X Band Transceiver
SDR for Small Satellites

→ physical layer according to CCSDS ←
→ optional high speed proprietary physical layer ←

Applications

- SDR high speed data links
- Micro, nano or pico satellite usage
- Bidirectional communication links
- Downlink / TM & Payload 25 Mbps+
- Uplink / Tele-command 64 kbps+

**XLink** is an advanced transceiver system (Software Defined Radio - SDR) for X band communication links of small satellites in LEO environment.

The mechanical dimensions fit for 1U CubeSat as well as for larger satellites. The radio interface and protocol are developed according to standard CCSDS protocols. Downlink data rates with net payload rates of 25 Mbps+ will be possible. Supported modulation schemes include BPSK, QPSK and higher order types of modulation with appropriate FEC encoding schemes.

Based on the general concept, even higher data rates of more than 100 Mbps may be feasible.

The satellite receiver (Uplink) used for telecommand purposes of the satellites is designed for a standard CCSDS BPSK with BCH coding at least 64 kbps. Alternative X band or S band uplink receiver frequencies are usable.

Adaptive modulation and coding schemes (AMC) are applicable to maximize data throughput.

A special feature of the XLink transceiver is the optional application of dual polarized antenna elements which could be used for MIMO (multiple input multiple output) signal processing to enable a higher radio channel capacity and/or redundancy.

**Features**

- Fully featured and transparent bidirectional X band transceiver (SDR)
- CCSDS compliant
- Flight grade tested design
- Compact case and low power consumption
- Extra flat patch antenna design matched to customer specific frequencies
- Low cost COTS design
- Short delivery time

**Key Specifications**

- X band TX operation: 8,025-8,500 MHz
- X band RX operation: 7,145-7,250 MHz
- Operational mode: FDD / Full duplex
- Data rate Sat2Ground: 25 Mbps+
- Data rate Ground2Sat: 64 kbps+
- Linear RF output power: up to +30 dBm (2x +27 dBm)
- Automatic Doppler shift compensation in Rx
- Low power consumption: up to 15 W (Rx+Tx)
- DC supply voltage: 7 – 18 V
- Ultra small volume: Fits into 1U
- Low mass: < 200 gram

**Applications**

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<table>
<thead>
<tr>
<th>Tentative Setting / Configuration</th>
<th>Optional Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tx Frequency Band</td>
<td>8.025 – 8.500 GHz</td>
</tr>
<tr>
<td>Data Rate (Tx Payload Data)</td>
<td>25 Mbps+</td>
</tr>
<tr>
<td>Data Rate (Rx Payload Data)</td>
<td>S band</td>
</tr>
<tr>
<td>Tx RF Bandwidth</td>
<td>8 MHz</td>
</tr>
<tr>
<td>Rx Frequency Band</td>
<td>7.145 – 7.250 GHz</td>
</tr>
<tr>
<td>Rx RF Bandwidth</td>
<td>100 kHz</td>
</tr>
<tr>
<td>Tx Modulation Scheme</td>
<td>BPSK, QPSK, 8PSK</td>
</tr>
<tr>
<td>Rx Modulation Scheme</td>
<td>BPSK</td>
</tr>
<tr>
<td>Connector type</td>
<td>SMP, 50 Ω</td>
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<td>SMP, 50 Ω</td>
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<tr>
<td>Connector type</td>
<td>3 x Nano-D-Sub (Power, Ethernet, Data &amp; I/O)</td>
</tr>
<tr>
<td>Data Interfaces</td>
<td>LVDS-SPI (2), IEEE 802.3 1000BASE-T</td>
</tr>
<tr>
<td>Applicable CCSDS Standards</td>
<td>CCSDS 231.0-B-2, 132.0-B-2, 131.2-B-1, 401.0-B-26</td>
</tr>
<tr>
<td>DC Power Consumption</td>
<td>&lt;15 W Tx, &lt;5 W Rx</td>
</tr>
<tr>
<td>Mechanical Dimensions</td>
<td>Fits into 1U CubeSat 90 x 65 x 28 mm³</td>
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<tr>
<td>Antenna configuration</td>
<td>2 x orthogonal polarization</td>
</tr>
<tr>
<td>Temperature range Operation</td>
<td>-20°C ... +50°C</td>
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<tr>
<td>Case</td>
<td>passivated aluminium</td>
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</table>

**Optional available Equipment**

- Tx/Rx X band patch antennas for satellite transceiver applications
- XLink ground station equipment (19” rack, 2HU transceiver with data interface)
- Customer specific designs and turn-key solutions

*Product specification may be subject to change without notification*