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RT LOGIC
A KRATOS Company

# FRONT-END PROCESSOR (T501)

## Overview

The RT Logic 501 (T501) family of products offer innovative solutions for front-end data processing functions within satellite control centers. Key T501 features include intelligent front-end telemetry processing, formatting, verification of vehicle commands, and control of external devices such as cryptographic equipment. Data is time correlated using high-precision IRIG signals. The T501 product line Application Programming Interface (API) includes a convenient Transmission Control Protocol/Internet Protocol (TCP/IP)-based interface, easily integrated into any Telemetry, Tracking, and Control (TT&C) system. A fully-featured web-based interface is also supported.

The T501 product family offers three extensible configurations. The T501-SC integrates high performance Digital Front-End Processors (DFPs) to offer a low-cost solution for one to two contacts in a single 1U chassis. The T501-XC incorporates an external 3U chassis with hot-swappable components for multi-contact, high-availability systems. The T501-VM is a software-only version of the versatile T501 line which allows for communication with newer generation network-based cryptographic equipment. The T501-VM can be loaded onto customer TT&C server platforms for a more streamlined, lower-cost front-end architecture.

## Features

- Telemetry Processing (Up To 12 Streams)
- Data Format/Polarity Conversion
- Decoding (Viterbi, Reed-Solomon)
- Programmable Frame Synchronization
- CCSDS Transfer Frame/Packet-Level Processing
- IRIG Or NTP-Based Time-Tagging
- PCM Telemetry Simulation
- Data Recording/Playback
- Bit Synchronization
- Command Processing (Up To Six Streams)
- Data Format Conversion (Ternary, Binary, Dibit, Packets)
- Time-Critical Commanding
- Fill Command Generation
- CCSDS Telecommand Formatting With COP-1
- Command Echo Verification
- Cryptographic Control/Status (Elwell, MYK, KI-17, KS-252, And Others)
- API and Web-Browser For Monitor And Control

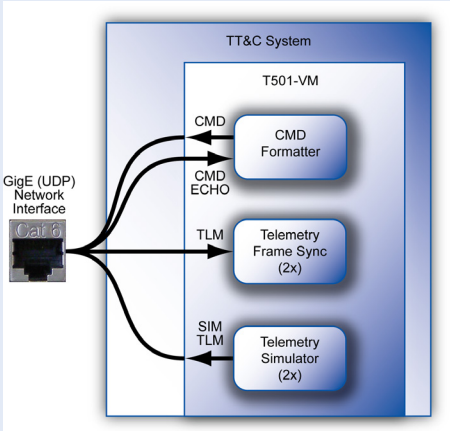
### T501-SC



### T501-XC



### T501-VM




SPECIFICATIONS AND FEATURES SUBJECT TO CHANGE.

## Application

Telemetry processing functions include format conversion, frame synchronization, and time-tagging. The T501 can be configured to support Time Division Multiplexing (TDM) or Consultative Committee for Space Data Systems (CCSDS) processing, including Reed-Solomon decoding and VCDU/packet processing, bit synchronization, and data recording/playback. Command processing functions include conversion to an uplink encryptor's ternary or binary formats, fill command generation, time release, block commanding, and command echo checking. The T501 can also be used to generate simulated telemetry streams for loopback testing. The T501 provides a common, consistent network-based resource for monitoring and control of encryption/decryption equipment.

## Flexible Architecture Options

The T501-SC makes extensive use of RT Logic's FPGA-based DFP technology to implement high-performance telemetry and command processing functions, PCM simulators, IRIG time decoders, Reed-Solomon encoding/decoding, and discrete signal I/O.

The T501-XC extends this capability by integrating the functionality of a full single-contact T501-SC into a front-end module. Up to four simultaneous contacts are supported using the T501-XC chassis. Each front-end module is hot-swappable and automatically configured for data processing. The T501-XC chassis connects to the T501-host system using dual high-rate USB 2.0 links for further data processing, recording/playback, and network distribution of the data.

The T501-VM is a full-featured software-only version of the T501-SC product. With network-based (TCP and UDP) cryptographic products arriving in the market, the need no longer exists for hardware-based RS-422/ECL serial conversion. In many cases, this eliminates the need for the FPGA-based DFP cards. The T501-VM answers this market shift by providing a cost-effective software solution that provides a fully-functional front-end product that can be installed on a customer-provided TT&C server. Since the performance of the T501-VM software modules is host platform dependent, RT Logic engineers are available to discuss optimum system architectures for high data rate applications.s.

## Standard Configurations

T501-SC: Single/Dual-contact T501 system based on 1U server platform with integrated DFP.

T501-XC: Multiple-contact T501 system, comprises host 1U server platform connected to the T501XC expansion chassis via a plug-and-play USB interface. The T501-XC expansion chassis contains two redundant, hot-swappable power supplies and a hot-swappable fan assembly to offer high availability for mission critical operations.

T501-VM: Single/Dual-contact software-only T501 system.

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RTL-DST_T501FEP_2013-0

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