

T500MX

Mux/DeMux Network Edge Device

KRATOS | RT LOGIC



Overview

The Kratos RT Logic T500 Internet Protocol (IP) Time-Data Correlation (TDC) Multiplexer/Demultiplexer Protocol Translator (T500MX) deterministically transports serial telemetry, digitized analog signals, and associated IRIG time between locations linked by commercial IP-based networks, while maintaining very low latency, rigid TDC, and signal integrity. The T500MX supports aggregate data rates up to 1 Gbps, leveraging the inherent switching power of IP networks to provide reliable and robust data delivery from the source to multiple destinations.

Application

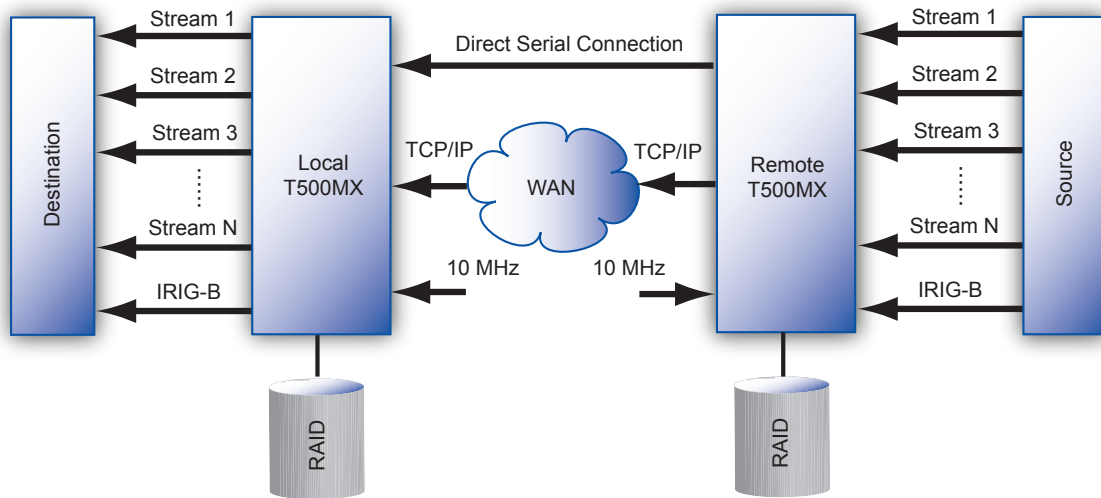
Telemetry collection and processing centers, control centers, ground stations, test sites and ranges, and payload operations facilities are migrating from expensive dedicated serial interconnections to commercially available IP networks. Multiple telemetry streams often need to be transmitted from one point to another over large distances, while maintaining their time-data relationship. The T500MX encapsulates the network, making it transparent to the real-time delivery of time correlated signals. The T500MX translates between custom serial signaling used by legacy and modern telemetry equipment, and the standards-based IP network protocol. Conversion back to the original serial, digital, or analog data stream at the destination with high-fidelity allows the T500MX to be a drop-in replacement for existing serial transport mechanisms. The T500MX offers options to support Consultative Committee for Space Data Systems Space Link Extensions (CCSDS SLE), Air Force Satellite Control Network (AFSCN) Interoperability protocols, and Test and Training Enabling Architecture (TENA).

Serial telemetry and IRIG signals are transported via IP protocol between a source (local or remote) T500MX, and one or more destination (local or remote) T500MX units. Variable network latency is factored out by dynamic rate buffering and a deterministic timing scheme that utilizes an adaptive high-rate clock to control stream-to-stream skew. The timing approach factors source input jitter out of the destination streams and produces accurate serial output at each destination.

The T500MX efficiently performs conversion to and from IP packets, relying on Field-Programmable Gate Array (FPGA) technology running software-defined algorithms to provide speed and configurability. Telemetry software is included allowing dynamic and/or static configuration and monitoring of the distribution network.

Key Features

- Settable, Deterministic Latency
- Very Low Latency Contribution
- One-to-Many Reliable Data Distribution
- Transports IRIG Along with Telemetry
- Very Low Stream-to-Stream Skew
- Rate Buffering, Network Latency Resolution
- Encrypted and Open Data
- Supports Configuration and Control
- On-the-Fly for Each Stream
- Factors Out Source Jitter
- IP Over Ethernet and ATM
- Control and Status Via Standard Web Browsers
- Many Signal Processing Options
- Clock Recovery, BER, Reed-Solomon, CRC
- Automatic WAN Fault Detection and Recovery
- Optional Data Recording and Playback
- RAID0, 1, 5, 10
- Up to 2 TB Internal Storage
- iSCSI, Fibre Channel External Multi-Terabyte Storage Options



Modular, Digital Design

The T500MX is a server-class Personal Computer (PC) running a real-time Linux operating system with hot-swappable disk drives, dual hot-swappable power supplies, Intel Xeon Central Processing Unit (CPU), multiple Gigabit Ethernet ports, and RT Logic analog/digital processor cards. It is available in 1U, 2U, 4U, or 5U configurations, and mounts in a standard 19-inch rack. Multiple Input/Output (I/O) options are available including TTL, RS-422, ECL, LVPECL, and LVDS signal lines to support a wide variety of signal interfaces and data rates. Numbers and types of I/O ports can be selected to provide a cost-efficient transport solution. The modular design of the T500MX and the Telemetry software architecture permit easy tailoring of a standard T500MX configuration to meet customer specific requirements. The system is compatible with most third-party systems, as well as all of Kratos RT Logic's other offerings, such as the T70/70XL, T400XR, T720HDR, and T1200HDR modems.

Standard Configurations

All Configurations Support Redundant Array of Independent Disks (RAID) Disk Systems:

- T500MX-LR: Low-Rate (Up To 35 Mbps Per Channel, 480 Mbps Aggregate), RS-422 Or TTL, 8 Channels (8 Simplex Or 4 Full Duplex) with IRIG Capture/Regeneration. Options Include Additional Channels In 8-Channel Increments, Archiving, and Playback.
- T500MX-HR: High-Rate (35 Mbps To 520 Mbps Per Channel, 1+Gbps System Aggregate), LVPECL Or ECL, 2 To 4 Channels with IRIG Capture/Regeneration. Options Include Additional Channels In 1-Channel Increments, Archiving, and Playback.