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RT LOGIC
A KRATOS Company

HIGH-RATE DATA PROCESSOR (T500HR)

Overview

The RT Logic 500 High-Rate Data Processor (T500HR) ingests and processes multiple, concurrent, real-time TDM and CCSDS data streams. As a digital stream processor, the T500HR offers unmatched performance and hardware flexibility, supporting simultaneous processing, recording, and data distribution up to the specified maximum aggregate data rate of 1.6 Gbps. T500HR supported functions include frame synchronization, derandomization, Reed-Solomon forward error correction, CRC error detection, rate buffering, data filtering/sorting, IRIG time-tagging, and network data distribution. Additional T500HR options include archive, playback, Pragmatic General Multicast Protocol (PGM), CCSDS Space Link Extension (SLE), multi-channel Best Frame Select, and network file management.

Applications

Demand for wideband satellite payload data, such as Remote Sensing imagery, is rapidly increasing. Earth Observation and other wideband data processing ground stations require modular and flexible COTS solutions to support payload processing for multiple missions. Each mission typically has requirements for high performance, real-time data acquisition, high availability, reliable data transport, IP-based network data distribution, and custom data processing and FEC algorithms.

The T500HR provides a modular, tailorable, best-in-class digital processing solution for high-rate TDM/CCSDS data, offering highly flexible choices for the data source and destination ports. With discrete signal support for ECL, LVPECL, LVDS, RS-422, TTL input/ output signals, as well as direct ingest and distribution over a network interface, the T500HR readily integrates with any receiver or other IP-connected ground equipment. Software-defined algorithms enable a single T500HR to support multiple concurrent data streams per mission or to be quickly reconfigured to support alternate missions. The T500HR optional Best Frame Select capability creates the highest quality data stream based on QOS statistics for data frames from multiple identical source streams.

The T500HR leverages the inherent switching power of high-speed IP networks for data distribution. Options include point-to-point TCP/IP, multicast UDP/IP, and Pragmatic General Multicast Protocol (PGM). PGM provides reliable and bandwidth-efficient delivery of processed/filtered CCSDS frame/packet data to multiple users on a LAN or WAN. If the WAN itself is a bottleneck, the T500HR supports rate buffering to maximize throughput.

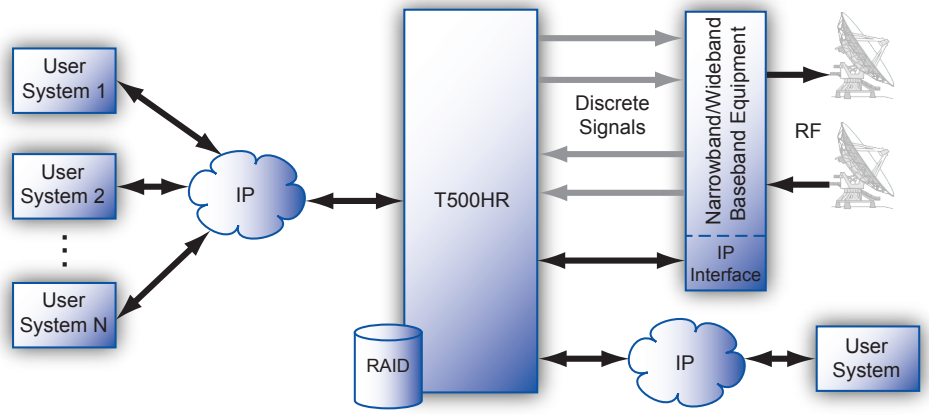


Key Features

- ✓ Data Processing Rates To 1.6 Gbps (Aggregate Per System), With Support For Multiple Data Streams Per System
- ✓ Multi-Mission Support
- ✓ VCDU, EVCDU, APID Filtering/Sorting
- ✓ Real-Time Quality Of Service Statistics
- ✓ Integrated IRIG In/Out Support For Timestamping Or IRIG Regeneration
- ✓ CCSDS Derandomization
- ✓ Flexible Data Distribution
- ✓ One-To-Many Reliable, Efficient Network Data Distribution Using PGM
- ✓ CCSDS SLE Data Distribution
- ✓ Rate Buffering, Network Latency Resolution
- ✓ Programmable TDM/CCSDS Frame Sync
- ✓ Encoded TDM/CCSDS Telemetry Simulation, With Unlimited Stream Playback Capability
- ✓ Software/Firmware-Defined FEC
- ✓ Reed-Solomon
- ✓ CRC Check, BER, LDPC
- ✓ Server Class Platform With Plug-And-Play Support For OEM Peripherals
- ✓ IPV4 And IPV6 Support
- ✓ Multiple API Options Including Web Browser Interface
- ✓ Hot-Swappable Power Supplies, Disks For High Reliability And Availability

SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE.

T500HR Difference



Modular, Digital Design

The T500HR is a high-performance, real-time, high-rate digital processing system with dynamically reconfigurable algorithms. The T500HR has a full range of firmware and software personality options for processing high-rate CCSDS/TDM telemetry, multiplexing/demultiplexing, Time-Data Correlation (TDC), IRIG timestamping/generation, PCM simulation, derandomization, error detection and correction (BER, Reed-Solomon, LDPC, CRC), archive, digital/analog recording, playback, and custom functions.

The T500HR is a highly available server-class PC running a real-time Linux OS with hot-swappable disk drives, dual hot-swappable power supplies, Intel CPU(s), quad Gb Ethernet ports, RT Logic digital processor cards, and ready support for today's computer peripherals (DVD, additional NICs, 10-Gigabit Ethernet, RAID, tape drives, iSCSI, etc.). The base T500HR platform is a 2RU form-factor; optional 1U, 4U, and 5U configurations are available when appropriate. Multiple I/O options are available, including TTL, RS-422, D-ECL, LVPECL, and LVDS signal lines, as well as direct network ingest and distribution. Software/firmware-defined algorithms provide easy tailoring of a standard T500HR configuration to meet customer-specific requirements.

Reed-Solomon decoding is performed entirely by firmware, eliminating the need for the EOL NASA Reed-Solomon chip utilized by competitor products. The system is compatible with other RT Logic products, such as the Telemetrix HDR modem, as well as third-party systems. The features and options of RT Logic's T500GT, T500MX, and T500RX are plug-in compatible with the T500HR.

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