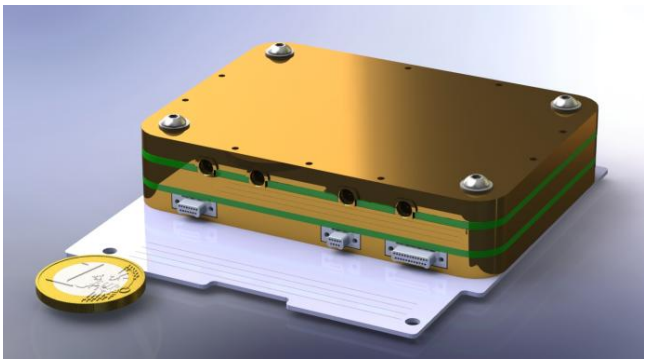
X Band Transceiver
SDR for Small Satellites

Rev.02/2018

➔ 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) up to 5 W (Rx)
• DC supply voltage:	7 – 18 V
• Ultra small volume:	Fits into 1U
• Low mass:	< 200 gram

IQ wireless GmbH, Carl-Scheele-Strasse 14, 12489 Berlin, Germany ISO 9001:2015 certified
Tel: +49(0)30 63 92 80 500 | Email: info@iq-spacecom.de | www.iq-wireless.com | www.iq-spacecom.de

	Tentative Setting / Configuration	Optional Configuration
Tx Frequency Band	8.025 – 8.500 GHz	
Data Rate (Tx Payload Data)	25 Mbps+	>100 Mbps
Tx RF Bandwidth	8 MHz	12 MHz
RF Power Output (w/o aerial)	Up to +30 dBm (2 channels each +27 dBm)	Higher output power with external PA possible
Tx Modulation Scheme	BPSK, QPSK, 8PSK	16APSK
Connector type	SMP, 50 Ω	User-Defined Jumper cable
Rx Frequency Band	7.145 – 7.250 GHz	S band
Data Rate (Rx Payload Data)	64 kbps+	Up to 256 kbps
Rx RF Bandwidth	100 kHz	
Rx Modulation Scheme	BPSK	
Connector type	SMP, 50 Ω	User-Defined Jumper cable
Data Interfaces	LVDS-SPI (2), IEEE 802.3 1000BASE-T	
Connector type	3 x Nano-D-Sub (Power, Ethernet, Data & I/O)	
Applicable CCSDS Standards	CCSDS 231.0-B-2, 132.0-B-2, 131.2-B-1, 401.0-B-26	
DC Power Consumption	<15 W Tx, <5 W Rx	Depends upon RF Power
Mechanical Dimensions	Fits into 1U CubeSat 90 x 65 x 28 mm³	
Antenna configuration	2 x orthogonal polarization	Custom specific antenna
Temperature range Operation	-20°C … +50°C	
Case	passivated aluminium	

XLink Product Specification

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

IQ wireless GmbH, Carl-Scheele-Strasse 14, 12489 Berlin, Germany ISO 9001:2015 certified
Tel: +49(0)30 63 92 80 500 | Email: info@iq-spacecom.de | www.iq-wireless.com | www.iq-spacecom.de