

# SOLUTIONS FOR ALL YOUR APPLICATIONS

**QTM-HD-4 (QAM Transcoder Module)** contains four (4) independent transcoders in a single module. Each of these transcoders accepts one (1) input in QPSK or 8PSK format, and the module delivers four outputs in QAM format in the 54-864 MHz range.

An integrated satellite selector switch allows operator to select any of the QPSK/8PSK inputs from up to 4 different satellites without the need for a separate external multiswitch. The 4 RF QAM output channels can be grouped in any 42 MHz-wide span, for example grouped consecutively in a 24 MHz-wide span, or grouped as two pairs of adjoining RF channels each 12 MHz wide, or any other possible combination of 4x 6 MHz-wide channels placed in a 42 MHz-wide span.

The QTM-HD-4-NPU functions the same as the QTM-HD-4, but with a "Null Packet" feature that allows adding/removing null packets to/from the input stream.

The QTM-HD-4/NPU may be monitored and controlled via GUI-based web pages from any computer either locally or via the internet.



### **Features**

- Supports QPSK/8PSK inputs (DVB-S, DVB-S2, Turbo FEC)
- Equipped with an integrated satellite switch that allows operator to select inputs from 4 different satellites
- Supports ITU-T J.83 Annex A and Annex B QAM output (QAM 16, 32, 64, 128, 256)
- Can be deployed with QTM-HD-Plus (stock 6242) for applications requiring QAM 512/1024 modulation
- Compact design allows for deployment of 4 units (16 transcoders), including the power & control module, in 3RU
- GUI-based menu, including SNMP-based management, provides remote monitoring/control capabilities
- 4x 8 MHz-wide QAM channel optional software is available

# **Ordering Information**

Model   Stor     QTM-HD-4   6243     QTM-HD-4-NPU   6223     QTPCM-4   6238	QAM Transcoder Module; QPSK/8PSK input, QAM 256 output QAM Transcoder Module; QTM with "Null Packet" feature QT Power and Control Module (one per chassis)	
QTRC 6233	A Rack Chassis; 3RU (holds up to 4 QTM-HD-4 modules and 1 QTPCM-4)	The second s

#### Made in U.S.A.

# **Specifications**

#### Input

Connector:	4x "F" Female
Standards:	$QPSK\ \&\ 8PSK\ (DVB-S,\ DVB-S2,\ DCII,\ LDPC/BCH,\ \&\ Turbo\ FEC)$
Symbol rate DVB-S: DVB-S2: 8PSK Turbo:	Variable; 5 to 33 MSymbols/sec (Mbaud)
Frequency Range:	950 to 2150 MHz
Frequency Granularity:	1 MHz
Bandwidth:	Variable, up to 36 MHz
Capture Range:	± 5 MHz
Code Rate DVB-S: DVB-S2 (QPSK): DVB-S2 (8PSK): Turbo FEC (QPSK): Turbo FEC (8PSK):	
Forward Error Correction (FEC):	DVB / DigiCiper® II
Input Level:	-65 to -20 dBm
Impedance:	75 Ω
Return Loss:	Greater than 9 dB

