Digital Products

- Agile QAM Modulator
- Digital HDTV Processors
- QAM Transcoders
- Headend Web Server
- Headend Distribution Amplifiers
- Modular QPSK to QAM Transcoders
- Digital QAM Upconverter
- QAM Digital Entertainment Receiver
Digital Products Overview

Digital Products continue to expand in the cable marketplace and bring more advanced technology to consumers and operators. Blonder Tongue is constantly expanding the Digital Products offering and includes a complete line of Transcoders for economically deploying and adding a digital programming tier to systems, Digital QAM Upconverters for data over cable applications and Digital High Definition Television Processors for delivery of HDTV programming.

The Transcoder family consists of 2 main product lines, the MQQT Series and QT Series. Both are intended to allow a cable television operator the ability to add a digital tier of over approximately 200 channels at a fraction of the cost of a traditional digital cable headend. The Transcoder philosophy utilizes existing satellite delivered programming & authorization infrastructure to offer the operator the easiest possible digital cable solution. The entire Blonder Tongue family of transcoders is extremely simple to deploy and operate and feature the ability for remote computer control as well as redundant stand-by powering capability. The Modular QPSK to QAM Transcoder Series is intended for use with the HITS & Motorola based DigiCipher® II technology. The QAM Transcoder Series is intended for use with Dish™ Commercial TV from EchoStar. The brief comparison table describes the key differences.

Also featured is the DQX, Digital QAM Upconverter, a high performance digital upconverter designed for data over cable and video on demand applications. It is a fully modular unit capable of housing up to 4 upconverter module units in a single rack height chassis. Simple LCD based programming, digital output level control, and stand-by power are all built in making the DQX the market leader.

The newest addition to the Digital Products line is the Agile QAM Modulator or AQM. The AQM integrates an advanced QAM modulator with an exceptionally low noise upconverter with optimized output stability. The QAM modulator utilizes the latest integrated circuit technology to support common symbol constellations of 64 and 256 QAM, as well as next generation technology of 512 & 1024 QAM. It is the first commercially available QAM modulator in the market to support 1024-QAM. It uses the standard Blonder Tongue micro-modular rack chassis and power supply, allowing it to coexist with existing equipment.

### Transcoder Product Comparison

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<th>MQQT Series</th>
<th>QT Series</th>
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<tr>
<td>Rack Space</td>
<td>8 modules in 3 RU</td>
<td>4 modules in 1 RU</td>
</tr>
<tr>
<td>Output Level</td>
<td>+40 dBmV</td>
<td>+50 dBmV</td>
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<tr>
<td>Phase Noise (@10 kHz)</td>
<td>-90 dBC to -97 dBC</td>
<td>-95 dBC</td>
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<tr>
<td>MER</td>
<td>38 to 43 dB</td>
<td>38 to 41 dB</td>
</tr>
<tr>
<td>EAS Capable</td>
<td>No</td>
<td>Yes - Auto Switching</td>
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<tr>
<td>Design Default</td>
<td>Echostar, DigiCipher II Capable</td>
<td>DigiCipher II, Echostar Capable</td>
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<tr>
<td>Computer Control Capable</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Standby Power Support</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>LCD Tuning Interface</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>256 QAM Capable</td>
<td>✔ (Optional upgrade)</td>
<td>✔ (Optional upgrade)</td>
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<tr>
<td>Optional Integrated</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Splitter/Combiner</td>
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</table>
**Digital Products Overview**

- **Application Diagram - MQQT Series**

- **Application Diagram - QT Series**
The AQM is designed to accept an MPEG-2 ASI (Asynchronous Serial Interface) digital transport stream and modulate it into a QAM (Quadrature Amplitude Modulation) signal. The QAM modulator in the AQM achieves state-of-the-art performance with capabilities to improve bandwidth efficiency by supporting advanced QAM modes like 256, 512 & 1024 QAM. The built-in advanced bit stuffing circuitry ensures that Null Packets are inserted into the ASI transport stream if needed to ensure the correct baud rate is transmitted.

Excellent RF performance is vital to the health of every cable system. Incorporating digital signals into that cable system increases the complexity required to keep it operating smoothly. The AQM’s integrated upconverter is designed to accomplish this very goal. The BT Agile QAM Modulator incorporates a custom design approach utilizing the latest generation technology available to ensure extremely low phase noise and a highly stable output signal. This eliminates the hassles and potential for problems caused by module based interconnects, especially when using products without integrated upconverters.

The AQM is easily accommodated in Blonder Tongue's standard HE Series of micro-modular rack chassis units and MIPS power supply units. This allows existing modulators or demodulators to coexist effortlessly.

### Features & Benefits
- AQM Unit Integrates the QAM Modulator and a High Performance Upconverter
- Compact Design allows 6 Modules in a 2 RU Rack Chassis
- DVB MPEG-2 ASI Input, Complies with DVB ASI Standards
- Improve Bandwidth Efficiency with Support for All Advanced QAM Modes including 512 & 1024 QAM
- RF QAM Output Channel 2—135 (54—860 MHz)
- Self Test PRBS Mode Built In
- Optional IF Output Available via Special Order
- Optional LVDS Input Available via Special Order

### Specifications

**QAM Modulator**
- QAM Modulation Modes: 16, 32, 64, 128, 256, 512 & 1024 QAM
- Symbol Rate: Variable, up to 10 Mbaud
- Input: ASI (Asynchronous Serial Interface per EN 50083-9)
- LVDS Parallel Input Option Available (Low Voltage Differential Signaling)
- FEC Encoder: Complies with ITU-T J.83 Standards, Annex A (DVB) & Annex B (DigiCipher® & OpenCable/DOCSIS)
- Spectral Inversion: Auto Recognition
- Carrier Suppression: 55 dB
- MER: 40 dB
- I/Q Phase Error: <1 degree
- I/Q Amplitude Imbalance: <1 %

