TeamCast
s o l u t i o n s

Satellite

Tyger

DVB S2X®
DVB S2®

WIDEBAND Satellite Modulator

DVB CID®

Wideband Satellite modulator for:

• High speed data links up to 2Gbits/s (Ka-Band, HTS)

• V-SAT uplinks

• HTS systems

Application Overview

DVB-S2/S2X Annex M addresses the use of wideband satellite transponders. This definition allows for hundreds of MHz of combined transmission. It is technically possible now to allocate several 36 MHz channels (36MHz) inside these wideband transponders, but this would require a reduction of downlink power and therefore a lower data rate. Using a single frequency is more efficient (+/- 20%) because it allows a true Back-off reduction as well as allowing higher power thanks to a large bandwidth value. Currently, satellite receivers are under development to demodulate this complete wideband signal resulting in very high data rates. To achieve this demodulation, a time-slicing concept contained in Annex M has been adopted for this new revision of the DVB-S2/S2X standards where the receiver processes only the dedicated time-slice data. This approach significantly reduces the complexity of the receiving device (STB) and in turn creates the opportunity for new applications like high speed data link over Ka-Band. This data link can be used as a cost-efficient High bit Rate broadband Internet access High Throughput Satellite (HTS) at perfor¬mances equivalent to fiber or LTE networks; or news delivery applications as Wideband Direct To Home (DTH) networks with up to a 20% efficiency gain.

Key features :

• DVB-S2/S2X standards

• Symbol Rate: up to 480 Mbauds

• GSE-Lite (HEM)

• Annex M according to EN 302 307 standard

• Carrier ID system (NIT & DVB)

• Inputs: 8 ASI + 4x1GigE + 2x10GigE

• Multistream (up to 8 MPTS), according to EN 302 307 standard, over ASI & Ethernet

• linear & Non Linear pre-correction

• roll-off from 5 to 35%

• Up to 64 embedded profiles

Technical Overview

Tyger is a state-of-the-art high-Symbol-Rate (HSR) satellite modulator fully compliance with the DVB-S2 and DVB-S2X standards. Teamcast's Tyger modulator covers the full L-Band range (950/2150 MHz) and offers bit rate from 1 Mbps up to 2 Gbps with a Symbol Rate from 1 to 480 MBauds. Tyger uses 8 ASI, 4x1GigE and 2x10GigE ports as inputs, this offers a diversity of input formats such as MPEG-TS over ASI, MPEG-TS over Ethernet (SMPTE-2022 format) and IP Datagram over GSE-Lite encapsulations in High Efficiency Mode (HEM) configuration (according to the annex D of the ETSI TS 102 606-1 standard). Tyger allows for high speed data link applications with or without the Annex M and multistream configuration with up to 8 ISI possible mixed between ASI and Ether¬net inputs. All of these configurations are compliant with the DVB-S2/S2X standards. Due to the RF wideband signal (up to 500MHz), Static Linear and/or Non Linear Pre-correction tool(s) could be required and are available on Tyger andare fully configurable by GUI or remote control.

Tyger integrates the core technology required to perform high quality modulation based on TEAM-CAST expertise. It provides customers with a best in class performance, providing a high SNR value, excellent shoulder levels and lowest phase noise. Tyger provides a high performance channel spectrum and in addition to the standard roll off from 5 to 35% by step of 1% for the all modula¬tion DVB-S2 and DVB-S2X. This results gives an efficient transmission in 32APSK (DVB-S2/S2X) and 256APSK (DVB-S2X) with lower power.

The user-friendly Embedded Web Browser ensures ease of use and enables full configuration of the modulator, including signal input management: physical ASI/Ethernet, format MPEG-TS/ IP Datagram, redundancy; selection of DVB-S2 and DVB-S2X, modulation type (MODCOD), Static Linear and Non Linear pre-correction configurations and control of the mute/ unmute conditions for the RF output signal. The GUI also offers monitoring of the input stream (i.e. input format & useful bit rate).

TYGER WideBand Satellite modulator
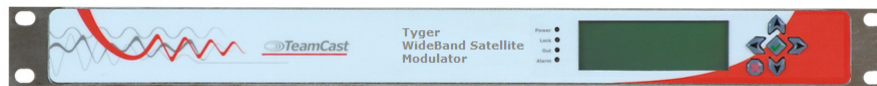
Specifications[1]

■ Standards
- o Carrier ID: ETSI 103 129
- o DVB-S2X: EN 302 307 part II
- o DVB-S2: EN 302 307 part I
- o DVB Generic Stream Encapsulation (GSE-Lite): ETSI TS 102 606-1
- o DVB Multi Protocol Encapsulation (MPE): ETSI EN 301 192
- o DVB MPEG-TS over ASI: EN50083-9, ETSI TR 101 891
- o DVB MPEG-TS over IP: ETSI TR 102 034 (SMPTE-2022)
- o MPEG-TS: ISO/IEC 13818-1
- o MPEG-2 PSI Tables (PAT and PMT): EN 300 468

