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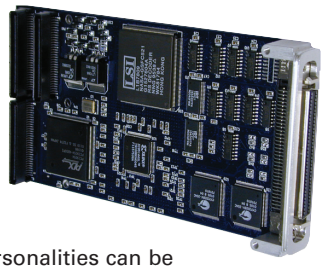
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DIGITAL FRONT-END PROCESSOR (RTL-DFP)

OVERVIEW



RT Logic's Digital Front-End Processor (RTL-DFP) is a high-performance, reconfigurable hardware module. RTL-DFP has the flexibility and versatility to implement many standard front-end functions for satellite ground, spacecraft test, and range/flight test applications. A full range of firmware and software personalities for processing telemetry, commands, and IRIG, and for controlling cryptographic equipment are available. Multiple personalities can be combined on a single RTL-DFP.

APPLICATION

The RTL-DFP provides a modular, programmable platform for high-performance digital processing functions. The PCI Mezzanine Card (PMC) is designed for use in PCI, cPCI, and VME systems.

The RTL-DFP has multiple on-board Field-Programmable Gate Arrays (FPGAs) that provide nearly one million logic gates for the downloaded firmware. In addition, the board has a high-speed Reed-Solomon encoding/decoding ASIC, a phase-locked loop (PLL) clock multiplier, an analog-to-digital converter (ADC), and 256K Bytes of dual-port memory. The RTL-DFP provides multiple TTL, RS-422, and LVDS signal lines to support a wide variety of signal interfaces and data rates.

RT Logic provides firmware personalities for the RTL-DFP that support telemetry and command processing functions such as frame synchronization, PCM simulation, command formatting, and echo checking. KG controller interfaces are available for most encryptors and decryptors. Other functions include the AFSCN ADCCP interface and IRIG time decoding.

Sample application code and device drivers are available for the RTL-DFP to support customer integration of the module.

FEATURES

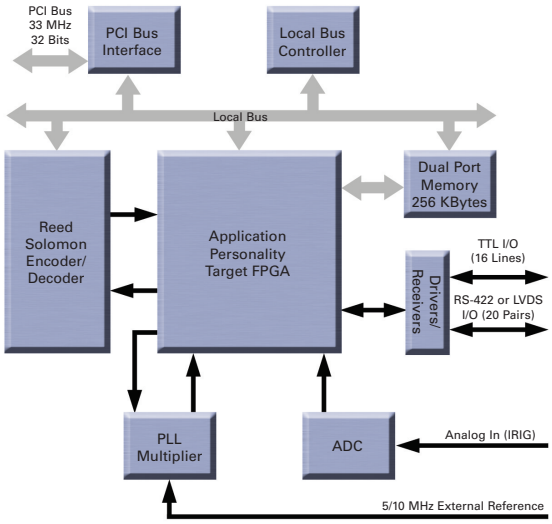
- Telemetry Application Personalities
  - Frame Synchronizer/CCSDS Transfer Frame Processor
  - Viterbi Decoder, Reed Solomon Encoder/Decoder
  - PCM Simulator/Bit Error Rate Tester
  - IRIG Time Code Processor (IRIG-A, -B, -E, -G)
- Commanding Application Personalities
  - Format Conversion (Binary, Ternary, Di-Bit (EXU))
  - Encryptor Interface
  - Echo Checking
  - Fill Command/GCC Generation
  - CCSDS Telecommand Formatting/COP-1 Processing
- Other Personalities
  - KG Controller (Elwell, Mykotronx, KI-17)
  - AFSCN ADCCP Interface
  - Spacecraft Umbilical Interfaces
- Test Code/Device Drivers
- Full Product Documentation/Customer Support

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DIGITAL FRONT-END PROCESSOR

MULTIPLE APPLICATION FIRMWARE PERSONALITIES

The RTL-DFP provides a configurable platform for hosting one or more of RT Logic's firmware application personalities. For example, the module can be configured to provide a dual frame synchronizer (up to 10 Mbps per stream) with IRIG time-tagging. The module can also be configured to provide a CCSDS return-link processor with Viterbi decoding, Reed-Solomon decoding, and transfer frame synchronization. Commanding personalities support the full range of spacecraft, KG, and external interface formats.



RT Logic can customize firmware application personalities or develop new ones to meet specific customer requirements.

The RTL-DFP module is part of RT Logic's family of Telemetrix Dynamic Digital Processors. This set of PMC modules supports the full spectrum of IF/baseband processing, signal modulation, and digital front-end functions and offers leading edge digital technology.

SPECIFICATIONS

- **I/O Data Rates**
  - RS-422, up to 32 Mbps
  - LVDS, up to 400 Mbps
- **Inputs/Outputs**
  - Up to 56 TTL Lines
  - Up to 20 RS-422 Pairs (40 Lines)
  - Up to 20 LVDS Pairs (40 Lines)
  - 5/10 MHz Reference
  - IRIG Input (AM or DC Level Shift)
- **Firmware Target**
  - Up to 200 MHz Clock Rate
  - ~1M Logic Gates
- **PCI Bus Interface**
  - 132 MByte/second DMA Transfer Rate
  - 33 MHz Clock Rate, 32 Bits Wide
- **Other On-Board Circuitry**
  - 256 KBytes Dual Port Memory
  - PLL Multiplier, Up to 130 MHz, Jitter<40 psec
  - ADC for IRIG AM Input
- **Application Personality Performance**
  - Telemetry — up to 100 Mbps
  - Commanding — up to 5 Mbps
  - IRIG — 100 nsec Resolution
  - AFSCN — C/C/S ADCCP Interface
  - Spacecraft Umbilical — Hardware-Level Handshake
- **Physical**
  - Single Wide PMC Form Factor
  - Short PCI (via Carrier Board)
- **Power (Typical)**
  - 2A @ 5V
- **Operating Environment**
  - 0 to 50° C
  - 10 to 90% Relative Humidity

RT Logic!

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