHD	2
Module 7 - UNIHD_708		2	UNIHD	2

TSO 2		TS Name	TSID	VCT
+ Basic Configuration		TSO 2	2	CVCT
Program Source		Program Number	Short Name	Major Ch.
			Minor Ch.	
Module 7 - NBCHD_704		1	NBCHD	3
Module 7 - MSG+H_717		2	MSG+H	3
Module 5 - Local Guide		3	Guide	3

TSO 3		TS Name	TSID	VCT
+ Basic Configuration		TSO 3	3	CVCT
Program Source		Program Number	Short Name	Major Ch.
			Minor Ch.	
Module 7 - ABCHD_707		1	ABCHD	4
Module 7 - MSGHD_716		2	MSGHD	4
Module 7 - WFAHD_762		3	WFAHD	4

Figure 5.1 - “TS Config” Tab - Full View

### 5.1 Transport Configuration - Basic Configuration

The “Transport Configuration” column allows the user to set up and assign parameters within each TS Output. The module can be set up through either **Basic Configuration** or **Advanced Configuration**.

In **Basic Configuration** (Figure 5.1), the following parameters can be set:

- 1 **TS Name:** User-defined name for the Transport Stream Output.
- 2 **TSID:** user must enter the identification number for the output TS. The range is 1 to 65535. The TS ID assigned must be unique.
- 3 **VCT:** Virtual Channel Table (VCT) allows the user to choose from the following options:
  - CVCT: Cable Virtual Channel Table – 1-999
  - TVCT: Terrestrial Virtual Channel Table – 1-99
  - OFF: Turns off the VCT.
- 4 **Program Source:** Displays the module number that this channel is being sourced from as well as the source stream name. Numbered modules correlate with what is currently installed and running in the NXG platform chassis.
- 5 **Program Number:** user must enter a unique output program number for each program.
- 6 **Short Name:** user may enter a short name for the channel. Up to 7 alphanumeric characters are allowed.
- 7 **Major Ch.:** user may enter a major channel number for the output program. The range is 1 to 99 for Terrestrial and 1 to 999 for Cable.
- 8 **Minor Ch.:** user may enter a minor channel number for the output program. The range is 1 to 99 Terrestrial and 0 to 999 for Cable.

## 5.2 Transport Configuration - Advanced Configuration

To toggle into **Advanced Configuration** (Figure 5.2), click the plus sign ( **+** ) next to Basic Configuration. The additional following parameters will then be shown:

Slot 5					Slot 6					CableCARD (7)					Slot 8					Slot 9					32 QAM Out (10)					Slot 11					Slot 12				
QAM Out										System																													
Transport Configuration																																							
+ Global Programs Relative PID Map																																							
TSO 1										TS Name					TSID					VCT																			
- Advanced Configuration										TSO 1					1					CVCT																			
Program Source					Program Number					Short Name					Major Ch.					Minor Ch.																			
Module 7 - CBSHD_702					1					CBSHD					2					1																			
Module 7 - UNIHD_708					2					UNIHD					2					2																			
① Pgm PID Base					② Next Pgm PID Base					③ QAM Ch.					④ QAM Output																								
48					32					2					On																								
⑤ Input					⑥ Input PID					⑦ Output PID																													
PMT					48					48																													
V: MPEG-2					49					50																													
A: AC-3					52					51																													
A: AC-3					53					52																													
PMT					2078					80																													
V: MPEG-2					65					82																													
A: AC-3					68					83																													

Figure 5.2 - “TS Config” Tab - Full View

- 1 **Pgm PID Base:** The Program PID Base sets the first programs output PID number to this starting base number.
- 2 **Next Pgm PID Base:** The Next Program PID Base sets the next programs starting output PID number by incrementing this value higher than the previous program’s output PID number.
- 3 **QAM Ch.:** A read-only parameter indicating the QAM channel. This parameter is set under the “QAM Out” tab.
- 4 **QAM Output:** A read-only parameter indicating the QAM output status. This parameter is set under the “QAM Out” tab.

The following columns are used to display the PID numbers used for programs within the TS Output.

