IQ wireless GmbH
Entwicklungsgesellschaft für Systeme und
Technologien der Telekommunikation

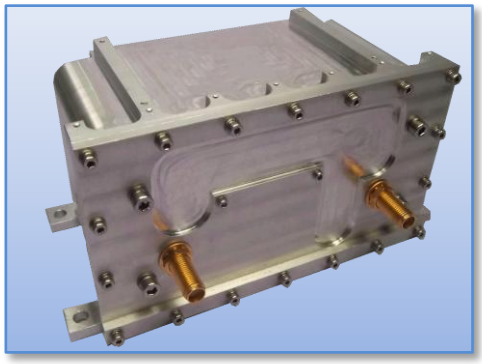
S Band Transceiver for Small Satellites

SLink
S-Band Inter-Satellite Link for Distributed Nanosatellite Networks

Rev.12/2013

Applications

- High speed data links from/to LEO
- Micro, nano or pico satellite usage
- Configurability for various modes: Sat2Ground, Ground2Sat and Sat2Sat bidirectional communication links



Slink Transceiver with Housing

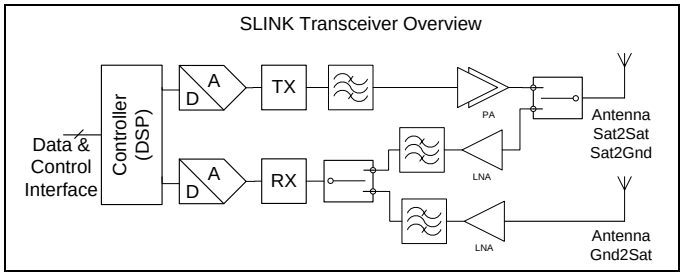
The **SLink** transceiver system provides a huge payload data downlink for micro, nano or pico satellite applications and the benefit of an integrated data uplink. Further, a bidirectional communication link between satellites can be established. It is designed as highly integrated S Band transceiver system with outstanding technical performance and versatile configuration options. The lifetime goal is for at least two years of operation in Low Earth Orbit (LEO) environment. All software program codes are stored redundantly to ensure a high reliability. The radio system can be adjusted in a frequency band between 2,200 and 2,290 MHz for downlink (Sat2Ground) and inter satellite communication links (Sat2Sat) and between 2,025 and 2,110 MHz for uplink communication links (Ground2Sat), e.g. for telecommand purposes.
SLink operates at physical and data link layer in an Open Systems Interconnection model (OSI). It is fully transparent to higher layer protocols, e.g. CCSDS - Proximity-1 Space Protocol. A correspondent transceiver equipment is available for integration into existing ground station equipment via RF interface. The payload and TM/TC data are transparently provided as UDP data via Ethernet 100/10BaseT interface.

Features

- Fully featured S band transceiver
- Flight grade tested design
- Compact case and low power consumption
- Versatile configuration options
- Low cost COTS design
- Short delivery time (typically 6 months)

Key Specifications

- S band operation: 2,025-2,300 MHz
- Data rate Sat2Ground: 0.6 – 4.0 Mbps
- Data rate Ground2Sat: 30 – 200 kbps
- Data rate Sat2Sat: 27 – 150 kbps
- Operational mode: TDD / semi-duplex
- Modulation schemes (configurable): BPSK/QPSK/8PSK/QAM16
- FEC: convolutional code, r=0.5 / 0.75
- Linear RF output power: up to +27 dBm (adjustable)
- Low power consumption: 3 - 4,5 W receive
  8 - 12 W transmit
- DC supply voltage: 7 – 18 V
- Ultra small volume: 65 x 65 x 137 mm^3 (w/o connectors)
- Low mass: approximately 420 gram
- Data and control interface: SPI / RS422



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	Sat2Ground	Ground2Sat	Sat2Sat
Frequency Range	2,200-2,290 MHz	2,025-2,110 MHz	2,200-2,290 MHz
Frequency stability	±3ppm (w/o crystal aging)		
RF bandwidth	1.75 MHz	100 kHz	100 kHz
RF output power (nominal)	-2...+27 dBm	up to +27 dBm (w/o additional PA)	-2...+27 dBm
Data Rate	0.6 – 4 Mbps	30 – 200 kbps	27 – 150 kbps
Operational mode	Time Division Duplex (TDD) / semi-duplex		
Modulation scheme	BPSK / QPSK / 8PSK / QAM16		
FEC scheme	Convolutional encoding / Viterbi decoding (rate = 0.5 / 0.75)		
Power supply	7 ... 18 V DC		
Power consumption	8 ... 12 W transmit mode 3 ... 4,5 W receive mode		
Temperature range	-20 ... +50 °C operating -30 ... +60 °C switch-on -40 ... +65 °C non-operating		
Dimensions	65 x 65 x 137 mm^3 (w/o connectors)		
Mass	About 420 g (including housing)		
Radiation tolerance	>10 kRad (Si) (with housing as shielding)		
Random Vibration	25 G_{rms} in all axis		
Data interface to satellite controller	SPI (RS-422) for payload data RS-485 for control data (TM/TC)		
Connector type	Mini-DSUB 15		
RF connector	50 Ohm, SMA (f) (at satellite) 50 Ohm, N (f) (at SLINK ground station transceiver equipment)		
Data interface at ground station	Ethernet 100/10BaseT (via appropriate SLINK ground station transceiver equipment, see options below)		

Slink Product Specification

Optional available Equipment

- SLINK ground station equipment (19” rack, 2HU transceiver with data interface)
- S band feeds for parabolic ground station antennas (including antenna patch, LNA and RF band pass filter)
- Tx / Rx S band patch antennas for satellite transceiver applications (e.g. RHCP, 70 x 70 mm^2, gain about 6dBi)
- Tx / Rx antenna switches for satellite transceiver applications
- Customer specific designs and turn-key solutions

Product specification may be subject to change without notification