

# XLink-S TM/TC

## S Band Transceiver with SDR for Small Satellites → Physical Layer according to CCSDS

### Highlights

- **Optimized for TM/TC applications**
- **Micro, nano or pico satellite usage**
- **Bidirectional communication links**
- **Downlink/Telemetry up to 2 Mbps**
- **Uplink/Telecommand 112 kbps**



**XLink-S TM/TC** is an advanced transceiver system (Software Defined Radio – SDR) for S band communication links of small satellites in LEO environment. The mechanical dimensions fit a 1U CubeSat as well as larger satellites. The radio interface and radio protocol were developed according to standard CCSDS protocols.

Data rate and Interfaces are optimized for Telemetry and Telecommand applications. Supported modulation schemes include BPSK, QPSK and OQPSK with appropriate FEC encoding schemes.

The satellite receiver (uplink) used for telecommand purposes of the satellites is designed for a standard CCSDS BPSK with BCH coding and net data rates of at 112 kbps. Two separate usable S band uplink receivers are available e.g., for redundancy purpose.

Data interface is based on CCSDS transfer frames.

A special feature of the **XLink-S TM/TC** transceiver is the integrated GPIO pin for receive ready. It can be used to let other connected satellite systems know the reception of data from ground.

XLink-S TM/TC includes 2 Tx and 2 Rx ports for redundancy and high link availability. It can be handled either via ethernet (IP) or RS422 (SPI). Additionally, we provide engineering support by phone or e-mail to integrate this transceiver successfully into your satellite.

### Features

- Fully featured and transparent bidirectional S band transceiver (SDR)
- Each 2 Tx and 2 Rx channels available for redundancy (only 1 operable Rx channel)
- CCSDS compliant for physical and synchronisation layer
- 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

- S band Tx operation: 2.200-2.290 GHz
- S band Rx operation: 2.025-2.110 GHz
- Operational mode: FDD/Full duplex/  
Half duplex
- Symbol rate Sat2Ground: 2048 kSymb/s
- Symbol rate Ground2Sat: 128 kSymb/s
- Linear RF output power: up to +29 dBm
- Automatic Doppler shift compensation in Rx: up to 200 kHz
- Low power consumption max 15 W (Tx + Rx)  
<4 W (1 Rx channel)
- DC supply voltage: 6 – 18 V
- Ultra-small volume: < 0.2U
- Low mass: 200 grams

	Default Configuration
<b>Tx Frequency Band</b>	2.200-2.290 GHz
<b>Symbol rate (downlink)</b>	2048 kSymb/s
<b>Tx RF Bandwidth</b>	2500 kHz
<b>RF Power Output (w/o aerial)</b>	up to +29 dBm per Tx channel
<b>Tx Modulation Scheme</b>	BPSK, QPSK, OQPSK
<b>FEC scheme</b>	Convolutional code $k = 7, r = 1/2$
<b>RF Connector Type</b>	SMP, 50 $\Omega$
<b>Rx Frequency Bands</b>	2.025-2.110 GHz
<b>Symbol rate (uplink)</b>	128 kSymb/s
<b>Doppler shift compensation</b>	+/-200 kHz
<b>Rx Modulation Scheme</b>	BPSK with BCH coding
<b>RF Connector Type</b>	SMP, 50 $\Omega$
<b>Data Interfaces</b>	SPI via RS422 (Standard) IEEE 802.3 1000BASE-T
<b>Connector Type</b>	3 x Nano-D-Sub (Power, Ethernet, I/O)
<b>Applicable CCSDS Standards</b>	CCSDS 231.0-B, 132.0-B, 131.0-B, 401.0-B
<b>DC supply</b>	6 – 18 V
<b>DC Power Consumption</b>	<15 W Tx + Rx, <4 W Rx only
<b>Mechanical Dimensions</b>	90 x 65 x 25.3 mm <sup>3</sup>
<b>Mass</b>	200 grams (incl. housing)
<b>Antenna Configuration</b>	Separate Tx & Rx antenna
<b>Temperature Range</b>	-20°C ... +60°C
<b>Case</b>	Passivated aluminum

### Optional equipment

- Tx/Rx S band patch antennas for satellite transceiver applications

Product specification may be subject to change without notification.