T500SB
IP-to-IP Space Link Bridge

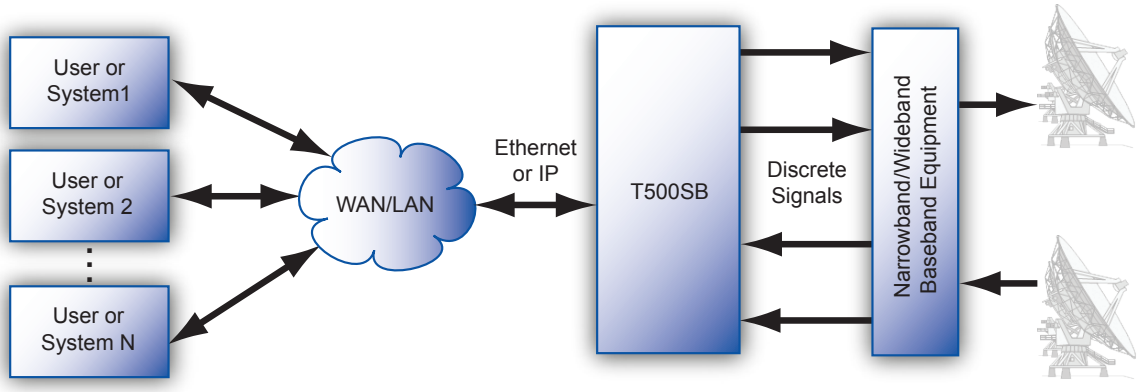
KRATOS | RT LOGIC

Overview
The Kratos RT Logic T500SB IP-to-IP bridge system provides a seamless bidirectional OSI Layer 2 Bridge or Layer 3 Routing interface between two terrestrial Ethernet (IEEE 802.3ab, 1000BASE-T) networks connected via satellite up/downlink or between a terrestrial Ethernet and an Ethernet network on a space vehicle. Demand for simplified interfaces between terrestrial and space systems, or between terrestrial systems connected via space links, is a growing industry trend. As newer space systems adopt TCP/IP over Ethernet for the forward/return links in lieu of complex, specialized serial interfaces, a more flexible ground station architecture is required.

Application
For the Layer 2 forward link, the T500SB accepts Ethernet packets into Gigabit Ethernet Interfaces, performs CCSDS Encapsulation, and generates AOS Frames for transmission to the forward link. As part of the CCSDS Encapsulation Service, Reed-Solomon Forward Error Correction (FEC) encoding is applied to the input data. For the Layer 2 return link, the T500SB provides frame synchronization, derandomization, Reed-Solomon FEC, and Ethernet data distribution via Gigabit Ethernet. Similar to the Layer 2 process, the Layer process supports standard routing protocols to provide ground to space routing using standard CCSDS Encapsulation and AOS Framing.

The T500SB is a modular, tailorable, one-box solution that provides a standards -based network interface to the terrestrial networks and high speed serial interface (ECL, LVDS, TTL, RS-422) to a COTS Receiver such as the Kratos RT Logic T400/T1200HDR or other third party commercial modem. Software-defined algorithms enable a single T500SB to support multiple missions.

Key Features
- Low Latency
- Support for multiple data streams per system
- Plug-and-Play compatibility with IEEE 802.3ab Based Network
- Programmable TDM/CCSDS frame synchronization
- VCDU, EVCDU, APID Filtering/Sorting
- Real-Time quality of service statistics
- Software/Firmware-defined forward error correction
- Reed-Solomon (255,233) and custom Reed-Solomon detection and correction
- Low-Density Parity Check (LDPC) using hard decision bits
- CRC check
- Obsolescence protection
- PCI express data processing cards
- Reed-Solomon in firmware
- Flexible data distribution
- CCSDS SLE or PGM data distribution
- Rate buffering, network latency resolution
- Server class platform with plug-and-play support for OEM peripherals
- CCSDS derandomization
- IPV4 and IPV6 support
- Hot-Swappable power supplies, disks for high reliability and availability
- Supports configuration changes without powering down (software-defined algorithms)
- BER



Modular Design

The T500SB is a high-performance, real-time, high-rate digital processing system with dynamically reconfigurable algorithms. The T500SB has a full range of firmware and software personality options for processing high-rate CCSDS/TDM telemetry, derandomization, error detection and correction (BER, Reed-Solomon, LDPC, CRC), OSI Layer 2 Bridge Functions, and OSI Layer 3 Routing Functions.

The T500SB is a highly available server-class PC running a COTS Enterprise Linux OS with hot-swappable disk drives, dual hot-swappable power supplies, Intel Xeon CPU, multiple 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.). It is available in 1U, 2U, 4U, or 5U configurations and mounts in a 19-inch rack. Multiple I/O options are available, including TTL, RS-422, D-ECL, LVPECL, and LVDS signal lines. Software/firmware-defined algorithms provide easy tailoring of a standard T500SB configuration to meet customer-specific requirements.