**RF Output**
- Channel Range: 2 to 135
- Frequency Range: 54-864 MHz
- Frequency Step: 6 MHz (Channel Center)
- Frequency Stability: ±5 kHz
- Output Level: +40 dBmV
- Output Level Control Range: 10 dB
- Amplitude Flatness: ±0.25 dB (over 6 MHz CH)
- Output Impedance: 75 Ohm
- Phase Noise @ 10 kHz Offset: -98 dBc/Hz
- Spurious (54-1000 MHz): -60 dBc/Hz
- Broadband Noise: -77 dBc (@ +40 dBmV Output, 4 MHz BW)

**Controls & Connectors**
- Liquid Crystal Display (LCD): 5 Interactive Navigation/Enter Push Buttons
- ASI Input: BNC 75 Ohm
- RF Output: ‘F’ type Female
- Power Headers: 3 Pin +5/+12 VDC

**General**
- Power Requirements:
  - Voltage: +5 / + 12
  - Power (Max): 9 W
- Operating Temperature Range: 0 to +50° C
- Humidity: 0 to 90 % RH

**Mechanical**
- Dimensions:
  - 2.3 x 3.5 x 7.50 Inches
  - 58 x 89 x 191mm
- Weight: 2.3 lbs.

### Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Stock No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>AQM</td>
<td>6271</td>
<td>Agile QAM Modulator (Consult Factory for Optional LVDS Input &amp; IF Output versions)</td>
</tr>
</tbody>
</table>

**Accessories**
- MIPS12C 7722C Power Supply
- MIRC-12V 7715 Chassis

www.blondertongue.com  •  800-523-6049
The DHDP Series is a two-unit system consisting of a Downconverter unit which acts as the input section and an Upconverter unit which acts as the output section. Both units are housed in a single MICM style die-cast chassis and are available in both horizontal and vertical versions.

The Downconverter unit is designed to accept any 8VSB signal from 54-860 MHz. Channel entry is made using a 2 digit front panel accessible BCD switch. (I.E. - VHF 2-13, UHF 14-69 & unused spectrum 806-860 MHz). The Downconverter outputs an IF signal which is fed to the Upconverter unit.

The Upconverter unit is designed to take the IF signal from the downconverter and process it to any channel from 54-860 MHz. Channel entry is made using a 2 digit front panel accessible BCD switch. (I.E. - CATV – STD, IRC & HRC as well as Broadcast VHF & UHF).

- **Features & Benefits**
  - Digital & High Definition Capable
  - MICM Form Factor – Vertical & Horizontal Versions
  - 54-860 MHz 8VSB Input
  - 54-860 MHz CATV Output
  - Excellent Noise Performance - 88 dBC @ 10 kHz & 98 dBC @ 20 kHz
  - +40 dBmV Digital Output Level (+45 dBmV Analog Signals)
**Specifications**

**DOWNCONVERTER**

**RF**
- Input Frequency Range: (8VSB)
  - VHF 2-13: 54-216
  - UHF 14-69: 470-806
  - UHF Extended: 806-860
- Operating Input Range: -10 dBmV to +20 dBmV
- Input Level Range:
  - (AGC Controlled) -20 dBmV to +25 dBmV
  - Adj. Ch. Rejection: (Ref. to +30 dBmV IF output)
    - Adj. Aural and Below: >65 dB
    - Adj. Visual and Above: >65 dB
- Output Frequency: 44.00 MHz IF
- Output Level: +30 dBmV (-20 dBmV to +25 dBmV Input)
- L.O. Leakage on RF Input Port: -50 dBmV
- Phase Noise: @ 10 KHz Offset -85 dBc/Hz

**General**
- Power Requirements:
  - +12 VDC: 120 mA
  - +5 VDC: 160 mA
- Operating Temperature Range: 0 to +50 ºC

**Mechanical**
- Dimensions (W x H x D): 1.15 x 3.5 x 7.5 in.
  - 29 x 89 x 101 mm
- Weight: 0.8 lbs (36 kg)
- Connectors (Rear Panel): RF Input: “F” Type, Female
  - IF Output: “F” Type, Female
  - Power: 3 Pin Polarized Receptacle
- Controls (Front Panel):
  - Channel Selection: 2 Digit Push Button
  - Channel Enter: Push Button
- Indicators (Front Panel):
  - Power ON/Status OK: 2 Color LED/Green
  - Status/ Error: 2 Color LED/Red

**UPCONVERTER**

**RF**
- Output Frequency Range: 54-860 MHz
- Channels: CATV: STD, IRC, HRC
  - Broadcast: VHF, UHF
- Output Frequency Tolerance: ±5 kHz
- Output Level:
  - Analog: +45 dBmV (IF Input +35 dBmV)
  - Digital: +40 dBmV (IF Input +30dBmV)
- Output Level Adj. Range: 10 dB
- Channel Flatness: 1 dB
- Spurious Output 50-1000 MHz: -60 dB
- C/N Ratio IN Channel:
  - Digital: -60 dB
  - (6 MHz BW +40 dBmV Output)
  - Analog: -65 dB
  - (4 MHz BW +45 dBmV Output)
- Broadband Noise: -76 dBc
  - (4 MHz BW +45 dBmV Output)
- Phase Noise: @ 10 KHz Offset -88 dBc
  - @ 20 KHz Offset -98 dBc
- Output Impedance: 75
- Output Return Loss: 12 dB

