

Challenge Series

Satellite High Speed DVB-S2 IP Modem

SK-IP



CCM, VCM, ACM Functionality

The satellite high speed DVB-S2 IP modem SK-IP provides a platform for transferring IP/Ethernet data over DVB-S2 satellite connections. Ethernet frames and IP packets are encapsulated directly within DVB-S2 base band frames, which results in low encapsulation overhead. In combination with the integrated OptiACM controller the modem provides adaptive or variable FEC- and modulation setting for point-to-point or point-to-multipoint applications.

The modulator provides the modulated signal at 70/140 MHz IF or at L-band. With the L-band output also a 10 MHz reference signal for a block-upconverter can be enabled on the TX port.

The demodulator accepts an L-Band signal in the range from 950 to 2150 MHz on two inputs or alternatively an IF signal in the range from 50 to 180 MHz on a single input. On L-Band devices LNBS can be powered directly over the inputs.

QPSK, 8PSK, 16APSK, 32APSK modulation is supported, which allows big flexibility in the satellite link design.

Operating and control – easy integration into your system

The modem can be operated via the push buttons on the front panel using self-explanatory display menus or via remote control (RS232, RS422/485, TCP/IP (over Ethernet)). For the remote control either addressable packet based commands, a WEB interface (HTTP web browser interface) or SNMP can be used. Detailed monitoring of system parameters is possible

Key features

- DVB-S2 satellite modem for IP/Ethernet data transmission.
- DVB-S2 compliant (EN 302 307)
- QPSK / 8PSK / 16APSK / 32APSK modulation
- Normal and short FEC frames, pilots on or off
- Physical layer framing (PL descrambling with codes 0..262141) according to DVB-S2 standard
- Symbol rates from 60 ksps to 60 Msps
- OptiACM system (programmable or automatic) for optimized bandwidth usage
- Gigabit Ethernet data interface
- Generic Stream Encapsulation (GSE) direct to DVB-S2 base band frames
- Operates as Layer 2 Bridge, Layer 3 Bridge or Layer 3 Router
- Remote control through RS232, RS422/485 (2-wire or 4-wire) interfaces, TCP/IP over Ethernet, Web browser interface, SNMP (MIBs are provided)
- 10 MHz Reference OCXO included
- Summary alarm output (dual change over switch contacts)
- Operating temperature range 0 °C to 50 °C (32 °F to 122 °F)
- CE compliant
- **3 years warranty**

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Modulator Part of Modem Type:	SK-IP-V-50-x-x / SK-IP-V-75-x-x	SK-IP-L-50-x-x / SK-IP-L-75-x-x
IF-Output Frequency:	50...180 MHz	950...2150 MHz
Frequency Resolution:	1 Hz	1 Hz
Phase Noise:		
10 Hz	- 70	- 65
100 Hz	- 80	- 75
1 kHz	- 88	- 88
10 kHz	- 90	- 90
100 kHz	- 100	- 100
1 MHz	- 115	- 115
	max. values in dBc/Hz	
IF-Output Characteristics:	Impedance: 50 Ω or 75 Ω Return Loss: > 20 dB Output Power: -25 dBm ... +5 dBm, 0.1 dB steps, ±0.5 dBm accuracy Output Power muted: < -85 dBm Connector: BNC female	Impedance: 50 Ω or 75 Ω Return Loss: > 20 dB Output Power: -30 dBm ... 0 dBm, 0.1 dB steps, ±0.5 dBm accuracy Output Power muted: < -85 dBm Connector: SMA female (50 Ω) F female (75 Ω) 10 MHz reference output on IF output: 1.5 ±1.5 dBm (can be switched on/off)
Spurious Outputs:	Signal related: < - 70 dBc, unmodulated carrier, 50...90 MHz or 100...180 MHz < - 45 dBc, unmodulated carrier, out of band	Signal related: < - 70 dBc, unmodulated carrier, 950...1900 MHz < - 55 dBc, unmodulated carrier, 1900...2150 MHz < - 45 dBc, unmodulated carrier, out of band
Frequency and Clock Stability	± 5 x 10 ⁻⁸ (-30°C to 60°C), aging: ± 1 x 10 ⁻⁹ per day, ± 1 x 10 ⁻⁷ per year	
Symbol Rate:	Max. Range: 60 ksps – 60 Msps (depending on firmware option) Step size: 1 sps	
Modulation / Coding DVB-S2:	Outer BCH Code: FEC-Frames nldpc = 64800 (normal FEC Frame) nldpc = 16200 (short FEC Frame) Inner LDPC Code: 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 Physical Layer Framing: yes Physical Layer Signalling: yes Pilots Insertion: on / off Physical Layer Scrambling: N = 0...262141 all according EN 302307	

