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Very High Speed Modem

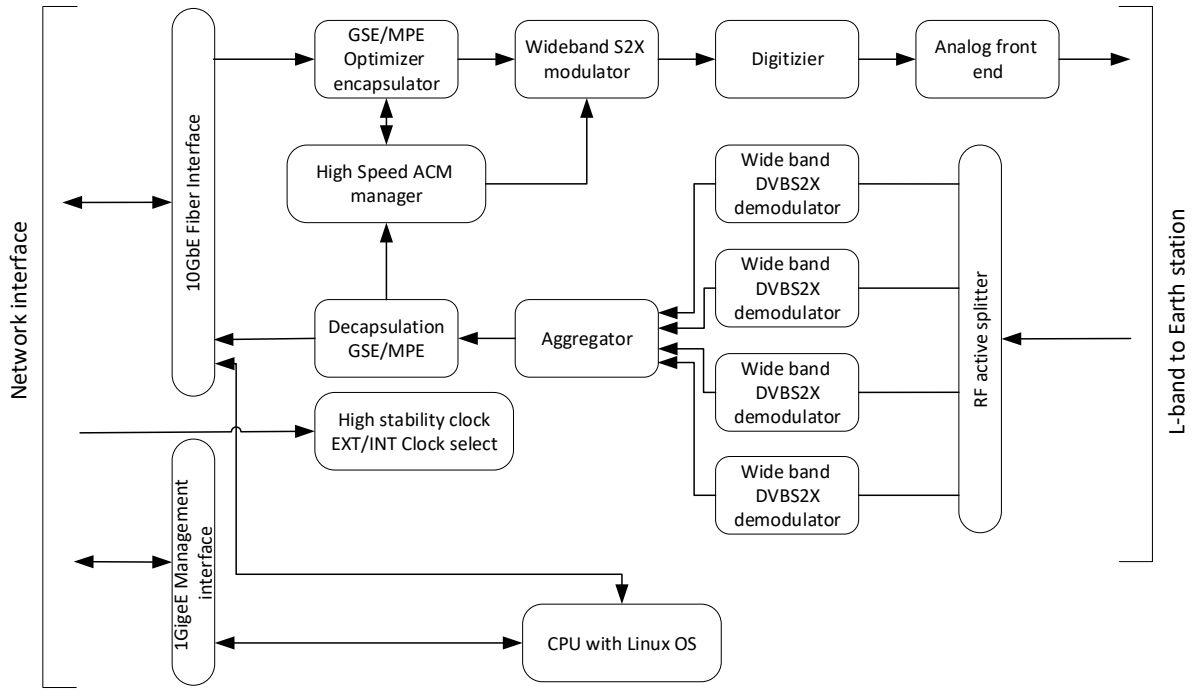
The SM-VHS-500 is a very high speed, DVB-S2X satellite modem, supporting up to 460Msps, with time slicing, and up to 2Gbps data delivery rates

The modem is designed for operation with GEO to LEO satellites. The modem is provided as a 19" standard rack mount equipment, and as an IPcore for on board platforms, in case of LEO satellite.

The modem is designed to operate with a fast-fading link, and includes an integrated point to point ACM system, supporting up to 2dB/sec fading rate.

1. General Overview

Block Diagram



The SM1x offers GigE data interface and Hardware based packet processing to assure high bit rate and high packet rate.

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Highlights

Product Highlights

- Wide Band Modem- Up to 460Msps
- DVB-S2x, EN 302 307-2, Annex-M
- Local management - Virtual front panel running as an Application on a touch screen (Smartphone, Tablet, PC), via USB interface.
- Support up to 2Gbps, bidirectional (4Gbps integrated)
- Over 1MPPS per direction (over 2MPPS integrated)
- High-rate ACM messages to operate in LEO latency
- Operate in high Doppler rate
- L2, L3 operation modes
- Advanced AUPC based on current traffic
- Seamless Handover for non-GEO
- GSE/MPE encapsulation
- Roll-off 0.35, 0.25, 0.20, 0.10 and 0.05
- Modulation up to 256APSK (including optimization for quasi-linear channels)
- L-Band interfaces in Rx and Tx
- Multiple control interfaces – SNMP, Rest, gRPC
- Available as Modulator or Demodulator only
- Space Version: Available as a Firmware + Software for Xilinx Ultrascale+ SoC (Narrowband S2x Rx)