**General**
- Power Requirements:
  - +12 VDC: 140 mA
  - +5 VDC: 300 mA
- Power: 3.2 W
- Operating Temperature Range: 0 to +50 ºC

**Mechanical**
- Dimensions (W x H x D): 1.15 x 3.5 x 7.5 in.
  - 29 x 89 x 101 mm
- Weight: 0.8 lbs (36 kg)
- Connectors (Rear Panel):
  - RF Input: “F” Type, Female
  - IF Output: “F” Type, Female
- Controls (Front Panel):
  - RF Output Level: Control
- Indicators (Front Panel):
  - Power ON/ Status OK: 2 Color LED/Green
  - Status/ Error: 2 Color LED/Red

**Ordering Information**

**Units**

<table>
<thead>
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<th>Model</th>
<th>Stock No.</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>DHDP-V</td>
<td>6266</td>
<td>Digital &amp; High Definition Processor Vertical Combo 54-860 MHz 8VSB Downconverter, 54-860 MHz Upconverter</td>
</tr>
<tr>
<td>DHDC-UV</td>
<td>6265</td>
<td>Digital &amp; High Definition Processor Upconverter 54-860 MHz CATV Output</td>
</tr>
<tr>
<td>DHDC-DV</td>
<td>6264</td>
<td>Digital &amp; High Definition Processor Downconverter 54-860 MHz 8VSB Input</td>
</tr>
<tr>
<td>DHDP-H</td>
<td>6263</td>
<td>Digital &amp; High Definition Processor Horizontal Combo 54-860 MHz 8VSB Downconverter, 54-860 MHz Upconverter</td>
</tr>
<tr>
<td>DHDC-UH</td>
<td>6262</td>
<td>Digital &amp; High Definition Processor Upconverter 54-860 MHz CATV Output</td>
</tr>
<tr>
<td>DHDC-DH</td>
<td>6261</td>
<td>Digital &amp; High Definition Processor Downconverter 54-860 MHz 8VSB Input</td>
</tr>
<tr>
<td>DHDP-50</td>
<td>6260</td>
<td>Digital &amp; High Definition Processor 1 RU Fully Integrated Unit, +50 dBmV Output</td>
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**Accessories**

<table>
<thead>
<tr>
<th>Model</th>
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<th>Description</th>
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<tbody>
<tr>
<td>MIRC-4C</td>
<td>7710</td>
<td>HE-4 Series Rack Chassis &amp; Power Supply 19” Rack Mount 4 Slot Horizontal Chassis w/ Power Supply</td>
</tr>
<tr>
<td>MIPS-12C</td>
<td>7722C</td>
<td>HE-12 Series Power Supply 5.5 A on 5 VDC line, 4 A on 12 VDC line</td>
</tr>
<tr>
<td>MIRC-12V</td>
<td>7715</td>
<td>HE-12 Series Vented Rack Chassis 19” Rack Mountable 2 RU chassis for 12 modular units</td>
</tr>
</tbody>
</table>

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The QT Series is the latest Blonder Tongue Transcoder product and it features the ultimate combination of optimum balance of price per channel and top notch performance and functionality. This new unit incorporates a scalable modular design that allows from one to eight transcoder module sections as well as a single combination power supply & control module to be added, removed or swapped at any time. Support for redundant back-up or ‘standby’ power has been built into every QT power supply & control module. This ability is easily added by an operator at any time by interfacing an optional standby power supply unit. The QT Series also has the ability to easily accommodate advances such as 8PSK decoding and 256 QAM processing via a specially designed optional QAM Transcoder Module (QTM-HD).

Each QT Chassis can contain up to eight (8) separate QPSK to QAM transcoder modules. Each QAM Transcoder Module (QTM) is fully agile to allow the reception of any Echostar Dish Network™ or Bell ExpressVu DVB based QPSK transponder signal, (ITU-T J.83 Annex A). The module is housed in a specially designed chassis intended to accommodate the transcoder modules. Control of the modules is easily accomplished with a common power supply & control unit via operator selection from the front panel push button controls and back-lit LCD panel. This module interfaces to any of the QAM transcoder modules through a simple 12-pin connector and cable. The control module’s brain is a flash upgradeable microprocessor to ensure support for any future development.
Specifications

Satellite 8PSK Input
- Input Frequency Range: Agile 950-2150 MHz
- 8PSK Bandwidth: up to 36 MHz
- Frequency Step: 1 MHz
- Capture Range: ±5 MHz
- Input Level Range: -65 to -20 dBm
- RF Input Impedance: 75 Ω
- Return loss: 8 dB min.
- FEC Decoding: DVB
- Symbol Rate: 2 to 45 MspS
- Code Rate: Viterbi Auto Recognition
- I - Q Format: Normal / Inverted

QAM Output
- Output Frequency Range: Agile 54-860 MHz (CATV 2-135)
- QAM Bandwidth: 6 MHz
- Frequency Step: 6 MHz
- Output Level: +40 dBmV *
- Display Error: ±2 dB
- Level Adjustment Range: 15 dB
- Modulation Mode: 16, 32, 64, 128, 256 QAM (8PSK & 256 QAM Capable with optional QTM-HD)
- Symbol Rate: 1 MspS to 6.9 MspS
- Spectral Inversion: Auto Recognition
- Carrier Suppression: 45 dB
- Roll Off: 12, 15, 18 %
- QAM SNR: >40 dB
- MER: 38 to 41 dB
- RF Output Impedance: 75 Ω
- Spurious: -60 dBc
- Broadband Noise: -75 dBc min.
- (4 MHz BW @40 dBmV)
- Phase Noise @ 10 kHz: -90 dBc
- Frequency Stability: ± 10 kHz
- QAM I/Q Phase Error: < 1 degree
- I/Q Amplitude Imbalance: < 1 dB
- Controls and Indicators
- PCM
- Computer Control: 2 RJ11 Rear Panel RS232
- Connectors
- Backlit Liquid Crystal Display (LCD)
- 5 Navigation/Enter Push Buttons
- QTM Unit Status Indicator: 1 Green LED Per Module
- Mechanical
- Chassis Dimensions: 5.25 x 19.0 x 12 inches
- QTM Dimensions: 5.25 x 10.625 x 1.5 inches
- Mounting:
- Standard EIA Unit Height
- 5.25” x 19” Wide Rack Mount
- QTM Unit Weight: 1.7 lbs
- QTM-8 Weight: 28 lbs

