

## CXS-1000

# MULTI-FUNCTION SOFTWARE DEFINED TRANSPONDER

### Telemetry, Tracking & Command (TT&C)

L3Harris brings its strong TT&C expertise in offering the CXS-1000, a true software defined transponder featuring multi-band and multi-waveform capabilities in a compact footprint designed for today's low-cost and shorter duration small satellite applications.

#### SUMMARY

The multi-waveform receiver provides flexibility in demodulation, decoding and channel selection. The baseline receiver is currently available in L-/S- band with X-/Ka-band functionality optional.

The complementary S-band transmitter delivers a scalable output power of 1W to 5W, with data rate capability up to 20 Mbps. The commandable RF output is also fully protected from high VSWR loads, as well as short and open conditions.

Fully synthesized channel selection is offered via factory fixed or external user control. Standard off-the-shelf waveforms are available, or custom waveforms can be used to suit user needs.

Digital and analog data interfaces are provided via a serial control and status interface. The unit can be provided as a single integrated unit or as separate transmitters and receivers for full duplex multi-role and multi-band missions.

The CXS-1000 offers breakthroughs in price and performance, from a trusted long-term TT&C supplier. Engineering analyses and manufacturing/ quality processes are consistent with industry's high reliability standards.

Currently in production, the CXS-1000 provides a high performance solution with standard pricing and delivery for evolving lower cost satellites and constellations.



## FEATURES

- > Radiation tested for GEO Environments
- > Downlink up to 20 Mbps
- > Multi-Waveform; BPSK, QPSK, SOQPSK, SGLS AM/FSK, digital ranging, and user defined
- > Multi-band operation available
- > Output power 10 mW to 5 W L-/S-band (optional 20 W available)
- > Small form factor, scales with desired functions
- > High-reliability design analyses
- > Qualified for typical launch environments
- > Available RF assemblies with mission defined filters and antenna switches/couplers
- > Housing options consistent with radiation environment
- > Optional: vertical or horizontal mounting configurations

## SPECIFICATIONS

### Receiver

Center Frequency	1.7 GHz - 2.1 GHz, L/S-band
Data Rate	250 bps to 1 Mbps
Modulation	BPSK, QPSK, SGLS, USB, TDRSS, User Defined
Tracking Rate/ Range	10 kHz/sec, +/-100 kHz
Input RF Signal	-30 dBm to -120 dBm
Noise Figure	2.5 dB
Input VSWR	2.0:1
DC Power	6 W

### Transmitter

Center Frequency	2.2 GHz - 2.3 GHz
Frequency Stability	+/- 10 ppm over life
Phase Noise	≤2.5 deg. RMS, 100 Hz to 10 MHz
EVM	3% RMS
Data Rate	< 20 Mbps, variable
Modulation	PCM/FM, BPSK, QPSK, SOQPSK, OQPSK, UQPSK, User Define
Forward Error Correction (FEC)	Rate 1/2 Convolutional Encoding, Rate 7/8 Reed Solomon
RF Output Power	10 mW to 5 W (commandable)
DC Power	25 W (2 W output power), 30 W (5 W output power)
VSWR	1.5:1
Spectral Mask	per NTIA

### Transponder

Outline Dimension	4.0" x 4.5" x 4.0" (core configuration)
Mass	2.5 - 3.5 lbs. (depending on configuration and housing)
Mission Life	6 months - 5 years
Duty Cycle	TX: 15%, RX: 100% (typical)
Radiation	50 KRad (chassis) 5 Krad (parts level)
Bus Voltage	+28 V +/- 6 V (ISO), 10.5 - 12.3 V, other Bus Voltages available
EMC/EMI	MIL-STD-461F (Tailored)
Data Clock Interface	Differential, RS-422, Single-ended also supported
Control/Status Interface	RS-22

### Options

X-Band/ Ka-band Transmit/Receive
20 W S-Band PA
AES-256 Encryption/ Decryption (FIPS-140)

## CXS-1000, Multi-Function Software Defined Transponder

© 2019 L3Harris Technologies, Inc. | 07/2019

This presentation consists of L3Harris Technologies general capabilities information that does not contain controlled technical data as defined within the International Traffic in Arms (ITAR) Part 120.10 or Export Administration Regulations (EAR) Part 734.7-11 Data, including specifications, contained within this document are summary in nature and subject to change at any time without notice at L3Harris' discretion. Call for latest revision. All brand names and product names referenced are trademarks, registered trademarks, or trade names of their respective holders.

ML642 Rev D



**L3HARRIS™**  
FAST. FORWARD.

1025 W. NASA Boulevard  
Melbourne, FL 32919  
t 858 694 7500  
Sales.TRF@L3Harris.com