■ Inputs
- o MPEG-TS (188/204 bytes) over ASI (x8) - BNC connectors, 75 Ω
- o MPEG-TS (RTP/UDP) over IP - 2 x RJ45 1GigE & 2 x RJ45 10GigE
- o IP Datagram (RTP/UDP) using GSE-Lite (HEM) over 1/10GigE
- o Flexible redundancy between these inputs ASI & Ethernet
- o Flexible bit rate adaptation
    - PCR adaptation (MPEG-TS)/Padding/Dummy frame
- o Encryption 0.25 to 200 Mbps available over ASI in Single Stream
    - BISS (single/multiple programs): mode 0,1, E

■ Process
- o DVB-S2/S2X Multistream up to 8 ISI selected between:
    - 8 MPTS over ASI,
    - 8 MPTS over 4 ports Ethernet.
- o DVB-S2/S2X Annex M up to 2Gbits/s.

■ RF Outputs
- o L-Band: 950 MHz to 2150 MHz, step 1 Hz
   N 50 Ω / +0dBm / -35dBm, step 0.1 dB
- o SNR > 40 dB @ 0 dBm -16 APSK - 200 Mbaud
- o Shoulders rejection < -50dB @ 0dBm & f/fN=1.5 for roll off 20%
- o Spurious: < -65 dBc/4KHz @ 0 dBm for 950 to 2150 MHz range
                 -60 dBc outside the useful band
- o Phase noise:
   - @10Hz   < -55 dBc/Hz
   - @100Hz   < -70 dBc/Hz
   - @1KHz   < -80 dBc/Hz
   - @10KHz   < -90 dBc/Hz
   - @100KHz   < -100 dBc/Hz
   - @1MHz   < -120 dBc/Hz
- o Switchable 10MHz insertion on L-Band RF output:
   - @1Hz   < -85 dBc/Hz
   - @10Hz   < -115 dBc/Hz
   - @100Hz   < -140 dBc/Hz
   - @1kHz   < -145 dBc/Hz
   - @10kHz   < -150 dBc/Hz
   - @1MHz   < -150 dBc/Hz

■ Static Pre-Correction
- o Static Linear pre-correction
    - Transponder characterized by its Amplitude/Group delay curves.
- o Static Non Linear pre-correction
    - Transponder characterized by its AM/AM & AM/PM curves.

■ Clock & Synchronization
- o Internal 10 MHz Reference Frequency
    - HIGH STABILITY: +/- 5 ppb over 0 to 70° C
    - Ageing: +/- 0.05 ppb/day - +/- 7.5 ppb/year
- o External 10 MHz input for RF synchronization

■ Modulation
- o DVB-S2:
    - Outer/Inner FEC: BCH/LDPC
    - QPSK: 1/4, 1/3, 2/5, 1/2, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
    - 8PSK: 3/5, 2/3, 3/4, 5/6, 8/9, 9/10
    - 16APSK: 2/3, 3/4, 4/5, 5/6, 8/9, 9/10
    - 32APSK: 3/4, 4/5, 5/6, 8/9, 9/10
    - PL Scrambling codes [0, 264143]
    - Supported DVB modes:
        - CCM: Constant Coding and Modulation,
        - VCM: Variable Coding and Modulation,
        - *SeamlessACM*: Adaptive Coding and Modulation
    - DVB-S2 Short (16 200) Normal (64 800) frames:
    - Pilots ON or OFF
    - Variable symbol from 1 to 480 Mbaud, step 1 Baud
- o **DVB-S2X**
    - Same features as defined for DVB-S2
    +
    - All New constellation: 64/128/256APSK
    - All new linear MODCOD

■ Control & Monitoring
- o SNMP (V2C) and Web Interface Control & Monitoring:
    with 2 x 10/100/1000 base-T Ethernet ports,
- o Keyboard and display on the front panel,
- o RS232 control port with SCPI protocol,
- o Alarm relays - connector 9-pin sub-D (F),
- o Dry contact management for 1+1 redundancy.

■ Physical
- o Power supply: 90 to 240 VAC - 100W
- o Dimensions: 483 x 376.5 x 43.8 (LxlxH)
- o Weight: 8 kg
- o Temperature: 0°C to 50°C

Order Information

XSSR-TYG0-3000	WideBand (500MHz) S2/S2X Modulator - GSE-Lite - 10GigE - L-Band output - 1U Rack
XSSO-TYGX-WBAM	DVB-S2/S2X Annex M - Software option
XSSO-TYG0-BISE	BISS-0/1/E Encryption license - Software option

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

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