Power
- Requirement: 100 to 265 VAC, 1A
- Frequency: 50 to 60 Hz
- Power Consumption:
  1 QTM & PCM: 15 W
  2 QTM & PCM: 25 W
  3 QTM & PCM: 35 W
  4 QTM & PCM: 45 W
  5 QTM & PCM: 56 W
  6 QTM & PCM: 66 W
  7 QTM & PCM: 76 W
  8 QTM & PCM: 87 W
- Fuse: 4 Amp, 250 VDC, SB

Environmental
- Operating Temperature: 0 to 50 °C
- Storage Temperature: -20 to 70 °C
- Humidity: 0 to 90 % RH

Ordering Information

QAM Transcoder

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<th>Model</th>
<th>Stock No.</th>
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<tbody>
<tr>
<td>QTM</td>
<td>6231</td>
<td>QAM Transcoder Module</td>
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<tr>
<td>QTM-HD</td>
<td>6241</td>
<td>QAM Transcoder Module, High Definition</td>
</tr>
<tr>
<td>QTM-HD PLUS</td>
<td>6242</td>
<td>QAM, Transcoder Module, High Definition Plus</td>
</tr>
<tr>
<td>QTPCM</td>
<td>6232</td>
<td>QAM Power Supply &amp; Control Module</td>
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<tr>
<td>QTRC</td>
<td>6233</td>
<td>QAM Transcoder Rack Chassis</td>
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<tr>
<td>QTRA-8</td>
<td>6230</td>
<td>QAM Transcoder Rack Assembly (contains 8 QTM and a QTPCM in a QTRC)</td>
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<td>QTRA-8 &amp; RFCS</td>
<td>6229</td>
<td>QAM Transcoder Rack Assembly (Contains 8 QTM and a QTPCM in a QTRC with a QTRFCS)</td>
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Accessories

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<th>Model</th>
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<tbody>
<tr>
<td>QTRFCS</td>
<td>6234</td>
<td>QT RF Combiner and Splitter (Contains QTRFC, 6234-1 and QTRFS, 6234-2)</td>
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<tr>
<td>QTHF</td>
<td>6235</td>
<td>QT Headend Fan</td>
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<tr>
<td>QTPB</td>
<td>6236</td>
<td>QT Blank Panel</td>
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<tr>
<td>QTSPS</td>
<td>6239</td>
<td>QT Standby Power Supply with Headend Fan</td>
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<tr>
<td>HDA-16-860-16</td>
<td>6240-16</td>
<td>Headend Distribution Amplifier (with 16 dB Gain, 16 Ports)</td>
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<tr>
<td>HDA-8-860-20</td>
<td>6240-08</td>
<td>Headend Distribution Amplifier (with 20 dB Gain, 8 Ports)</td>
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<tr>
<td>QC-HSK</td>
<td>2720</td>
<td>QCentral Remote Monitoring and Control Software</td>
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<tr>
<td>QTHF</td>
<td>6235</td>
<td>Headend Fan</td>
</tr>
<tr>
<td>HWS</td>
<td>2727</td>
<td>Headend Web Server</td>
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Headend Web Server
HWS

The Headend Web Server (HWS) from Blonder Tongue allows an operator the means to remotely access a QAM Transcoder Series headend from anywhere in the world using a web browser over the Internet without requiring any additional software to be installed. The HWS is an add-on hardware based solution housed in a single height, rack mountable unit. It features a built-in web server that hosts software just like the QCentral software to communicate to the QT headend.

Just like the original QCentral software, the HWS is a valuable addition so that an operator can quickly and painlessly get real time information from a remote headend location to troubleshoot and even fix a field failure from the business office or anywhere any internet connection is available. The easy to use interface provides many functions, such as display and control of the input transponder frequency, the output channel, digital signal level, the signal to noise ratio as well as the ability to remotely turn off the QAM signal and turn on a hot spare unit. We have built in many advanced features such as DHCP or static IP support as well as 2 levels of password control including read/write and read only access modes.

The Headend Web Server is the perfect tool for the QAM Transcoder digital headend. It offer’s the ultimate customer service solution for remote and unmanned headend locations with it’s user activated capability to “remotely diagnose and heal a field problem” and eliminating the need for a costly truck roll or lengthy downtime. Contact Blonder Tongue today to get your Headend Web Server for the QT Series.