- 5 **Input:** Indicates the inputs that the PIDs are being assigned to.
- 6 **Input PID:** indicates automatically assigned PIDs for each input.
- 7 **Output PID:** indicates automatically assigned PIDs for each output.



**NOTE:** PIDs are automatically assigned and use the parameters set through 1 and 2 and when used, through “Global Programs Relative PID Map” (Section 5.4).

## 5.3 Transport Configuration - Output Transports

Within the **Output Transports** (Figure 5.3) column, the user is able to narrow down the Transport Stream Outputs viewable under the Transport Configuration column in order to isolate one or more specific streams to configure. This column is only used to filter and does not affect the configuration in any other way. The controls and parameters are as follows:

The “**Search**” function is provided as a way to easily find a program within a list. This standard function is real-time, acting as a filter to isolate matches as the user types into the input field. Use of “**Clear Search**” will wipe out the typed in words or numbers.

The “**Collapse All**” and “**Expand All**” buttons are also provided, in addition to the search function, in order to further filter data.

### 5.3 Transport Configuration - Output Transports (continued)

“Select All” and “Deselect All” will either fill in or remove the check from the boxes. The user can also manually check or uncheck any boxes they wish to show or hide from the list.

The “Output Transports” column shows a list of all programs have been added to the TS Output. The following read-only information is shown:

 **TSO #:** Only programs which are being encoded will show up in this column. A checkbox () can be unchecked () to select one or more TSOs to be removed from the column.

 **Stream Name:** Displays the Source Stream Name.

When the line is expanded, the following read-only data () for each program is shown:

- 1 **Program Source:** Displays the module number that this program is being sourced from as well as the source stream name. Numbered modules correlate with what is currently installed and running in the NXG platform chassis.
- 2 **Short Channel Name:** 7-letter name for the channel.
- 3 **Program Number:** Configures the MPEG Program used in all PSI tables for this stream. The program range is 1 - 65,535.
- 4 **Virtual Channel Number:** Channel number assigned to a program within the Virtual Channel Table (VCT).

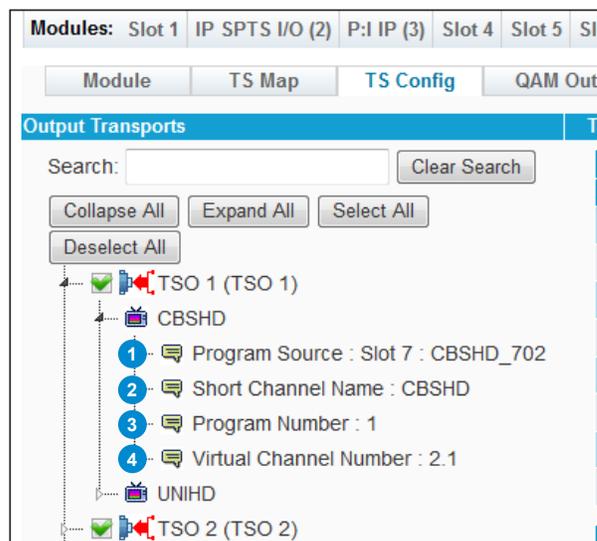


Figure 5.3 - “TS Config” Tab - Output Transports

### 5.4 Transport Configuration - Global Programs Relative PID Map

The **Global Programs Relative PID Map** (Figure 5.4), allows the user to offset the PID from the PMT. To open the Map, click the plus sign (+) next to the Map's title at the top of the **Transport Configuration** column section. The additional following parameters will then be shown:

Transport Configuration					
- Global Programs Relative PID Map					
1 Program Element	2 Relative Offset from PMT		Program Element	Relative Offset from PMT	
PCR (as needed)	1		Other 4	9	
Video 1	2		Other 5	10	
Audio 1	3		Other 6	11	
Audio 2	4		Other 7	12	
Audio 3	5		Other 8	13	
Other 1	6		Other 9	14	
Other 2	7		Other 10	15	
Other 3	8		Other 11	16	

Figure 5.4 - “TS Config” Tab - Transport Configuration - Global Programs Relative PID Map

- 1 **Program Element:** displays each program element that a PID gets assigned to.
- 2 **Relative Offset from PMT:** allows user to instruct the module to offset the assigned PID # relative to the PMT (Program Map Table).

