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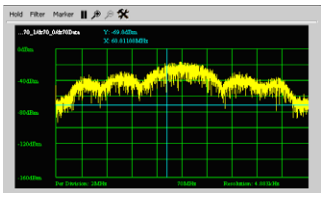
TELEMETRIX IF/BASEBAND UNIT (T70/70)

OVERVIEW

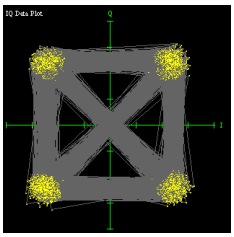


The RT Logic Telemetrix™ 70/70 (T70/70) is a modular, software-defined space modem and digital processing unit. It can be configured to support one or more channels of telemetry, commanding, command echo, ranging, and telemetry loopback simulation functions. External interfaces are 70 MHz IF and baseband (antenna side), and Ethernet or various digital protocols.

APPLICATION



The T70/70 is well suited for ground station and satellite test applications. The highly modular and flexible architecture allows the T70/70 to be easily customized for single or multiple stream applications with customer-selected test points and test functions. Digital spectrum analysis functions and display, as well as I/Q vector diagrams are available to assist in visualization of input signal characteristics. Internal Bit Error Rate (BER) firmware supports performance measurement with standard external BER testers. All signal processing is performed in software and Field-Programmable Gate Arrays (FPGAs), so new customized processing can easily be added. Control and status interfaces are network based and come with a platform independent Graphical User Interface (GUI) and Application Program Interface (API). Telemetry and command data interfaces can be configured as direct digital or network-based connections.