Features & Benefits
- Remote Control & Monitoring of a QT Headend Over the Internet
- Works with Any Computer - Mac or PC Compatible
- DHCP or Static IP Support
- Easy to Use Graphical Interface Through a Web Browser
- LCD Based Front Panel Controls Make Setting-up a Breeze
- No Software Installation Required on a Computer

Specifications
Programming Capabilities
IP Addressing Modes:  Fixed or DHCP
Front Panel Settable User Name & Password
Front Panel Settable Headend Name
HTTP Web Browser Interface Requires No Additional Software

Mechanical
Dimensions:  10.0 x 19.0 x 1.75 inches
Weight:  4 lbs.
Mounting:   Standard EIA Unit Height
           10.0” x 19” Wide Rack Mount

Controls & Connectors
Front Panel:
  Backlit Liquid Crystal Display (LCD)
  5 Navigation/Enter Push Buttons
  3 Green Ethernet Status LEDs

Rear Panel Serial Ports:
  RS 232, RJ-11 Port for Connection QT Headend
  RS 232, RJ-11 Port for Firmware Upgrade Only

Rear Panel Ethernet Port:
  Physical Layer:  10BaseT RJ-45 WAN/LAN Ethernet Port
  Media Access and Link Layers:  Per IEEE 802.3 (Ethernet)

AC Power
Voltage:  117 ± 10% VAC
Frequency:  60 Hz
Power Consumption:  2W
Fuse:  0.25A

Environmental
Operating Temperature Range:  0 to 50°C
Storage Temperature Range:  -20 to 70°C
Humidity:  0 to 90 % RH

Ordering Information
- Remote Control & Monitoring of a QT Headend Over the Internet
- Works with Any Computer - Mac or PC Compatible
- DHCP or Static IP Support
- Easy to Use Graphical Interface Through a Web Browser
- LCD Based Front Panel Controls Make Setting-up a Breeze
- No Software Installation Required on a Computer

Model           Stock No.          Description
HWS-QT           2727              Headend Web Server for QT Series
The HDA Series of 19” rack mount headend distribution amplifiers are completely self-contained broadband devices, specifically designed for the distribution of digital and analog CATV signals in the frequency range from 47 to 860 MHz. The HDA is unique in the fact that it integrates the abilities of a passive combiner and a distribution amplifier into a single high performance unit.

State of the art hybrid power doubling amplifier modules enable the unit to operate at high output levels while maintaining low distortion characteristics. Four combiner configurations of 16, 12, 8 and 4 ports are available. A -30 dB low-level back matched test port is externally accessible enabling easy in-service testing and adjustment. The chassis design affords excellent heat dissipation allowing operation at high ambient temperatures without sacrificing reliability. Plus, the HDA has a built-in standby power supply with automatic switching capabilities.
Headend Distribution Amplifiers
HDA Series

Specifications

<table>
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<tr>
<th>Model</th>
<th>HDA-16-860-16</th>
<th>HDA-12-860-18</th>
<th>HDA-8-860-20</th>
<th>HDA-4-860-24</th>
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<tbody>
<tr>
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<td>6240-16</td>
<td>6240-12</td>
<td>6240-08</td>
<td>6240-04</td>
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<td>Slope Control Range:</td>
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<td>Noise Figure:</td>
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<td>-10 dB</td>
<td>-10 dB</td>
<td>-10 dB</td>
</tr>
<tr>
<td>No. of channels (Loading):</td>
<td>78</td>
<td>78</td>
<td>78</td>
<td>78</td>
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<tr>
<td>Output Level:</td>
<td>40/46 dBmV</td>
<td>38/44 dBmV</td>
<td>38/44 dBmV</td>
<td>38/44 dBmV</td>
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<tr>
<td>Composite Triple Beat (CTB):</td>
<td>-68 dB</td>
<td>-68 dB</td>
<td>-68 dB</td>
<td>-68 dB</td>
</tr>
<tr>
<td>Crossmodulation:</td>
<td>-69 dB</td>
<td>-69 dB</td>
<td>-69 dB</td>
<td>-69 dB</td>
</tr>
<tr>
<td>Composite 2nd Order (CSO):</td>
<td>-65 dB</td>
<td>-65 dB</td>
<td>-65 dB</td>
<td>-65 dB</td>
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<tr>
<td>Hum Modulation:</td>
<td>-65 dB</td>
<td>-65 dB</td>
<td>-65 dB</td>
<td>-65 dB</td>
</tr>
<tr>
<td>Input/Output Test Point Level:</td>
<td>-50 dB</td>
<td>-50 dB</td>
<td>-50 dB</td>
<td>-50 dB</td>
</tr>
<tr>
<td>Operating Temperature Range:</td>
<td>0 to +50 °C</td>
<td>0 to +50 °C</td>
<td>0 to +50 °C</td>
<td>0 to +50 °C</td>
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<tr>
<td>Number of Hybrids:</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type of Hybrids:</td>
<td>Power Doubling</td>
<td>Power Doubling</td>
<td>Power Doubling</td>
<td>Power Doubling</td>
</tr>
<tr>
<td>Power Requirements:</td>
<td>105-130 VAC</td>
<td>105-130 VAC</td>
<td>105-130 VAC</td>
<td>105-130 VAC</td>
</tr>
<tr>
<td>Power Consumption:</td>
<td>23.5 W</td>
<td>23.5 W</td>
<td>23.5 W</td>
<td>23.5 W</td>
</tr>
</tbody>
</table>

Dimensions: 19” W x 13/4” H x 10 3/4” D
Shipping Weight: 8 lbs.
RF Connectors “F” Type

Combiner Section Specifications

Insertion Loss:
- 54-500 MHz: 14 dB
- 500-860 MHz: 15 dB
- Output Return Loss: -10 dB
- Output Flatness 54-860 MHz: +/− 0.5 dB
- Isolation between any combination of Input Ports (1-4) or (5-8) or (9-12) or (13-16): 30 dB
- Isolation between any combination of Input Ports (1-4) and (5-8) or (9-12) and (13-16): 45 dB
- Input Return Loss: 14 dB
- Output Return Loss: 14 dB
- Combined Inputs Control Range: 15 dB

Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Stock No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDA-12-860-18</td>
<td>6240 12</td>
<td>Headend Distribution Amplifier 860 MHz 12 Port Equalized Combiner w/ 18 dB Total Gain</td>
</tr>
<tr>
<td>HDA-16-860-16</td>
<td>6240 16</td>
<td>Headend Distribution Amplifier 860 MHz 16 Port Equalized Combiner w/ 16 dB Total Gain</td>
</tr>
<tr>
<td>HDA-8-860-20</td>
<td>6240 08</td>
<td>Headend Distribution Amplifier 860 MHz 8 Port Equalized Combiner w/ 20 dB Total Gain</td>
</tr>
<tr>
<td>HDA-4-860-24</td>
<td>6240 04</td>
<td>Headend Distribution Amplifier 860 MHz 4 Port Equalized Combiner w/ 24 dB Total Gain</td>
</tr>
</tbody>
</table>
Modular QPSK to QAM Transcoder
MQQT Series

Features & Benefits

- Modular Design Allows One to Four Single Transcoder Modules in a Single Rack Space
- Fully Agile Output Frequency Range of 54-860 MHz
- Back-Lit LCD Display Panel with Front Panel Accessible Push Button Controls Provides Access to All Vital Unit Information and Makes Set-Up and Troubleshooting a Breeze
- Off-Site Remote Operation and Control Including Digital Adjustment of the QAM RF Output Level with High Performance QCentral Computer Software
- 256 QAM and Null Packet Stuffing Capability Upgradeable with Field Installable Optional PC Board Modules
- Forced Air Cooling and Ventilation for Each Individual Section Allows Units to be Stacked Directly to Minimize Rack Space
- Optional Redundant/Standby Power Support Capability Built in to Every Unit

The MQQT - Modular QPSK to QAM Transcoder builds upon the QQQT 4 transcoders in 1 unit concept, but incorporates a modular design. Plus, the MQQT takes QPSK to QAM transcoder performance to a new level, while maintaining Blonder Tongue’s long-standing tradition of providing the best price/quality combination available. The product is comprised of individual transcoder modules and a single power supply/control module in a single rack height chassis. The modularity allows for transcoder sections to be added or changed one at a time. Phase noise performance is -95 dBc to meet the DigiCipher® II 256 QAM specification and the MQQT can be upgraded for both 256 QAM processing or null packet stuffing capabilities with a simple field-installable PC board. And finally, the MQQT can be fully controlled remotely via the QCentral Computer Software including digital adjustment of the QAM RF output level.

The digital cable solution that all small system and MDU cable operators have been waiting for has arrived! Quick Take from AT&T HITS & Canada’s Starchoice is the program that enables an operator the ability to deliver up to 200 programs of state of the art digital television. The hardware required for this solution is a combination of Motorola QAM decoders in the home and Blonder Tongue Transcoders at the headend. Blonder Tongue Transcoders save precious system bandwidth by transcoding a 24-36 MHz QPSK satellite transponder signal to a 6 MHz QAM signal for distribution on cable television systems. The Motorola QAM decoder in the home provides both digital and analog viewing with an operator branded viewer menu system (program guide).
Modular QPSK to QAM Transcoder
MQQT Series

Specifications

Satellite QPSK Input
- Input Frequency Range: Agile 950-2150 MHz
- QPSK Bandwidth: up to 36 MHz
- Frequency Step: 1 MHz
- Capture Range: ±10 MHz
- Input Level Range: -65 to -25 dBm
- RF Input Impedance: 75 Ω
- Return loss: 8 dB min.
- FEC Decoding: DigiCipher® II / DVB
- Symbol Rate: 2 to 45 Msps
- Code Rate: Viterbi Auto Recognition
- I - Q Format: Normal / Inverted

EAS Input
- IF Bandwidth: 6 MHz
- IF Frequency: 44 MHz
- Input Impedance: 75 Ω
- Input Level: +35 dBmV ±1 dB
- Auto Switching Level: Capable

QAM Output
- Output Frequency Range: Agile 54-860 MHz (CATV 2-135)
- QAM Bandwidth: 6 MHz
- Frequency Step: 6 MHz
- Output Level: +50 dBmV *
- Display Error: ±2 dB max.
- Level Adjustment Range: 15 dB
- Modulation Mode: 16, 32, 64, 128, 256 QAM (256 QAM field upgradeable with optional PCB)
- Symbol Rate: 1 Msp to 5.4 Msp
- Spectral Inversion: Auto Recognition
- Carrier Suppression: 45 dB
- Roll off: 12, 15, 18 %
- QAM SNR: >40 dB
- MER: >38 dB
- RF Output Impedance: 75 Ω
- Spurious: -60 dBc
- Broadband Noise: -75 dBc min. (4 MHz BW)
- Phase Controls and Indicators
- Computer Control: 2 RJ11 Rear Panel RS232 Connectors
- Backlit Liquid Crystal Display (LCD)

PSK Signal Status Indicator:
1 LED per module

QAM Signal Status Indicator:
1 LED per module

Mechanical
- Dimensions: 1.75 x 19.0 x 18.5 Inches
- Mounting: Standard EIA Unit Height 1.75” x 19” Wide Rack Mount
- Unit Weight: 10.5 lbs
- Shipping Weight: 11.5 lbs

Power
- Requirement: 100 to 265 VAC
- Frequency: 50 to 60 Hz
- Power Consumption: 40 Watts

Environmental
- Operating Temperature: 0 to 50 °C
- Storage Temperature: -20 to 70 °C
- Humidity: 0 to 90 % RH