#### Output

Connector: Modulation:1x "F" Female (4x RF QAM channels combined) QAM 16, 32, 64, 128, and 256 ITU-T J.83; Annex A and B Variable; up to 7 MSymbol/sec (MBaud) 54 to 864 MHz CATV Channel Selectable (CH. 2 to 135) 4x 6 MHz in any 42 MHz-wide spectrum RF Level: Adjustment Range: Frequency Tolerance: Frequency Stability: 4x 6 MHz in any 42 MHz-wide spectrum $\pm 400 \text{ dBmV} \pm 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 42 \text{ dBmV} 1 \text{ dB} (100 \text{ dBµV} \pm 1 \text{ dB})$ $\pm 32 \text{ to } \pm 32 \text{ to } 52 \text{ G}$ $-30 \text{ dB} (20 \text{ co } 50 \text{ CO} \text{ to } 50^{\circ} \text{ CO} \text{ dB} \text{ to } 50^{\circ} \text{ CO} \text{ dB} \text{ to } 55 \text{ ME} \text{ to } 55 \text{ ME} \text{ to } 55 \text{ ME} \text{ to } 32 \text{ dB}  $		
Modulation: Standard:QAM 16, 32, 64, 128, and 256 ITU-T J.83; Annex A and B Variable; up to 7 MSymbol/sec (MBaud) 54 to 864 MHz CATV Channel Selectable (CH. 2 to 135) 4x 6 MHz in any 42 MHz-wide spectrum +40 dBmV ±1 dB (100 dBµV ±1 dB) +32 to +42 dBmV, 1 dB increment ± 0.5 kHz @ 77°F (25° C) ± 5 kHz over 32° to 122° F (0 to 50° C) ± 0.5 kHz @ 10 kHz) -95 dBc (@ 10 kHz) -95 dBc (@ 10 kHz) -60 dBc -70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth) 75 Ω Return Loss: Signal-to-Noise Ratio (SMR): Greater than 40 dB typical Greater than 39 dB typical Less than 1 degree	Connector:	1x "F" Female (4x BE OAM channels combined)
Standard:ITU-T J.83; Annex A and BDVB Symbol Rate:ITU-T J.83; Annex A and BDVB Symbol Rate:Variable; up to 7 MSymbol/sec (MBaud)Frequency Range:54 to 864 MHzTuning:CAnnels' Bandwidth:RF LevelA 6 MHz in any 42 MHz-wide spectrumRF Level Adjustment Range:+40 dBmV ±1 dB (100 dBµV ±1 dB)Frequency Tolerance:± 0.5 kHz @ 77°F (25° C)Frequency Stability:± 5 kHz over 32° to 122° F (0 to 50° C)Amplitude Flatness:± 0.25 dB (over 6 MHz channel)Phase Noise:-95 dBc (@ 10 kHz)Garrier Suppression:45 dBReturn Loss:14 dB typicalGreater than 40 dB typicalGreater than 39 dB typicalL/Q Phase Error:Less than 1 degree		
DVB Symbol Rate: Frequency Range: Tuning: Channels' Bandwidth: RF Level Frequency Tolerance: Frequency Stability: Hamplitude Flatness: Broadband Noise: Return Loss: Return Loss: Bignal-to-Noise Ratio (SMR):Variable; up to 7 MSymbol/sec (MBaud) 54 to 864 MHz CATV Channel Selectable (CH. 2 to 135) 4x 6 MHz in any 42 MHz-wide spectrum +40 dBmV ±1 dB (100 dBµV ±1 dB) +32 to +42 dBmV, 1 dB increment ± 0.5 kHz @ 77°F (25° C) ± 5 kHz over 32° to 122° F (0 to 50° C) ± 0.25 dB (over 6 MHz channel) -95 dBc (@ 10 kHz) -60 dBc -70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth) 75 Ω Greater than 40 dB typical Greater than 39 dB typical Less than 1 degree		
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Tuning: Channels' Bandwidth: RF Level:CATV Channel Selectable (CH. 2 to 135) $4x 6 MHz in any 42 MHz-wide spectrum+40 dBmV \pm 1 dB (100 dByV \pm 1 dB)+32 to +42 dBmV, 1 dB increment\pm 0.5 kHz (@ 77°F (25° C)\pm 5 kHz over 32° to 122° F (0 to 50° C)\pm 0.25 dB (over 6 MHz channel)-95 dBc (@ 10 kHz)-95 dBc (@ 10 kHz)-60 dBc-70 dBc (@ +40 dBmV output level, 5.5 MHz bandwidth)75 \OmegaCarrier Suppression:Return Loss:45 dB14 dB typicalGreater than 39 dB typicalI/Q Phase Error:$		
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RF Level: +40 dBmV ±1 dB (100 dBµV ±1 dB)   RF Level Adjustment Range: +32 to +42 dBmV, 1 dB increment   Frequency Tolerance: ± 0.5 kHz @ 77°F (25° C)   Frequency Stability: ± 0.5 kHz @ 77°F (25° C)   Amplitude Flatness: ± 0.25 dB (over 6 MHz channel)   Phase Noise: -95 dBc (@ 10 kHz)   Spurious: -60 dBc   To dBc (@ +40 dBmV output level, 5.5 MHz bandwidth)   T5 Ω   Carrier Suppression:   Return Loss:   Id dB typical   Greater than 40 dB typical   Greater than 39 dB typical   Less than 1 degree	Channels' Bandwidth:	4x 6 MHz in any 42 MHz-wide spectrum
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MER: Greater than 39 dB typical I/Q Phase Error: Less than 1 degree	Signal-to-Noise Ratio (SNR):	
I/Q Phase Error: Less than 1 degree		
	I/O Phase Error:	51
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#### General

Dimensions (W x D x H) QTM-HD-4 Module: QTPCM Module: QTRC Rack Chassis:	3.0 x 10.6 x 5.25 inches (38 x 270 x 134 mm) 4.5 x 10.6 x 5.25 inches (114 x 270 x 134 mm) 19 x 12.0 x 5.25 inches (483 x 305 x 134 mm)
Power:	105 to 240 VAC; 50/60 Hz
Power Dissipation QTM-HD-4 Module:	21 W
Weight QTM-HD-4 Module: Fully-loaded Rack Chassis:	1.7 lbs (0.77 kg) 28 lbs (12.7 kg)
<b>Operating Temperature:</b>	32 to 122 °F (0 to 50 °C)
Storage Temperature:	-13 to 158 °F (-25 to 70 °C)
Operating Humidity:	0 to 95% RH @ 35 °C max, non-condensing
Storage Humidity:	0 to 95% RH @ 35 °C max, non-condensing

## Alarms/Monitoring/Control

Indicators QTM-HD-4 Module: QTPCM Module:	Status (Green LED) Power and Status (Green LED)
Remote Monitoring/Control:	GUI-based Menu via web browser

## **Related Product**

ModelDescriptionQTM-HD-PLUSQPSK/8PSK-to-QAM 512/1024 Transcoder, 8 transcoders in 3RU

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