Vyper is a state-of-the-art satellite modulator designed for applications over satellite in full compliance with the DVB-S, DVB-DSNG, DVB-S2 and DVB-S2X standards. One single hardware platform covers the full L-Band range (950/2150 MHz) and IF Band range (50/180 MHz) with a Symbol Rate from 0.05 to 80 MBaud. It is also able to drive a Block Up Converter (BUC) thanks to its high stability 10MHz reference available on the L-Band RF output signal and a DC (24VDC or 48VDC) component (see ordering information).

Vyper offers a data rate from 0.25 Mbps up to 200 Mbps and content aggregation of up to 4 MPEG-TS multiplex in one satellite carrier via the Multistream feature as defined in the DVB-S2/S2X standard. Our product is compliant with latest Carrier ID requirements defined in ETSI 103 129.

Vyper proposes a very flexible input redundancy between 4 TSoASI and/or 4 TSoIP. The TSoIP redundancy is done between either the both physical Ethernet ports Data 1 & Data 2 and/or the 4 logical IP addresses. To monitor these inputs, Vyper proposes a ASI output where any MPEG-TS over ASI and Ethernet inputs can be selected. A double PSU redundancy is also available.

Vyper includes the DVB-S2X Broadcast and DSNG profiles (128/256APSK up to request). It means that Vyper supports all new MODCOD & the 64 APSK constellation. The new roll off (from 5% to 15% by step of 1%) are available with any satellite standards DVB-S included.

The Enchanced Satellite Precorrection (E.S.P) is designed to compensate the possible imperfections of embedded filters and amplifiers of the satellite. Depending on the use case (MODCOD selected, satellite characteristics) E.S.P can increase the performance gains, as budget link margin, as coverage, on full transponder satellite links. An automated E.S.P is possible with our dedicated demodulator used for transponder characterization (contact support@enensys.com for more detail).

Performance & Reliability

Vyper has been designed to meet all ETSI EN 302 307 requirements: part I for DVB-S2 and part II for DVB-S2X. All modes of bit rate adaptation are possible: PCR adaptation, Padding insertion and Dummy PL Frame insertion resulting in Vyper’s unique automatic flexible rate adaptation. Vyper offers a flexible baudrate from 0.05 MBaud to 80 MBaud to cover radio up to 8K video transmissions with the same product. An internal PRBS generator can be used to generate a RF spectrum without any valid signal input. Vyper offers, without option, the possibility to receive the incoming MPEG-TS stream either over ASI (x4) or Ethernet inputs (x2). A local redundancy is available between the MPEG-TS over ASI and MPEG-TS over IP.

Vyper integrates the core technology required to perform high quality modulation based on TEAMCAST expertise. It provides customers with a best in class performance, providing a high SNR value, excellent shoulder levels and lowest phase noise. Vyper 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 modulation: DVB-S/DVB-DSNG/DVB-S2 and of course for DVB-S2X. This results gives an efficient transmission in 32APSK (DVB-S2/S2X) and 64APSK (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, selection of DVB-S, DVB-DSNG, DVB-S2 and DVB-S2X, modulation type (MODCOD) 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).
Specifications

Standards
- DVB-S: EN 300 421
- DVB-S2: EN 300 421
- Carrier ID: ETSI 103 129
- MPEG-TS: ISO/IEC 13818-1
- DVB-MPEG-TS overASI: EN50083-9, ETSI TR 101 891
- DVB-MPEG-TS overIP: ETSI TR 102 034
- MPEG-2 PSI Tables (PAT and PMT): EN 300 468

Inputs
- MPEG-TS (188/204 bytes) overASI (x4) - BNC connectors, 75 Ω
- MPEG-TS (RTP/UDP - SMPT-E2022) over 2 dedicated RJ45 ports
- Multistream up to 4 ISI selected between:
  - 4 MPTS overASI and/or over Ethernet.
- Bitrate adaptation: PCR, Padding insertion, Dummy PL frames.
- BISS Encryption (single/multiple programs): mode 0, 1, E

