RT Logic RTL-VM70

Digital Vector Modulator

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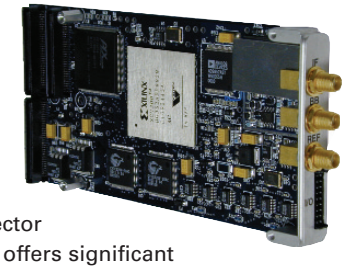
DIGITAL VECTOR MODULATOR (RTL-VM70)

OVERVIEW



RT Logic's Digital Vector Modulator (RTL-VM70) features the latest advances in high-speed digital technology to generate complex modulated waveforms. The modulated output is produced at baseband (up to 10 MHz) and IF (70 MHz) frequencies. FPGA-based firmware generates the signal envelope (I and Q) mathematically, and the carrier modulation is produced through a digital vector modulator. This digital signal generation technique offers significant performance advantages over traditional analog methods.

APPLICATION

The RTL-VM70 implements a wide variety of signal modulation schemes. The PCI Mezzanine Card (PMC) is designed for use in PCI, cPCI, and VME systems.

The RTL-VM70 supports the full SGLS and STDN uplink spectrum, including FSK/AM command tones, PSK subcarriers, PRN ranging, and main PM carrier. The RTL-VM70 can also be used to generate complex downlink signals for test loops that include telemetry data (main carrier and subcarrier), command, and range tones. Other modulation schemes can be implemented via the on-board firmware.

The RTL-VM70 is used within RT Logic's Telemetrix™ 70/70 system to generate a command/ranging uplink or simulated telemetry downlink at baseband and IF frequencies.

Sample application code and device drivers are available for the RTL-VM70 to support customer integration of the module.

FEATURES

- Digital Vector Modulation
  - Negligible Amplitude or Phase Errors
  - Digital Implementation of Shaping Filters
  - Minimal Device Variability
- Supported Carrier and Subcarrier Modulation Schemes
  - Multi-Tone (Command/Ranging)
  - FSK/AM (SGLS Command Tones)
  - STDN (USB) Commanding
  - PSK (BPSK, QPSK, SQPSK, others)
  - PM
  - FM and FM/FM
- Generate Command/Ranging Uplinks
- Generate Simulated Telemetry Downlinks
- IF and Baseband Outputs
- Data Rates Up to 2.5 Mbps
- Test Code/Device Drivers
- Full Product Documentation/Customer Support

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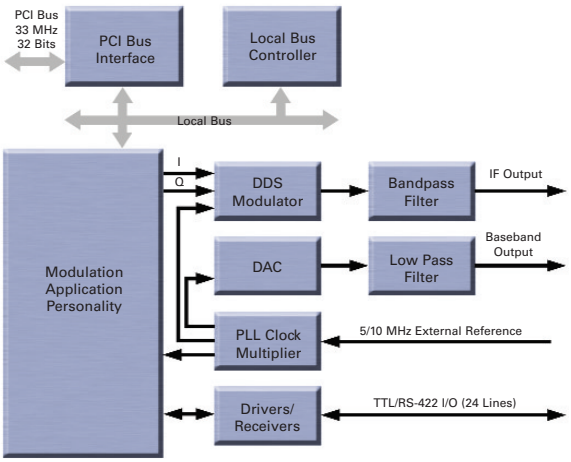
DIGITAL VECTOR MODULATOR

SUPERIOR DIGITAL MODULATION TECHNIQUE

The RTL-VM70 uses an FPGA firmware-based digital signal generator to generate a modulated output. The complex waveform generator (CWG) on the RTL-VM70 generates the I and Q functions in real time. A digital I/Q modulator produces the 70 MHz carrier and modulates it with the I and Q waveforms from the CWG. The RTL-VM70 also has an on-board D/A converter that is used to generate a baseband output.



The RTL-VM70 module is part of RT Logic's family of Telemetrix Dynamic Digital Processors. This set of PMC modules support the full spectrum of IF/baseband processing, signal modulation, and digital front-end functions and offer the latest leading edge digital technology.

SPECIFICATIONS

- **Data Rates**
  - 50 bps to 2.5 Mbps
- **Inputs**
  - 5/10 MHz Reference
  - Ternary Commands (TTL or RS-422)
  - Di-bit (EXU) Commands (TTL or RS-422)
  - PCM Clock/Data (TTL or RS-422)
  - PRN — up to 1 Mbps
- **Outputs**
  - Baseband (DC to 10 MHz)
  - IF (70 MHz ±5 MHz)
  - Signal Range — -55 dBm to 0 dBm
  - Spurious — -55 dBc from dc to 100 MHz
  - KG Black Clock
- **SGLS Modulation**
  - Data Rates — 1, 2, and 10 kbps
  - 'S' Tone — 65 kHz ± 0.01%, 1.073 MHz ± 0.1%
  - '0' Tone — 76 kHz ± 0.01%, 1.024 MHz ± 0.05%
  - '1' Tone — 95 kHz ± 0.01%, 0.975 MHz ± 0.1%
  - Tone-to-Tone Amplitude Variation — 0.4 dB Max
- **STDN Modulation**
  - Subcarrier Modulation (8 or 16 kHz)
  - Idle Pattern Insertion
  - Clock Summing and Modulation
- **PSK Modulation**
  - Data Rates — up to 2.5 Mbps
  - Subcarrier Frequencies — up to 8 Mbps
  - Subcarrier Data Rates — up to 256 kbps
- **Physical**
  - Single Wide PMC Form Factor
  - Short PCI (via Carrier Board)
- **Power (Typical)**
  - 2A @ 5V
  - 100 mA @ +12V, 100 mA @ -12V
- **Operating Environment**
  - 0 to 50° C
  - 10 to 90% Relative Humidity

RT Logic!

Specifications subject to change.
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