

T400XR

Satellite TT&C Ranging Modem

The RT Logic 400XR (T400XR) is a **satellite telemetry, tracking, and commanding modem** for satellite ground stations. The system's flexible and modular architecture allows the T400XR to support multiple mission configurations and be used as a replacement for both legacy receiver models or for new applications. Reliability and configuration diversity make the T400XR perfectly suited for applications spanning the full lifetime of the satellite from assembly and test, through launch and in orbit test phases, to full operation.

Product Description

The T400XR is all about providing **flexibility** in form, fit, and function. Based on the latest FPGA technology, the T400XR combines the custom and **multi-mission** processing capabilities of software-based systems with the speed, low latency, and low latency variability of an analog system. The T400XR supports a wide range of modulation and demodulation signal processing modes, including: SGLS and USB (Tone) Ranging, PSK, PM, FM, and spread spectrum. Custom waveforms are also supported. Multi-channel systems support diversity combining or multiple simultaneous downlinks and uplinks.

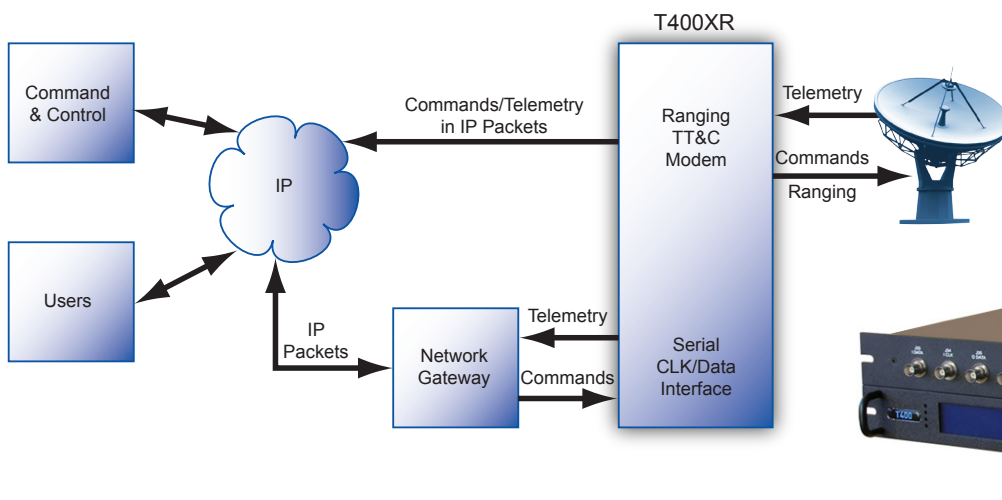
The T400XR leverages RT Logic's proven signal processing hardware, firmware, and software expertise, coupled with a Commercial-Off-The-Shelf (COTS) Linux-based general purpose processing platform. Information Assurance (IA) hardening is an available factory option to meet security requirements, and dual-redundant power supplies bring the benefit of increased reliability. Net-centric features—including control from any networked device, anywhere in the world—enable 24/7 *lights-out* operation, reducing lifecycle cost

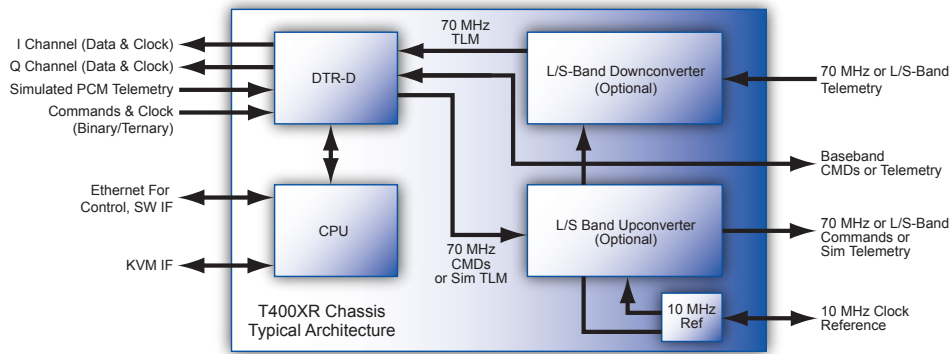
From factory test to launch to on-orbit operation, the T400XR provides the lowest cost, lowest risk solution for your satellite TT&C modem needs.



Widely Trusted

- ✓ Satellite manufacturers and operators
- ✓ Civil, commercial, and military
- ✓ Key features
- ✓ Linux-based open architecture
- ✓ Flexible and customizable
- ✓ Extensive ranging format support
- ✓ Net-centric/web-enabled
- ✓ Proven benefits
- ✓ Assured mission success
- ✓ Low cost and low risk
- ✓ Short lead times
- ✓ Extended lifecycle support





Key Specifications

Intermediate Frequency Processing

- IF input frequency: 50 MHz to 90 MHz
- Tuning resolution: < 0.1 Hz
- IF input power level: < -60 dBm to +10 dBm
- Acquisition range: 1 MHz
- Maximum Doppler range: < 10 kHz/sec

Modulation

- Direct PSK (BPSK/QPSK/OQPSK/UAQPSK/SOQPSK)
- Two Subcarriers: SGLS/USB
- PM, FM, FSK/AM
- Convolutional, Reed-Solomon encoding, TPC
- Subcarrier frequency: 1 kHz to 20 MHz
- Analog input: FM/PM/AM
- Spread spectrum: TDRSS format, others

Demodulation

- Direct PSK (BPSK/QPSK/OQPSK/UAQPSK/SOQPSK)
- Symbol rates: up to 30 Msps
- Subcarrier BPSK/QPSK
- Viterbi, Reed-Solomon, TPC decoding
- Subcarrier frequency: 1 kHz to 20 MHz
- Bit synchronization, decoding (PCM code processing, I/Q re-interleaving, de-randomization)
- Spread spectrum: TDRSS format, others

Command Generator/Modulator

SGLS/USB commanding, echo check

Output frequency: 50 MHz to 90 MHz

IF output level: -40 dBm to -3 dBm

Subcarrier BPSK (USB)

Ranging

- SGLS PRN ranging
- USB tone ranging
- TDRSS ranging

Frequency Reference

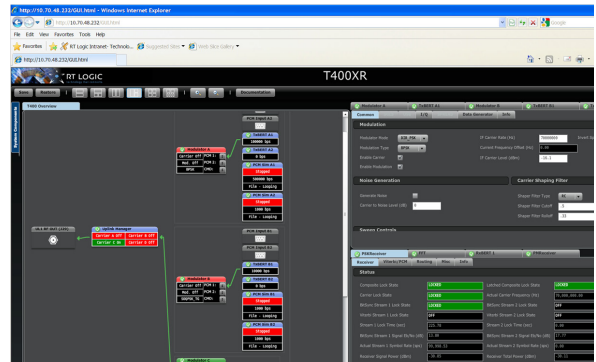
- External 10 MHz or internally generated

Monitoring and Control

- Front-panel keypad & LED status indicators
- Front-panel test points (optional)
- Local monitor (optional)
- Ethernet TCP/IP remote M&C interface
- Web-based GUI and client objects

I/O

- L/S-band input/output
- 70 MHz I/F input/output
- Baseband analog input/output



- I/Q channel data & clock output
- Ternary/binary command data & clock input
- Simulated telemetry data & clock input
- SLE, ethernet data packets

Environmental

- 0 °C to 50 °C operating, -10 °C to 60 °C storage
- 10% to 90% relative humidity

Mechanical and Power

- 1U, 2U, 4U, and 5U 19" rack-mount unit
- 120/240V, 47 Hz to 63 Hz, 3.5 A max