Output
- MPEG-TS (188/204 bytes) overASI (x1) - BNC connectors, 75 Ω

RF Outputs
- L-Band output, connector N 50 Ω:
  - 950 MHz to 2150 MHz, 1 Hz steps
- Power level: -35dBm to +7dBm, 0.1 dB steps
- IF-Band, connector BNC 75 Ω:
  - 50 MHz to 180 MHz, 1 Hz steps
  - Power level: -35dBm to +5dBm, 0.1 dB steps
- Phase noise L-Band IF Band
  - @10Hz: -80 dBc/Hz
  - @100Hz: -91 dBc/Hz
  - @1kHz: -106 dBc/Hz
  - @10kHz: -108 dBc/Hz
  - @100kHz: -106 dBc/Hz
  - @1MHz: -138 dBc/Hz
- SNR: > 40 dB over 0 dBm -16 APSK - 30 Mb/s
- Shoulders rejection < 50dB @ 0dBm & f/fN=1.5 for roll off 20%
- Spurious: (-60 dBc outsidethe useful band)
  - < -65 dBc @ 0 dBm for 50 to 180 & 950 to 2150 MHz
- Noise Power Spectral Density: <=-120 dBc/Hz
- Switchable 10 MHz insertion on L-Band RF output:
  - @10Hz < -85 dBc/Hz
  - @10kHz < -105 dBc/Hz

BUC Power (with Switchable 10 MHz)
- Max. current: 4A
- Voltage: 24 Volt or 48 Volt

Clock & Synchronization
- Internal 10 MHz Reference Frequency
  - High stability: ±5.10^-9 over 0 to 70° C
  - Ageing: ±0.5.10^-9/day and ±7.5.10^-9/year
- External 10 MHz input for external clock synchronization

Modulation
- Symbol rate: 0.05 to 80 Mbaud (1 Baud steps)
- Standard roll-off and custom roll-off from 5 to 35 % (1% steps)
- DVB-S / DSNG:
  - BISS-0/1/E Encryption license - Software option
- DVB-S2:
  - 50 MHz to 180 MHz, 1 Hz steps
  - Power level: -35dBm to +7dBm, 0.1 dB steps
  - Phase noise L-Band IF Band
  - @10Hz: -80 dBc/Hz
  - @100Hz: -91 dBc/Hz
  - @1kHz: -106 dBc/Hz
  - @10kHz: -108 dBc/Hz
  - @100kHz: -106 dBc/Hz
  - @1MHz: -138 dBc/Hz
  - SNR: > 40 dB @ 0 dBm -16 APSK - 30 Mb/s
- Shoulders rejection < 50dB @ 0dBm & f/fN=1.5 for roll off 20%
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- Switchable 10 MHz insertion on L-Band RF output:
  - @10Hz < -85 dBc/Hz
  - @10kHz < -105 dBc/Hz

Enhanced Satellite Precorrection (E.S.P.)
- Static Non Linear precorrection
- Static Linear precorrection
  - Note: Automated E.S.P possible with Neptune

Control & Monitoring
- RS232 control port with SCPI protocol
- 2 dedicated Ethernet ports for:
  - SNMP (V2C) over Ethernet
  - HTTP over Ethernet (Embedded web client)
- Front panel keyboard & display

Redundancy
- 1+1/N+1 redundancy Ethernet ports (x2) for Control
- 1+1/N+1 redundancy Ethernet ports (x2) for Data
- 1+1 redundancy RF signal with Alarm relays:
  - connector 9-pin sub-D (F)
  - Dry contact management

Specifications subject to change

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 Specifications are not contractual and are subject to revision without notice. *See ordering information

Ordering Information

Hardware configuration:

- XSSR-VYPO-3000: S/52/SX2 Satellite modulator - IF and RF output -+7/-35dBm - 4 Eth ports - 1U Rack
- XSSR-VYPO-3001: S/52/SX2 Satellite modulator - 2 PSU - IF and RF output -+7/-35dBm - 4 Eth ports - 1U Rack
- XSSR-VYPO-3010: S/52/SX2 Satellite modulator - BUC 24VDC - IF and RF output -+7/-35dBm - 4 Eth ports - 1U Rack
- XSSR-VYPO-3020: S/52/SX2 Satellite modulator - BUC 48VDC - IF and RF output -+7/-35dBm - 4 Eth ports - 1U Rack

Software options

- XSSO-VYPO-S2XR: DVB-S2X standard - Broadcast & DSNG profiles - Software option
- XSSO-VYPO-BISE: BISS-0/1/E Encryption license - Software option
- XSSO-VYPO-ESPO: Enhanced Satellite Precorrection Linear & Non-linear - Software option