Ordering Information

Core MQQT Products

<table>
<thead>
<tr>
<th>Model</th>
<th>Stock No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MQQT</td>
<td>6294</td>
<td>Modular QPSK to QAM Transcoder Comes Factory configured w/ 4 STM, 1 PSCM in a 4MCH</td>
</tr>
<tr>
<td>MQQT-STM</td>
<td>6291</td>
<td>Modular QPSK to QAM Transcoder - Single Transcoder Module Agile QAM Output 54-860 MHz (CATV 2-135), +50 dBmV</td>
</tr>
<tr>
<td>MQQT-PSCM</td>
<td>6292</td>
<td>Modular QPSK to QAM Transcoder-Power Supply &amp; Control Module Supports 4 Single Transcoder Modules &amp; Standby Powering</td>
</tr>
<tr>
<td>MQQT-4MCH</td>
<td>6293</td>
<td>Modular QPSK to QAM Transcoder - Four Module Chassis High Performance Lightweight Chassis for 4 STM &amp; 1 PSCM</td>
</tr>
<tr>
<td>MQQT-SP 1</td>
<td>6296 1</td>
<td>Modular QPSK to QAM Transcoder - Standby Power Adds automatic Standby/Redundant Power Support for MQQT</td>
</tr>
<tr>
<td>MQQT-SP 2</td>
<td>6296 2</td>
<td>Modular QPSK to QAM Transcoder - Standby Power Adds automatic Standby/Redundant Power Support for MQQT</td>
</tr>
<tr>
<td>MQQT-SP 3</td>
<td>6296 3</td>
<td>Modular QPSK to QAM Transcoder - Standby Power Adds automatic Standby/Redundant Power Support for MQQT</td>
</tr>
<tr>
<td>MQQT-SP 4</td>
<td>6296 4</td>
<td>Modular QPSK to QAM Transcoder - Standby Power Adds automatic Standby/Redundant Power Support for MQQT</td>
</tr>
</tbody>
</table>

* Average Measurement
The DQX is a Modular Digital QAM Upconverter intended for data over cable and digital video-on-demand (VOD) applications. The modular design allows from one to four independent single IF upconverter modules (DQX-SXM) to be housed in one 1.75” rack space. The unit uses a common power supply and control module (DQX-PSCM) to manage all four of the upconverters. An easy to read back-lit LCD is used to display all of the module information. The unit features an advanced menu system based on a flash upgradeable microcontroller. This facilitates programming information to be easily entered with front panel accessible push button navigation switches.

An advanced yet simple computer software package is available to allow local and off-site remote operation and control of the unit including digital level adjustments. Plus, support for redundant standby power is built in as well.

**Specifications**

**IF Input**
- IF Bandwidth: 6 MHz
- IF Frequency: 44 MHz (Center Frequency)
- Input Impedance: 75 Ω
- IF Return Loss: 20 dB min.
- Input Level: +35 dBmV ±1 dB

**QAM Output**
- Output Frequency Range: Agile 54-864 MHz (CATV 2-135)
- QAM Bandwidth: 6 MHz
- Frequency Step: 12.5 kHz
- Output Level: +50 dBmV *
- Display Error: ±2 dB max.
- Level Adjustment Range: 15 dB
- Output Modes: Standard, HRC, IRC & Frequency Tuning in 12.5 kHz Increments
- RF Output Impedance: 75 Ω
- RF Return Loss: 10 dB min.
- Spurious: -60 dBc
- Broadband Noise: -75 dBc min.
- (4 MHz BW @ +50 dBmV Output)
- Phase Noise:
  - @ 1 kHz: -57 dBc min.
  - @ 10 kHz: -95 dBc min.
  - @ 20 kHz: -104 dBc min.

**Controls and Indicators**
- Computer Control:
  - 2 RJ11 Rear Panel, RS232 Connectors
- Backlit Liquid Crystal Display (LCD)
- 5 Push Button Navigation Controls

**Mechanical**
- Dimensions: 1.75 x 19.0 x 18.5 Inches
- Mounting: Standard EIA Unit Height 1.75” x 19” Wide Rack Mount
- Unit Weight: 9.5 lbs (4 Channels)
- Shipping Weight: 10.5 lbs

**Power**
- Requirement: 100 to 265 VAC
- Frequency: 50 to 60 Hz
- Power Consumption:
  - 2632-1: 12 Watts
  - 2632-2: 18 Watts
  - 2632-3: 24 Watts
  - 2632-4: 31 Watts

**Environmental**
- Operating Temperature: 0 to 50 °C
- Storage Temperature: -20 to 70 °C
- Humidity: 0 to 90 % RH

**Features & Benefits**
- Modular Design Allows One to Four Single Upconverter Modules in a Single Rack Space
- Fully Agile Output Frequency Range of 54-864 MHz, Std., HRC, IRC and 12.5 KHz Increment Tuning Supported
- Back-Lit LCD Display Panel with Front Panel Accessible Push Button Controls Provides Access to All Vital Unit Information and Makes Set-Up and Troubleshooting a Breeze
- Off-Site Remote Operation and Control Including Digital Adjustment of the QAM RF Output Level with High Performance Computer Software
- 256 QAM & Standby/Redundant Power Capable

**Ordering Information**

<table>
<thead>
<tr>
<th>Complete Units</th>
<th>Stock No.</th>
<th>Description</th>
<th>Ala Carte Components</th>
<th>Stock No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>DQX-1</td>
<td>2632 1</td>
<td>DQX - Digital QAM Upconverter - Single Channel</td>
<td>DQX-SXM</td>
<td>2621</td>
<td>DQX - Digital QAM Upconverter - Single Upconverter Module</td>
</tr>
<tr>
<td>DQX-2</td>
<td>2632 2</td>
<td>DQX - Digital QAM Upconverter - Two Channel</td>
<td>DQX-PSCM</td>
<td>2622</td>
<td>DQX - Digital QAM Upconverter-Power Supply &amp; Control Module</td>
</tr>
<tr>
<td>DQX-3</td>
<td>2632 3</td>
<td>DQX - Digital QAM Upconverter - Three Channel</td>
<td>DQX-4XCH</td>
<td>2623</td>
<td>DQX - Digital QAM Upconverter - Four Upconverter Chassis</td>
</tr>
</tbody>
</table>
Installing a digital program has never been easier with the DSR-470 and Blonder Tongue Transcoders.

