

CRKu-900 Ku-Band Commercial TC&R/TT&C Command Receiver



The CRKu-900 is L-3 Telemetry West's (L-3 TW) newest addition to the commercial Telemetry, Command and Ranging (TC&R)/Telemetry, Tracking and Control (TT&C) marketplace, and paves the way for a lower cost approach, faster delivery times, increased performance and greater flexibility.

With a blend of digital signal processing and L-3 TW's proprietary RF ASIC design, this receiver offers the flexibility of high-resolution, in-flight frequency synthesis and commandable data rates, while avoiding traditional fractional spurs and requiring only 8 W of primary power consumption.



This innovative technique allows for sub kHz (< 100 PPB) tuning over a 200 MHz window around the default factory set channel while maintaining spurious free performance. Tuning is provided by two (primary and redundant) RS-232 serial interfaces over a RS-485 physical interface. Single-bit commanding for dual-frequency programs is also available. This topology is centered upon a single 100 MHz TCXO, also used in the CTKu-900 transmitter, greatly reducing traditional long-lead crystal oscillator procurement problems.

The CRKu-900 is also extremely flexible with spacecraft bus designs. By standardizing on four RS-422 clock, data and bit lock outputs with four ranging channels, this product offers unparalleled flexibility for redundancy and cross strapping. Having just three connectors (RF, Power and Interface) combined with the vertical-mounting structure allows for high-density integration and simplified spacecraft wiring.

All these features were strategically designed to meet the fast-paced commercial satellite market, and reach a short delivery lead-time.

The CRKu-900 is a fully-qualified design and can be provided standalone or in conjunction with the CTKu-900, the corresponding Ku-Band commercial TC&R/TT&C transmitter.

FEATURES

- FM receiver for commercial TC&R/TT&C telemetry applications
- Frequency agile in flight (< 1 kHz resolution)
- Frequency tuning across 200 MHz band
- Commandable or factory set data rates
- High-reliability, radiation-hardened
- 22.5-year mission life



CRKu-900

Ku-Band Commercial TC&R/TT&C

Command Receiver



Specifications

Receiver/Demodulator

Receive frequency	12.75 to 14.5 GHz or 17.3 to 18.3 GHz
Carrier acquisition/tracking range	±400 kHz
Dynamic range	-60 to -112 dBm
Uplink freq. deviation	±400 kHz

Ranging Channel

Ranging bandwidth	0.3 to 100 kHz
Ranging delay variation	±25 ns
SNR	63 dB/Hz at -108 dBm

Command Channel

Modulation Type	BPSK/FM
Subcarrier frequency	16 kHz
Data rate	125, 250, 500, 1000, or 2000 bps
Threshold (10 ⁻¹⁰ BER)	-112 dBm (typical performance) at 250 bps or 1 kbps
Squelch	-115 dBm ±2 dBm

Output Interface

RS-422, quad redundant	
Outputs	Data, clock, bit-sync lock

Input Serial Interface

Data rate	500 kbps
Serial protocol	Similar to RS-232
Physical interface	RS-485, dual redundant (optional 120Ω termination)
Commandable 3-bit address	

Power Requirements

Voltage	+95 to +105 VDC
Power consumption	8 W typical

General

Size	8.5 in. L x 2.75 in. W x 6.73 in. H
Weight	4.6 lb.

Environmental

Temperature	-15 °C to + 60 °C (Acceptance)
Vibration	14.9 Grms
Altitude	Unlimited
EMI	MIL-STD-461C (tailored)
Radiation	100 krad (chassis)
Mission life	22.5 years

Standard Features

Factory set or commandable data rates and frequency	
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