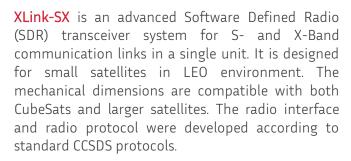# XLINK-SX

S- and X-Band Transceiver with SDR for Small Satellites ⇢ Physical Layer according to CCSDS

HIGHLIGHTS

- **SDR** high-speed data links
- CubeSat and Small Satellite usage
- Bidirectional communication links
- Downlink: TM or Payload up to **200 Mbps**
- Uplink: TC **>56 kbps**

DVB-S2 & CCSDS

XLink-SX is an advanced Software Defined Radio (SDR) transceiver system for S- and X-Band communication links in a single unit. It is designed for small satellites in LEO environment. The mechanical dimensions are compatible with both CubeSats and larger satellites. The radio interface and radio protocol were developed according to standard CCSDS protocols.

The device combines very high downlink data rates of up to 200 Mbps in X-Band with lower data rates for telemonitoring in S-Band. Supported modulation schemes include BPSK, QPSK and higher order modulations with appropriate FEC coding schemes. Adaptive Modulation and Coding (AMC) schemes are applicable to maximize data throughput.

The satellite receiver (uplink) for telecommand purposes is designed for standard CCSDS BPSK with BCH coding and net data rates of 56 kbps minimum. Alternatively, X-band or S-band uplink receive frequencies can be used.

The payload data interface is based on CCSDS transfer frames.

The **XLink-SX** stands out through its unique combination of a full-duplex S-Band transceiver for TM/TC tasks and a X-Band transmitter for high-speed data downlinks. This provides the functionality of two devices in a single compact transceiver.

FEATURES

- Fully featured and transparent bidirectional S- and X-Band transceiver (SDR)
- CCSDS compliant for physical and synchronisation layer
- Flight grade tested design
- Compact case and low power consumption
- Low-cost COTS design
- Short delivery time
- Additionally available: Extra flat patch antennas tuneable to customer specific frequencies

KEY SPECIFICATIONS

X-Band Tx operation	S-Band Rx operation	DC supply voltage
8.025-8.400 GHz	2.025-2.110 GHz	6 – 18 V / 28 V
S-Band Tx operation	**Data rate Ground2Sat**	**Low power consumption**
2.200-2.290 GHz	3.5 kbps … 896 kbps	max. 11 W (Tx + Rx), 4 W (Rx S-Band)
Data rate Sat2Ground	**Automatic Doppler shift compensation in Rx**	**Low mass**
2kbps … 200 Mbps	up to 200 kHz	200 grams
Linear RF output power	**Operational mode**	**Ultra-small volume**
up to +27 dBm (X-Band) up to +30 dBm (S-Band)	FDD, Full-duplex, Half-Duplex	< 0.2U
		TRL 9

	Default Configuration	Optional Configuration
Tx Frequency Band	8.025-8.400 GHz 2.200-2.290 GHz	7.900-8.500 GHz
Data Rate (Tx Payload Data)	500 kbps … 100 Mbps	2 kbps … 200 Mbps
Tx RF Bandwidth	Depending on the symbol rate	Maximum 56 MSymbols/s
RF Output Power	up to +27 dBm (X-Band) up to +30 dBm (S-Band)	Higher output power on request
Tx Modulation Schemes	BPSK, QPSK, OQPSK	GMSK, 8PSK, 16APSK
FEC Schemes	Convolutional code k = 7	Reed-Solomon
Rx Frequency Band	2.025-2.110 GHz	
Data Rate (Rx Payload Data)	56 kbps	3.5 kbps … 896 kbps
Doppler Shift Compensation	+/-200 kHz	
Rx Modulation Schemes	BPSK with BCH coding	Convolutional (CCSDS 131.0-B)
RF Connector Type	SMP, 50 Ω	
Data Interfaces	IEEE 802.3 1000BASE-T	SPI via RS422, UART via RS422
Connector Type	3 x Nano-D-Sub (Power, Ethernet, I/O)	
Applicable CCSDS Standards	CCSDS 231.0-B, 132.0-B, 131.0-B, 401.0-B	DVB-S2 via CCSDS 131.3-B
DC Supply	6 – 18 V	28 V – other on request
DC Power Consumption	<11 W 1x Tx + 1x Rx, <4 W Rx S-Band	
Mechanical Dimensions	90 x 65 x 25.3 mm³	Higher Radiation Tolerance: 96 x 71 x 32 mm³
Mass	200 grams (incl. housing)	Higher Radiation Tolerance: 365 grams (incl. housing)
Temperature Range	-20 … +60 °C (operating) -40 … +80 °C (non-operating)	
Case	Passivated aluminum	

Optional equipment

- Tx/Rx X- and S-Band patch antennas for satellite transceiver applications
- Customer-specific designs and turn-key solutions

Product specification may be subject to change without notification.

Made in Germany