## Section 6 – QAM Output

The “QAM Out” Tab (Figure 6) allows the user to configure the QAM Output parameters.

The screenshot displays the 'QAM Out' configuration interface. At the top, there are tabs for 'Module', 'TS Map', 'TS Config', 'QAM Out', and 'System'. Below these is the 'Global QAM Output Configuration' section, which includes:

- 1 QAM Map:** Set to 'STD'.
- 2 Modulation Mode:** Set to '256B'.
- 3 Baud Rate:** Set to '5360537' b/S.
- 4 Output Level:** Set to '45' dBmV.
- 5 Quick Mode Configuration:** Three buttons: 'Set all off', 'Set all CW', and 'Set all on'.

Below these settings is a table with 32 rows, each representing a Transport Stream Output (TSO) channel. The table has columns for ID, Channel, Mode, Guide Listing, and Status. All channels are currently set to 'On' mode, 'Enabled' guide listing, and 'Ok' status.

ID	Channel	Mode	Guide Listing	Status
TSO 1	2 ( 57 MHz)	On	Enabled	Ok
TSO 2	3 ( 63 MHz)	On	Enabled	Ok
TSO 3	4 ( 69 MHz)	On	Enabled	Ok
TSO 4	5 ( 79 MHz)	On	Enabled	Ok
TSO 5	6 ( 85 MHz)	On	Enabled	Ok
TSO 6	7 (177 MHz)	On	Enabled	Ok
TSO 7	8 (183 MHz)	On	Enabled	Ok
TSO 8	9 (189 MHz)	On	Enabled	Ok
TSO 9	10 (195 MHz)	On	Enabled	Ok
TSO 10	11 (201 MHz)	On	Enabled	Ok
TSO 11	12 (207 MHz)	On	Enabled	Ok
TSO 12	13 (213 MHz)	On	Enabled	Ok
TSO 13	14 (123 MHz)	On	Enabled	Ok
TSO 14	15 (129 MHz)	On	Enabled	Ok
TSO 15	16 (135 MHz)	On	Enabled	Ok
TSO 16	17 (141 MHz)	On	Enabled	Ok
TSO 17	18 (147 MHz)	On	Enabled	Ok
TSO 18	19 (153 MHz)	On	Enabled	Ok
TSO 19	20 (159 MHz)	On	Enabled	Ok
TSO 20	21 (165 MHz)	On	Enabled	Ok
TSO 21	22 (171 MHz)	On	Enabled	Ok
TSO 22	23 (219 MHz)	On	Enabled	Ok
TSO 23	24 (225 MHz)	On	Enabled	Ok
TSO 24	25 (231 MHz)	On	Enabled	Ok
TSO 25	26 (237 MHz)	On	Enabled	Ok
TSO 26	27 (243 MHz)	On	Enabled	Ok
TSO 27	28 (249 MHz)	On	Enabled	Ok
TSO 28	29 (255 MHz)	On	Enabled	Ok
TSO 29	30 (261 MHz)	On	Enabled	Ok
TSO 30	31 (267 MHz)	On	Enabled	Ok
TSO 31	32 (273 MHz)	On	Enabled	Ok
TSO 32	33 (279 MHz)	On	Enabled	Ok

A 'Save' button is located at the bottom center of the configuration area.

Figure 6 - “QAM Out” Tab - Full View

### 6.1 Global QAM Output Configuration

- 1 QAM Map:** allows user to select desired QAM Map (channel/frequency plan). Options are “STD”, “IRC”, and “HRC”.
- 2 Modulation Mode:** allows user to select 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.
- 3 Baud Rate:** indicates the maximum data rate depending on the selected QAM mode, for example 5.360537 Mbaud for QAM 256B.
- 4 Output Level:** allows user to select the level for the QAM RF output. The range is 30 to 45 dBmV. It is recommended to maintain the output level at 45 dBmV for normal operation.
- 5 Quick Mode Configuration:** when clicked, each of the 3 buttons will set all channels to one of 3 options: “Set all Off”, “Set all CW”, or “Set all On”. See “Mode” in Section 6.2 (below) for more information.

