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SM1ProX

An IP over satellite modem with full support of DVB-S2/X, integrates both encapsulator and modem. The SM1ProX supports advanced modulation modes of the DVBS2 and DVBS2X up to 256APSK. The SM1ProX Data processing is performed by AYECKA's Hardware processing acceleration core, thus providing full line rate, with no PPS limitations. The SM1ProX incorporates an ARM based Linux system, for advanced UI, and remote control, providing built in Webserver, and potentially for running additional applications. The device is configured in a new small form factor Chassis. The device has two receive ports, and provide the required signals to operate a BUC and a LNB.



Product Highlights

- DVB-S2/X Modem with support down to 5% roll off, ACM, VCM
- Modulations from QPSK to 256APSK
- From 100Ksps up to 60Msps in transmit direction
- Receive can go up to 460Msps, Compliant to Annex-M
- Dual RX ports
- Wire speed processing of traffic – full hardware implementation. No PPS limitation.
- Up to 324Mbps on the receive direction^{Note1}
- Embedded ACM manager for P2P. High ACM rate to support Ka Band
- Flow control for efficient channel use in ACM
- GSE encapsulation (a Version with BBFRAME interface is also available)
- Optional: NCR insertion in Tx and Lock in Rx
- Advanced GSE VCM optimizer for high channel utilization
- BUC power drive – 24V up to 4.5Amps
- LNB power – 13/18V and 22KHZ On/Off
- Supports L2
- Fast lock time and Re-lock time for SOTM

- Based on AYECKA reliable hardware design in use by thousands of devices
- Advanced web UI

Note1: This requires that the modulator is provided by AYECKA, and that it supports Annex-M. Please refer to SM-VHS-500 product, for providing the high-speed modulation, supporting the 324Mbps and up to 2Gbps.

Applications

- Point to point and point to multiple point links
- Cellular backhauling
- Back up links for Fiber networks
- Data broadcast and multicast over satellite
- DSNG contribution
- Radio over satellite broadcast
- HD surveillance video delivery over satellite
- Special mission with BBFRAME interface

Product Specifications

DVB-S2X Modulator

| | |
|-------------------------|---|
| Standard | Fully compliant with ETSi EN 302 307 |
| DVB-S2 Modes | CCM, VCM and ACM modes |
| Modulation | QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK |
| Symbol rates | 100Ksps to 60Msps |
| Throughput | Up to 220Mbps |
| Roll off factors | 0.05,0.1,0.15,0.2,0.25,0.35 |
| Coding | LDPC and BCH according to DVBS2 |
| Code rates | 1/4, 1/3, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 and additional rates of S2X, refer to detailed table |
| Framing | Short and Normal |
| DVBS2 Pilots | On / Off |
| Frequency range | 950 – 2150 MHz |
| Signal level | 0 to -40 dBm, |
| RF connector | Type F, 75Ohm |
| Spurious level | <-55dBc/4KHz |
| Phase Noise | Better than IESS-316 |
| Reference Clock | 10MHz internal, stability \pm 1ppm |
| External Clock | By configuration |
| Return loss | >10dB |
| TX power off | >50dB |
| Flatness | \pm 0.5dB over any 36MHz band \pm 2dB over the full band |

DVB-S2X Demodulator

| | |
|---------------------------|---|
| Standard | Fully compliant with ETSi EN 302 307 |
| DVB-S2 Modes | CCM, VCM and ACM modes |
| Modulation | QPSK, 8PSK, 16APSK, 32APSK, 64APSK, 128APSK, 256APSK |
| Symbol rates | 100Ksps to 460Msps |
| Throughput | Up to 324Mbps |
| Roll off factors | 0.05,0.1,0.15,0.2,0.25,0.35 |
| Coding | LDPC and BCH according to DVBS2 |
| Code rates | 1/4, 1/3, 3/5, 2/3, 3/4, 4/5, 5/6, 8/9, 9/10 and additional rates of S2X, refer to detailed table |
| Framing | Short and Normal |
| DVBS2 Pilots | On / Off |
| Frequency range | 950 – 2150 MHz |
| Signal Sensitivity | -158 +10log10(Symbol rate)+Es/No |
| Max input signal | 0dBm |
| RF connector | Type F, 75Ohm |
| Return loss | >10dB |

IP encapsulation / Decapsulation

| | |
|-----------------------|------------------------------|
| GSE | Based on ETSI TS 102 606 and |
| VLAN filtering | On Tx direction |

Traffic Interface

| | |
|------------------|-------------------|
| Interface | 10/100/1000 BaseT |
| Network | L2 |

Control & Monitor

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|--------------------|--|
| Serial port | Serial over USB CLI |
| IP | REST API for external configuration and monitoring detailed API to be provided by request |
| Upgrade | SW and FW field upgradeable |

Standards compliance

| | |
|----------------|-----------------------------|
| Safety | CE |
| EMI/EMC | FCC part 15, Class A |
| Upgrade | SW and FW field upgradeable |

Physical Characteristics

| | |
|--|-----------------------------------|
| Dimensions (Excluding connectors) | Small form factor 20x16x4.3 cm |
| Power | 24VDC, 12W |
| BUC power | 24V/4.5A |
| LNB Power | 13/18V / 0.5A |
| Weight | 1Kg |