Specifications

Standard Compliance	
Waveform	DVBS2, DVBS2X, DVBS2X Annex-M
Encapsulation	GSE ETSI TS 102 606, ETSI TS 102 771 MPE ETSI EN 301 192
Transport Layer streaming	BBFrames over UDP Comply with ESA / Sat labs L.3 protocol
FEC	Coding LDPC and BCH decoder as for DVB-S2x

Networking & Management	
Operating System	Linux
Management port	10/100/1000 BaseT, RJ45
Management Protocol	gRPC according to supplied protobuf definition
Software & Firmware upgrade	Over the air image management (based on Flute protocol), and field upgradeable using TFTP
Traffic port	10GbE, Fiber optic
Satellite network synchronization	NCR insertion and regeneration
Packet processing	Network processing - QoS, VLAN to MODCOD mapping (optional)
L2 and L3 operation	Packet forwarding based on Ethernet (L2) header or IP header (L3) at full throughput
Multicast	Supported up to full modem speed
Flow control	Pause frames
Packet size	Jumbo frames
IP address	Manual or DHCP
Security	Management port Independent or combined with Traffic port for enhanced security
Integration with VSAT Hubs	MPEG-TS over IP to integrate with external PSI/SI server
User UI	HTTP web based, Web server running on unit, serving web UI on standard browser.
Performance	
Symbol rate range	Symbol Rates 5Msps to 460Msps
Sustainable throughput	Wire Speed - over 1MPPS each direction (2MPPS bi directional), 2Gbps each direction (4Gbps bidirectional)
ACM rate	2dB/sec
Special Features	
Channel optimizer	Advanced GSE VCM optimizer for high channel utilization and minimization of padding

Ka band fading compensation	ACM messages rate – up to 100 messages per second
Transponder power optimization	AUPC – Automatic Uplink power control based on incoming traffic to minimize transponder power consumption (optional)
Transmitter	
Frequency band	950 – 2150 MHz
Frequency step	1KHz
Output power	-30dBm to 0dbm in 0.1dB steps
Output port return loss	➢ 10dB
Roll off factors	0.05,0.1,0.15,0.2, 0.25, 0.35
Transmit connector	N-Type, female, 50Ohms
BUC power and 10MHZ	Not supported
Output Spectrum	< 55 dBc/4kHz, modulated carrier Excludes spectral mask area
Phase noise	Better than IESS-316
Power OFF	Better than 50dB down
Flatness	+/- 0.5 dB over any 36MHz band, +/- 2dB over the full band
Receiver	
Roll off factors	0.05,0.1,0.15,0.2, 0.25, 0.35
Frequency band	950 – 2150 MHz
Frequency step	1KHz
Transmit connector	N-Type, female, 50Ohms
LNB power and DiseqC	Not supported
Input signal range	-30 to -60 dBm
Max composite signal level	0dBm
Auto detect	Automatic detection of the symbol rate and MODCOD (for symbol rates above 1Msps) For lower symbol rates value must be configured
Reporting	Frequency, Symbol rate, Annex-M, MODCOD, SNR,

	Eb/No, ISI.
Environmental, physical & power	
Operating temperature	0° to 50° C
Storage temperature	-25° to +85° C
Humidity	5% to 95% non-condensing
Size	Rack mount 2U 19" 60 cm deep. < 10Kg
Certifications	TUV/c TUV/us; CE, UL/NRTL EMI/EMC FCC part 15, Class B, EN 55022,
Input power	100V - 240V 300W