Demodulator Part of Modem Type:	SK-IP-x-x-V-50 / SK-IP-x-x-V-75	SK-IP-x-x-L-75
IF-Input Frequency:	50...180 MHz	950...2150 MHz
IF-Input Characteristics:	Impedance: 50 Ω or 75 Ω Return Loss: >18 dB Input Power: -60 dBm ... -15 dBm IF-Connector: BNC female LNB DC-Feed: n/a	Impedance: 75 Ω Return Loss: >13 dB Input Power: -70 dBm ... -20 dBm IF-Connector: 2x F female, input selectable LNB DC-Feed: 13.5V / 450mA or 18V / 450mA switchable, 22 kHz tone on/off, short circuit protected
Symbol Rate:	Max. Range: 60 ksps - 60 Msps (QPSK, 8PSK) 60 ksps - 45 Msps (16APSK) 60 ksps - 40 Msps (32APSK) Step size: 1 sps	
Demodulation / Decoding DVB-S2:	Outer BCH Code: FEC-Frames nldpc = 64800 (normal FEC Frame) nldpc = 16200 (short FEC Frame) Inner LDPC Code: 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 Demodulator auto detection: Modulation- and FEC-type, pilots on/off are automatically detected Physical Layer Scrambling: N = 0...262141 all according EN 302307	

Specifications continued next page

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Specifications continued:

Common Parameters:	SK-IP-x
OptiACM:	CCM / VCM / ACM functionality for point-to-point and point-to-multipoint links 16 ACM channels with separate MODCOD range and Es/N0 sensitivity ACM channels arbitrary assignable to baseband channels
Signal Spectrum Mask:	$\alpha = 0.35, 0.25, 0.20$ according EN 302307
Data Interface:	Ethernet (1xRJ-45, 10/100/1000 Mbit/s auto sensing)
Data Rate:	up to 160 Mbit/s (Layer 2 Mode) up to 128 Mbit/s (Layer 3 Mode)
Network Operation:	Layer 2: Bridge (Ethernet frame transmission) STP/RSTP Layer 3: Bridge/Router (IP packet transmission) 256 IP/subnet routes per port 16 DVB-S2 baseband channels
Data Encapsulation:	Generic Stream Encapsulation (GSE) according TS 102606
Monitoring and Control Interface:	Protocol: SNMP Connection: UDP over Ethernet (10 or 100 Mbit/s, auto sensing), connector RJ-45 Protocol: HTTP (web browser interface) Connection: TCP/IP over Ethernet (10 or 100 Mbit/s, auto sensing), connector RJ-45 Protocol: Multipoint Connection: RS232 or RS422/RS485 (configurable), connector DSUB09 female or TCP/IP over Ethernet (10 or 100 Mbit/s, auto sensing), connector RJ-45
Alarm Interface: Mute Input:	Alarm: two potential free contacts (DPDT), Mute Input: TTL logic input with internal pull up Connector DSUB09
Temperature Range:	0°C to 50°C operating -30°C to 80°C storage
Relative Humidity:	< 95% non condensing
User Interface:	LCD-Display 2 x 40 characters, 4 cursor keys, 4 function keys
Power Input:	85...264 V AC, 40...70 Hz, appr. 40 W / 55 VA
Mains Fuse :	2 x 2 A time-lag fuse
Dimension and Weight:	483 x 44 x 270 mm ³ , 1 RU (19") appr. 5.5 kg

Specifications are subject to change

Order Information:

SK-IP-[Output Band]-[Output Imp]-[Input Band]-[Input Imp]-[Modulator Firmware Option]

Examples:

- SK-IP-L-50-L-75-A2H
- SK-IP-L-50-V-75-P2N
- SK-IP-V-50-V-50-A2L

Modulator Firmware Option	Max Symbol Rate, Supported Modulation Types
- P2L	15 Msps, QPSK / 8PSK
- P2N	30 Msps, QPSK / 8PSK
- P2M	45 Msps, QPSK / 8PSK
- P2H	60 Msps, QPSK / 8PSK
- A2L	15 Msps, QPSK / 8PSK / 16APSK / 32APSK
- A2N	30 Msps, QPSK / 8PSK / 16APSK / 32APSK
- A2M	45 Msps, QPSK / 8PSK / 16APSK / 32APSK
- A2H	60 Msps, QPSK / 8PSK / 16APSK / 32APSK



Trade Mark of the DVB Digital Video
Broadcasting Project