The Motorola DSR-470 is a consumer receiver that allows Cable Operators who cannot readily upgrade to digital cable to offer digital programming to tenants with a unique satellite delivery method. Satellite-friendly, digital QPSK modulated signals are converted to cable-friendly, digital QAM modulated signals by the Blonder Tongue Transcoder headend equipment. When combined with analog cable signals and existing cable wiring, this new system provides viewers instant access to over 200 program channels of digital and analog programming over a single coaxial cable without hanging satellite dishes at each subscribers home.

To facilitate this type of digital cable system, the DSR-470 decoder accepts program signals, authorization and control commands like a satellite receiver, but it’s installed at the end of the coaxial cable system, Equipped with both a digital QAM (Quadrature Amplitude Modulation) and analog tuner, the DSR-470 offers a wide range of viewing options, the combined offerings of analog cable and digital satellite, to each subscribers location. In addition, Motorola has developed a unified digital/analog on-screen program guide so that the viewer can seamlessly scan all available channels. Cable operators also have the ability of branding the on-screen guide with their logo or name.
QAM Digital Entertainment Receiver
DSR-470

Specifications

Cable Input
- Input Frequency: 54 to 860 MHz
- Input Impedance: 75 W
- Analog Input Level: 0 to (+)15 dBmV
- Digital Input Level: (-)18 to (-)5 dBmV (64 QAM)
  (-)12 to (-)5 dBmV (256 QAM)
- Noise Figure @ 10 dBm Input: <10 dBm
- Digital Processing
  Demodulation: 64 and 256 QAM
- Symbol Rates:
  5.056941 (64 QAM) 4.966862 and 5.360537 (256 QAM)

Cable Video (Response)
- Frequency Response:
  (+)1.58 to (-)1.94 dB, 0.5 to 3.0 MHz
  (+)1.58 to (-)2.98 dB, @ 3.58 MHz
- Differential Gain: 8.0% p-p maximum
- Differential Phase: 8.0° p-p maximum
- S/N: 49 dB minimum @ 6 dBmV
  (unified weighing 100 kHz to 4.2 MHz)

DIGICIPHER® II Composite Video
- Outline Level:
  1.0 V p-p ± 10% sync tip to reference white
- Frequency Response (NTSC):
  ±1.0 dB1 kHz to 4.2 MHz
- C-L Delay Inequality: ± 50 nsec
- Diff Gain: 5.0% p-p max (10-90% APL)
- Diff Phase: p-p max (10-90% APL)
- Luminance SNR: 57 dB
- VHF Output
  Impedance: 75 Ω
- Channel: Channel 3 and 4
- Level, Video:
  66 dBuV ± 3 dB from VHF modulator
- Audio: Mono, SAP (menu selected)

Audio
- Modes:
  Digital stereo (stereo or surround),
  S/PDIF for AC-3 where available,
  analog stereo (BTSC) cable audio (analog)
- Frequency Response: ±3.0 dB, 50 Hz to 10 kHz
- Harmonic Distortion: 2.0% maximum @ 1 kHz

DIGICIPHER® II Audio (Analog)
- Number of Stereo Outputs: 2
- Impedance: 110 W Maximum
- Output Level: 5.66 V p-p ± 10% into 2kΩ
- Frequency Response:
  1.0 dB p-p, 20 Hz to 20 kHz
- THD:
  0.3% Maximum from 20 Hz to 20 kHz
  Referenced to (+)10 dBm Encoder
- SNR: 85 dB Minimum
- Stereo Channel Isolation:
  60 dB Minimum Asynchronous Data
- Data Rate:
  1200, 2400, 4800, 9600 and 19200 bps
- Format: Asynchronous 10 bit Characters
- Mode: Simplex
- Interface:
  RS-232 Voltages and Impedance Levels
- Connector: Mini Phone High Speed Data
- Data Rate: 29.27 Mbps ± 20 ppm
- Format: AML Encoded with 8% Minimum
- Transition Density

Physical/Environmental
- Temperature: 0º - 40ºC (Ambient)
- Humidity: 95% Relative
- Dimensions:
  13.6”(W) x 2.5”(H) x 15”(D)
- Weight: Approx 11 lbs
- Power Input:
  115V ± 10% AC, 60 Hz (nominal),
  25 W (maximum)
- Regulatory Compliance:
  UL listed, CSA Certified

Other
- Remote: 2 x AA Batteries
- Limited Warranty: One year

Ordering Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Stock No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSR-470</td>
<td>5899</td>
<td>Consumer QAM Set Top - Integrated Receiver Decoder DigiCipher II</td>
</tr>
<tr>
<td>DSR-471</td>
<td>5891</td>
<td>Consumer QAM Set Top - Integrated Receiver Decoder (Canada) DigiCipher II</td>
</tr>
</tbody>
</table>

www.blondertongue.com  •  800-523-6049