XLINK-L

L-Band Transceiver with SDR for Small Satellites ⇢ Go.BIC Service (via Viasat's L-Band GEO satellite network) ⇢ CCSDS TM/TC and Payload Data Transfer

HIGHLIGHTS

- Flexible data links by powerful **SDR** platform
- Configurable data rates starting at a few kbps
- Fast link acquisition and allocation
- Application for high link budget requirements
- CubeSat and Small Satellite usage
- Bidirectional communication links

XLink-L is an advanced transceiver system (Software Defined Radio – SDR) for L-Band communication links of small satellites in LEO environment. The mechanical dimensions are compatible with both CubeSats and larger satellites. The radio interfaces and radio protocol were developed for physical and synchronization/coding layers could be configured for various applications:

- TM/TC data transfer based on Go.BIC service for instant tasking via Viasat's L-Band GEO satellite network
- Data transfer of payload as well as TM/TC data according to standard CCSDS protocols

Typical full-duplex data transfer capabilities for these services include net rates of up to 128 kbps in downlink (sat2ground) as well as in uplink (ground2sat) in 200kHz wide RF channels. Even higher rates are possible depending on available RF bandwidths. Supported schemes include BPSK and (O)QPSK types of modulation with appropriate FEC data coding.

Instant tasking with the Go.BIC service is initiated by ground station request and enables world-wide access via Viasat's L-Band GEO satellite network. Channel access procedure operates fully autonomously in real-time with a proprietary and adaptive modulation/coding scheme (AMC) to maximize data throughput.

Lowest symbol rates for all radio protocols are 4kSymbols/s. The satellite receiver performs all procedures and steps for link establishing automatically.

A special feature of the XLink-L transceiver is the optional application of two separate Tx and Rx channels. They can be used for redundancy purposes. Furthermore, the two Tx channels could be combined for an increase of transmit power.

FEATURES

- Fully featured and transparent bidirectional L-Band transceiver (SDR)
- Configurable radio protocols
- Flexible data rate settings down to few kbps
- Flight grade tested design
- Compact case and low power consumption
- Low-cost COTS design
- Short delivery time

KEY SPECIFICATIONS

L-Band Tx operation
1.6265–1.675 GHz

Data rate Tx
2 kbps ... 128 kbps

Linear RF output power
2 x up to +30 dBm

Operational mode
FDD, Full duplex, Half Duplex

L-Band Rx operation
1.518-1.559 GHz

Data rate Rx
2 kbps ... 128 kbps

Automatic Doppler shift compensation in Rx
up to +/-50 kHz

TRL 9

DC supply voltage
6 – 18 V / 28 V

Low power consumption
max 15 W (Tx + Rx)
3 W (1 Rx channel)

Low mass
200 grams

Ultra-small volume
< 0.2U

Made in Germany

IQ Technologies for Earth and Space GmbH
Ernst-Lau-Straße 5, 12489 Berlin, Germany
ISO 9001:2015 ● info@iq-spacecom.com ● www.iq-spacecom.com

	Default Configuration	Optional Configuration
Tx Frequency Band	1.6265–1.675 GHz	on request
Symbol rate (Tx Data)	4 kSymbols/s ... 128 kSymbols/s	> 128 kSymbols/s
Tx RF Bandwidth	Depending on the symbol rate	
RF Power Output	2 Tx channels up to +30 dBm each	combined up to +33 dBm
Tx Modulation Scheme	BPSK, QPSK, OQPSK	GMSK
FEC scheme	Convolutional code k = 7 with r = 1/2, 2/3, 3/4, 5/6, 7/8	Reed-Solomon
Rx Frequency Bands	1.518-1.559 GHz	on request
Symbol rate (Rx Data)	4 kSymbols/s ... 128 kSymbols/s	> 128 kSymbols/s
Doppler shift compensation	+/-50 kHz	specific settings
Rx Modulation Scheme	BPSK with convolutional code k=7, r=0.5 (Go.BIC)	BPSK with BCH decoding (CCSDS)
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 Standards	CCSDS 231.0-B, 132.0-B, 131.0-B, 401.0-B	on request
DC supply	6 – 18 V	28 V – other on request
DC Power Consumption	<15 W Tx + Rx, <4 W Rx	
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	Specific rad-hard housing

Optional equipment

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

Product specification may be subject to change without notification.

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