Environmental Conditions

| | |
|------------------------------|--------------------------|
| Operating temperature | 0° to 50° C. |
| Storage Temperature | -25° to +85° C. |
| Humidity | 5% to 95% non-condensing |

Supported MODCODS

DVB-S supported rates: $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{6}$, $\frac{7}{8}$

DVB-S2 ModCodes

| # | Mode | # | Mode | # | Mode | # | Mode |
|---|----------|----|-----------|----|-------------|----|---------------|
| 1 | QPSK 1/4 | 9 | QPSK 5/6 | 17 | 8PSK 9/10 | 25 | 32APSK 4/5 |
| 2 | QPSK 1/3 | 10 | QPSK 8/9 | 18 | 16APSK 2/3 | 26 | 32APSK 5/6 |
| 3 | QPSK 2/5 | 11 | QPSK 9/10 | 19 | 16APSK 3/4 | 27 | 32APSK 8/9 |
| 4 | QPSK 1/2 | 12 | 8PSK 3/5 | 20 | 16APSK 4/5 | 28 | 32APSK 9/10 |
| 5 | QPSK 3/5 | 13 | 8PSK 2/3 | 21 | 16APSK 5/6 | 29 | Reserved |
| 6 | QPSK 2/3 | 14 | 8PSK 3/4 | 22 | 16APSK 8/9 | 30 | Reserved |
| 7 | QPSK 3/4 | 15 | 8PSK 5/6 | 23 | 16APSK 9/10 | 31 | Reserved |
| 8 | QPSK 4/5 | 16 | 8PSK 8/9 | 24 | 32APSK 3/4 | 0 | DUMMY PLFRAME |

DVB S2x PLS Codes

| PLSCo de | Modulati on | Code Rate | Frame Length | PLS Cod e | Modulation | Code Rate | Code Rate |
|----------|-------------|-----------|--------------|-----------|------------|-----------|-----------|
| 132 | QPSK | 13\45 | Normal | 194 | 64APSK | 4\5 | Normal |
| 134 | QPSK | 9\20 | Normal | 198 | 64APSK | 5\6 | Normal |
| 136 | QPSK | 11\20 | Normal | 200 | 128APSK* | 3\4 | Normal |
| 138 | 8APSK | 5\9-L | Normal | 202 | 128APSK* | 7\9 | Normal |
| 140 | 8APSK | 26\45-L | Normal | 204 | 256APSK* | 29\45-L | Normal |
| 142 | 8PSK | 23\36 | Normal | 206 | 256APSK* | 2\3-L | Normal |
| 144 | 8PSK | 25\36 | Normal | 208 | 256APSK* | 31\45-L | Normal |
| 146 | 8PSK | 13\18 | Normal | 210 | 256APSK* | 32\45 | Normal |
| 148 | 16APSK | 1\2-L | Normal | 212 | 256APSK* | 11\15-L | Normal |
| 150 | 16APSK | 8\15-L | Normal | 214 | 256APSK* | 3\4 | Normal |
| 152 | 16APSK | 5\9-L | Normal | 216 | QPSK | 11\45 | Short |
| 154 | 16APSK | 26\45 | Normal | 218 | QPSK | 4\15 | Short |
| 156 | 16APSK | 3\5 | Normal | 220 | QPSK | 14\45 | Short |
| 158 | 16APSK | 3\5-L | Normal | 222 | QPSK | 7\15 | Short |
| 160 | 16APSK | 28\45 | Normal | 224 | QPSK | 8\15 | Short |
| 162 | 16APSK | 23\36 | Normal | 226 | QPSK | 32\45 | Short |
| 164 | 16APSK | 2\3-L | Normal | 228 | 8PSK | 7\15 | Short |
| 166 | 16APSK | 25\36 | Normal | 230 | 8PSK | 8\15 | Short |
| 168 | 16APSK | 13\18 | Normal | 232 | 8PSK | 26\45 | Short |

| | | | | | | | |
|-----|--------|---------|--------|-----|--------|-------|-------|
| 170 | 16APSK | 7\9 | Normal | 234 | 8PSK | 32\45 | Short |
| 172 | 16APSK | 77\90 | Normal | 236 | 16APSK | 7\15 | Short |
| 174 | 32APSK | 2\3-L | Normal | 238 | 16APSK | 8\15 | Short |
| 178 | 32APSK | 32\45 | Normal | 240 | 16APSK | 26\45 | Short |
| 180 | 32APSK | 11\15 | Normal | 242 | 16APSK | 3\5 | Short |
| 182 | 32APSK | 7\9 | Normal | 244 | 16APSK | 32\45 | Short |
| 184 | 64APSK | 32\45-L | Normal | 246 | 32APSK | 2\3 | Short |
| 186 | 64APSK | 11\15 | Normal | 248 | 32APSK | 32\45 | Short |
| 190 | 64APSK | 7\9 | Normal | | | | |

Ordering information

| AYECKA part number | Product name | Description |
|--------------------|--------------|---|
| AY6002 | SM1ProX | High performance Satellite DVBS2X Modem |