### 6.2 Transport Stream Output Channel Settings

- 6 ID:** Transport Stream Output Number
- 7 Channel:** User must assign an RF channel number to the RF QAM output of the module. The range is NTSC channels 2 to 158. All 32 assigned channels must be within a 768 MHz frequency span.
- 8 Mode:** allows the user to configure each channel to one of the following:
  - **On:** Switches the channel On.
  - **CW:** Switches the channel to CW (Continuous Wave). This activates an analog carrier at the selected channel’s center frequency comparable to the digital QAM output level. It is typically only used in level adjustment of the system when an analog signal level meter is available to measure the encoder’s output level during installation and servicing. **Note:** User should always leave QAM “On” for normal operation after CW mode.
  - **Off:** Switches the channel Off.

## 6.2 Transport Stream Output Channel Settings (continued)

- 9 **Guide Listing:** Enable or Disable the channel to the basic guide listing.
- 10 **Status:** Indicates the status of the TS Output channel.



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

The **Guide Listing** can provide a very basic channel name and channel number as a local guide.

Please note that this does not include any guide data and should only be used when there is no EPG available. In order to get the complete Guide data, the user must refer to the NXG-EPG module.

The channel number and name will match the TS Config page sequence. See the example view of an enabled **Guide Listing** below:

Channel Lineup							
28-2	PIX11	30-2	aqt411	32-1	Antenna	33-2	aqt335
28-3	Antenna	30-3	aqt414	32-2	aqt333	33-3	LivWell
28-4	ThisTV	31-1	TBD	32-3	aqt334	33-4	LAFF
28-5	TBD	31-2	Antenna	32-4	aqt335	33-5	aqt441
28-6	WABC-HD	31-3	LAFF	32-5		33-6	aqt442
29-1	PIX11	31-4	aqt324	32-6			
29-2	WABC-HD	31-5	aqt443	32-7			
29-3	aqt341	31-6	ThisTV	32-8			
29-4	KIDS	31-7	WNJB.2	32-9			
30-1	LivWell	31-8	aqt533	33-1	aqt333		

## Section 7 – System

The “System” Tab allows the user to manage the module configuration through the following controls:

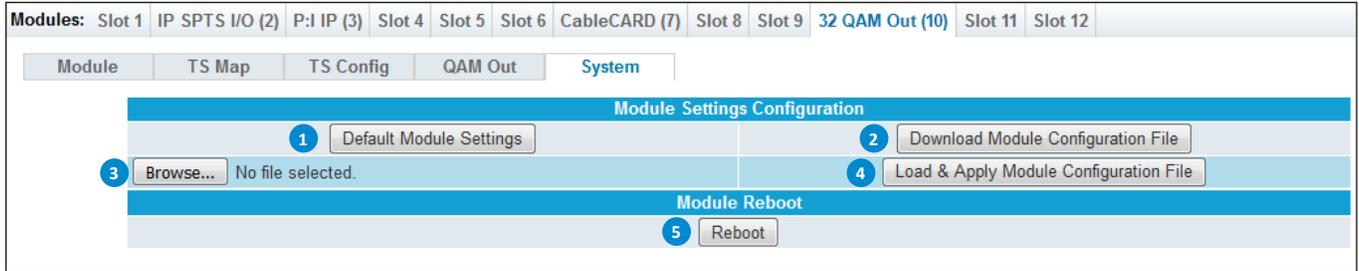


Figure 7 - “System” Tab

### 7.1 Module Settings Configuration

The “Module Settings Configuration” section allows the user to back-up and re-load the configuration settings.

- 1  Resets the module back to the Factory defaults. It is always recommended to save the existing configuration file before resetting to the default values .
- 2  Downloads the current module configuration file.
- 3  No file selected. Browse and select a Configuration File.
- 4  After choosing file, click this to load and apply the configuration file.