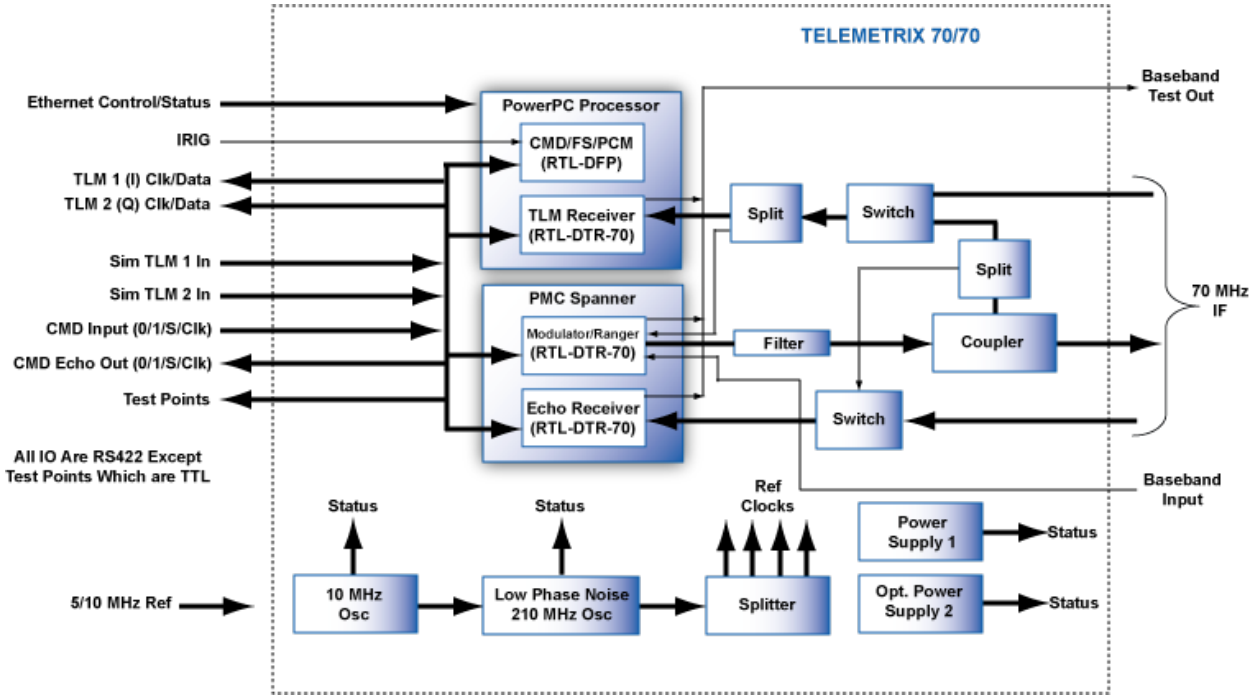


The system supports many of the basic processing functions of its sister product, the T70/70XL. It is recommended when a cost effective, single function or extremely compact multichannel product is needed, or when customized processing is required. The system interfaces with RT Logic's Frequency Conversion Subsystem (FCS) product to provide full RF-to-network capability. It also interfaces to the RT Logic T500GT for transfer of data/clock/time, and multistream MUX/DEMUX across a WAN.

FEATURES

- Telemetry Acquisition
  - IF Input Frequency: 50 To 90 MHz
  - IF Input Power Level: <-60 dBm To +10 dBm
  - Acquisition Range: ±1 MHz
  - Maximum Doppler Range: <10 kHz/sec
- Demodulation
  - Direct PSK (BPSK/QPSK/OQPSK/UAQPSK)
  - Symbol Rates: Up To 20 Msps
  - Subcarrier BPSK/QPSK
  - Subcarrier Frequency: 1 kHz To 20 MHz
  - Viterbi/R-S Decoding: Rate 1/2, CCSDS R-S
  - TDRSS Downlink: Spread Spectrum
- I/O
  - Baseband Input/Output
  - RS-422 Dedicated Inputs: 8 Pair
  - RS-422 Dedicated Outputs: 8 Pair
  - RS-422 Selectable I/O: 4 Pair
  - TLL Selectable I/O: 16 Signals
- Command Generator/Modulator
  - SGLS/USB Commanding
  - Output Frequency: 50 MHz To 90 MHz
  - IF Output Level: -40 dBm To 0 dBm
- Modulation
  - Direct PSK (BPSK/QPSK/OQPSK/UAQPSK)
  - 2 Subcarriers: SGLS/USB
  - Subcarrier Frequency: 1 kHz To 20 MHz
  - Analog Input: FM/PM/AM
  - TDRSS Uplink: Spread Spectrum
- Ranging
  - SGLS PRN Ranging
  - USB Tone Ranging
  - TDRSS Ranging
- Operating Environment
  - 0 ºC To 50 ºC
  - 10 % To 90 % Relative Humidity

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ARCHITECTURE

RT Logic's Telemetrix products form reconfigurable systems for satellite ground and test/range applications. The T70/70 is based on RT Logic's Digital Transmitter Receiver (DTR-70) and Digital Front-End Processor (DFP) PMC modules. The Dynamic Digital Modules (DDMs) provide a reconfigurable, digital platform for IF (70 MHz) and baseband processing functions.

- Receiver (DTR-70): An analog section on the DTR-70 filters the IF input that provides automatic gain control, and generates 12-bit digital samples of the received signal. The receiver supports PSK and subcarrier demodulation, bit synchronization, Viterbi decoding, and ranging. In addition to the IF input, the DTR-70 accepts baseband input, generates baseband and IF outputs, and has multiple TTL/RS-422 signal lines to support external interfaces.



- Transmitter (DTR-70): Implements a wide variety of signal modulation schemes. The full SGLS and STDN uplink spectrum is supported, including FSK/AM command tones, PSK subcarriers, PRN ranging, and main PM carrier. The modulator can also be used to generate complex downlink signals for test loops that include telemetry data (main carrier and subcarrier), command, and range tones.

- Digital Processing (DFP): Firmware personalities can be hosted to support frame synchronization, bit synchronization, signal multiplex/demultiplex, PCM simulation, Bit Error Rate test functions, command formatting, echo check, and Reed-Solomon encoding and decoding. The DFP provides multiple TTL, RS-422, and LVDS signal lines.



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RTL-DST-T7070 V1.2

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