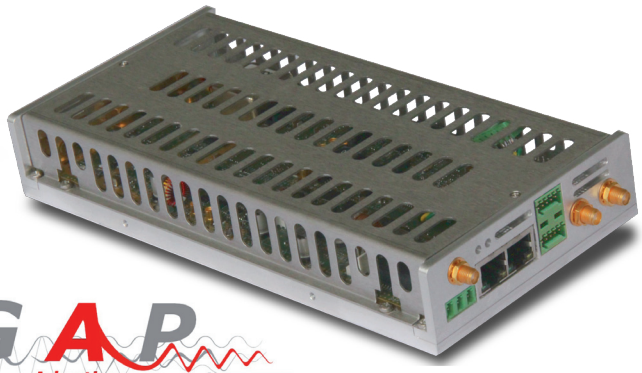
TeamCast technology

TORNADO

High-End OEM DTMB Modulator



GAP Green Adaptive Processing

DTMB
DVB T2
DVB T
PAL

Key features:

- Native Digital Adaptive Precorrection
- Green Adaptive Processing for best TX efficiency
- Full compliant DTMB (TDS-OFDM and Single Carrier signal waveforms)
- Software option for DVB-T2
- Redundant ASI and IP inputs switching
- MFN and SFN operating
- Onboard GPS
- Cost-effective, reliable and compact design

Key Benefits

- **Cutting Edge Digital Adaptive Precorrection algorithm (GAP®)**
- **Top class of RF performances**
- **State-of-the-art DTMB/CTTB modulation core**
- **Native IP streaming inputs**
- **World-wide leading and proven DVB-T2 technology**
- **Cost-effective, reliable and compact OEM design**

Description

The TORNADO product is a last generation OEM DTMB digital modulator bringing highest performances and maximum standard usage flexibility. It has been especially designed to meet Chinese Transmitter manufacturers' demand for integrating a high-end digital modulator with top class of RF signal performances providing a high MER value, excellent shoulder levels and lowest phase noise (compliant with SARFT requirements).
Digital Adaptive Precorrection circuits, powered by TeamCast GAP® - Green Adaptive Processing - algorithm, permits to run transmitters very close to their saturation limit, with unequalled RF signal performances and allowing significant gain in term of transmitting Power Efficiency.

World-wide leading and proven DVB-T2 technology

DVB-T2 transmission is supported as a software option on TORNADO. This would authorize DTMB transmitter manufacturers to rapidly launch their own product for DVB-T2 addressing a world-wide and a constantly growth market. TORNADO inherits from the world-wide leading DVB-T2 technology designed by TeamCast and already in use in main of the commercial DVB-T2 networks today in operation. In particular, this DVB-T2 modulation core bring unmatched standard compliant features such as System A and System B transmission schemes for both MFN and SFN operating modes, SISO/MISO, Multi-PLP layered modulation and hybrid T2-Base & T2-Lite simultaneous transmission.

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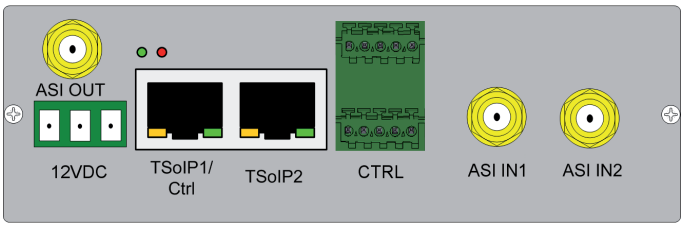
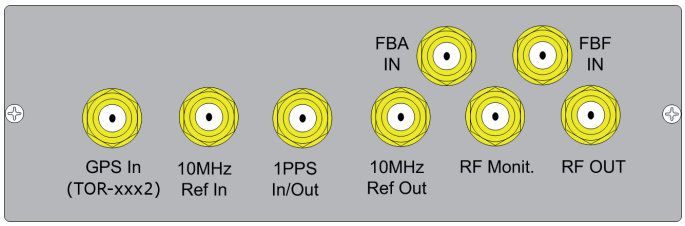
Connectors





Specifications[1]

Standards
- o DTMB: GB20600-2006, GY/T 229.1-2008 (SIP)
- o DVB-T2: EN 302 755, TS 102 831, TS 102 773 (T2-MI)
- o T2-Lite: DVB-T2 specification, 1.3.1 Annex 1
- o DVB-T: EN 300 744, TS 101 191
- o PAL: PAL B/G, D/K, I, H, N - 625 lines

ASI Stream Interfaces
- o 2 x ASI input SMA connectors - 75 Ω
- o 1 x ASI output SMA connector - 75 Ω
- o 188/204 Bytes- 80 Mbps maxi. Packet/burst mode

Gigabit Streaming Inputs (Option)
- o 2 x 10/100/1000 base-T - RJ45
- o Protocols: IP, RTP, UDP, IGMP (V2 & V3)
- o VLAN ID (1 to 4094) - IEEE 802.1q
- o TS encapsulation and FEC decoding: SMPTE-2022

RF Outputs
- o RF output from 470 MHz up to 862 MHz, 0 dBm - SMA connector 50 Ω
- o High MER: 44dB (typical)
- o Low level (-20 dB) output available for monitoring - SMA connector 50 Ω

Clock and Synchronization
- o High quality internal clock
- o 10 MHz & 1 PPS input/output
- o Clock and time source redundancy management
- o Optional Onboard GPS

DTMB Stream Process and Modulation
- o Stream input redundancy management (primary & secondary streams)
- o Transmission modes: MFN and SFN
- o Modulation modes: TDS-OFDM and single carrier
- o Constellation: 4QAM-NR, 4QAM, 16QAM, 32QAM or 64QAM
- o FFT: 4K
- o Bandwidth: 8MHz
- o FEC: 1/9, 1/7, 1/4
- o LDPC code rate: 0.4, 0.6, 0.8
- o Time Interleaving: OFF, 48, 240, 720
- o Test modes: PRBS, Sinus, Spectrum-Gap and Null Symbol insertion

Digital Adaptive Precorrection
- o Linear DAP: Amplitude ±3 dB, Delay 0 to 3µs
- o Non Linear DAP: Phase ±180°
- o Monitoring: SNR, left & right shoulders and DAP status
- o Crest Factor Reduction (PAPR) and Protection clipping
- o 2 x RF feedback inputs for DAP: -15 dBm to -5 dBm - SMA connector 50 Ω

Control & Monitoring
- o 1 x 10/100/1000 base-T Ethernet port
- o 1 x RS232 + 1 x RS485 serial control ports

Physical
- o Single supply voltage (12 VDC)
- o Power Consumption: < 32 W
- o 240 x 110 x 35 mm (Size C)
- o 240 x 220 x 35 mm (Size A)
- o Temperature: 0°C to 50°C

Ordering Information

XTTM-TOR0-303X	DTMB modulator - DVB-T2 ready - with UHF output and DAP - Size C
XTTM-TOR0-201X	DTMB modulator - DVB-T2 ready - with UHF/VHF output - Size C
XTTM-TOR0-X2XX	Module with PAL modulation - Size A (XTTM-TOR0-32XX) or Size C (XTTM-TOR0-22XX)
XTTM-TOR0-XXX2	Module with onboard GPS
XTTO-TOR0-T2SW	DVB-T2 software license for TORNADO
XTTO-TOR0-TSIP	TSoIP input streaming license for TORNADO
XTTO-TOR0-T2LI	T2-Lite software license for TORNADO
XTTO-TOR0-EGAP	Green Adaptive Processing (GAP) software license for TORNADO

[1] Specifications are not contractual and are subject to revision without notice.

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