### 7.2 Module Reboot

The “Module Reboot” section allows the user to reboot the module from this screen.

- 5  Click this button to reboot the module.

## Section 8 – Firmware Updates

The “Firmware Update” tab (Figures 8a, 8b, 8c, and 8d) is part of the Master Controller Module interface, and is used for all installed modules. It is located on the right side of the main menu allowing the user to review currently installed firmware versions and provides a quick and easy way to apply any new updates.

The screenshot shows the 'Firmware Update' tab interface. At the top, there are navigation tabs: Status, Streams, System, Time, Notification, Log, and Firmware Update. Below these are module categories: CableCARD (1), CableCARD (2), IP MPTS In (3), IP SPTS I/O (4), Slot 5, EPG (6), EAS Proc (7), Slot 8, P:I IP (9), P:I QAM (10), Slot 11, and 32 QAM Out (12). The main content area is divided into two sections: 'Firmware Update Files' and 'Firmware Update Control and Status'. The 'Firmware Update Files' section has a 'Browse...' button and an 'Upload File' button. The 'Firmware Update Control and Status' section is a table with columns for Module, Firmware Version, Update Control, and Status.

Module	Firmware Version	Update Control	Status
Master Controller (NXG-CNTRL)	1.0.2.0_20181022	Update	
24 Prog CableCARD In (NXG-CCQD-24)	1.0.0.0_20181106	Update	
24 Prog CableCARD In (NXG-CCQD-24)	1.0.0.0_20181106	Update	
IP MPTS In (NXG-IP-MPTS)	1.0.1.0	Update	
IP SPTS In/Out (NXG-IP)	1.0.3.0	Update	

Figure 8a - “Firmware Update” Tab

- 1 Check “Firmware Version” to ensure you have the latest firmware. To determine if a new firmware update has been released, please go to our website at: ([www.blondertongue.com/page/resources/tech-support/firmware-updates/](http://www.blondertongue.com/page/resources/tech-support/firmware-updates/))

Click the “Download Firmware Updates” link and then scroll down to the “NeXgen Gateway” folder to view the NXG module folders.

**Note:** There is a check of the file name versus module ID to eliminate a user inadvertently updating any modules with incorrect files. Multiple module updates can be performed simultaneously after uploading the files.

- 2 Under the “Firmware Update Files” section, the user can use  and  to select and send the module update file(s) into the NXG Platform. See a view of the file when uploaded to the platform as shown below on Figure 8b.

The screenshot shows the 'Firmware Update Files' section with a 'Browse...' button and an 'Upload File' button. A file named 'NXG-32CH-QM Update File' is shown with a version of '1.0.6.4 20181024' and a close button (X).

Figure 8b - File when uploaded

- 3 Update the Firmware version by clicking the  button. The update status and progress will show under the “Status” columns. Below are the firmware updates as they appear while in-progress (Figure 8c) and upon completion (Figure 8d). After the update is complete, the user **MUST** reboot the module to finish applying the updates.

**Note:** After clicking the “Update” button, please allow a few seconds for the file to load.

The screenshot shows the 'Firmware Update Control and Status' table. The row for '32Ch QAM Modulator (NXG-32CH-QM)' shows a firmware version of '1.0.6.4', an 'Update' button, and a status of 'Updating System Files' with a progress bar.

Figure 8c - Update In Progress

- 4 Once the update progress is complete, the user **MUST** click the  button (as shown on Figure 8d) in order to apply and finalize the update.

The screenshot shows the 'Firmware Update Control and Status' table. The row for '32Ch QAM Modulator (NXG-32CH-QM)' shows a firmware version of '1.0.6.4', a 'Reboot' button, and a status of 'Update Complete' with a green progress bar.

Figure 8d - Completed Update



When firmware updates are complete, the user can remove the loaded file by clicking the  button shown on Figure 8b next to the “Upload File” button under “Firmware Update Files”.

## **Section 9 – Troubleshooting**

For technical support please contact us at 1-800-523-6049 between the hours of 8am and 5pm EST.





# 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 1<sup>st</sup> 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 one (1) year 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 1021)



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