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Find the *Mercury Computer Systems / Echotek ECTR-GC314-PMC* at our website: *Click HERE*

ECHOTEK™ SERIES

DATASHEET

Computer Systems, Inc. MERCURY

12-Channel Digital Transmitter Module

Flexible Multi-Channel Digital Upconverter

- Excellent dynamic performance characteristics
- User-selectable configuration modes
- Coherency across multiple boards



ECTR-GC314-PMC

The Echotek™ Series 12-channel digital transmitter from Mercury Computer Systems is a flexible, multi-channel narrowband/wideband digital upconverter with excellent dynamic performance characteristics. The transmitter supports narrow and wide bandwidth frequency upconversion applications, where channel-to-channel synchronization is required. These characteristics make this module ideal for the demanding requirements of beam forming, signals intelligence (SIGINT), radar, and software defined radio (SDR) applications.

The module supports up to 12 narrowband digital input streams, which are interpolated, band-shifted, summed, and output as one or two coherent, real analog signals. Band spreads can be up to 40 MHz on up to a 70 MHz IF carrier. Alternatively, the board can accept a single wideband input, which is limited by the PCI bus throughout. This signal is interpolated and band-shifted to the maximum output frequency of 95 MHz. Analog output in the wideband mode is available as either real or complex.

The two outputs of the transmitter are coherent, and the board is configured to support coherency across multiple boards. Outputs are corrected for the sin(x)/x roll-off characteristic of D/A converters and are flat to within 0.05 dB across the full bandwidth of the upconverter.

Industry-Standard PMC Module

The board is built to the industry-standard single-wide PMC specification with the PCI interface supporting a combination of 66 MHz or 33 MHz clock speeds with 64-bit or 32-bit data width.

The transmitter has the following elements:

• The PCI interface uses PLX technology. It can operate at several levels: 64 bits, 66 MHz; 32 bits, 64 MHz; 64 bits, 33 MHz; and 32 bits, 32 MHz.

• Three 4-channel TI GC4116 quad upconverter ASICs interpolate the complex data input stream, from 32 to 5792, and upconvert to a user-selected frequency. The output can be summed together to provide up to 12 channels in the combined output data stream.

• Based on the operational configuration, the Altera Stratix™ FPGA implements input data FIFO buffers to provide post-ASIC frequency upconversion, interpolation filters, inverse sinx/x function, and data formatting.

• Two TI DAC 5675 14-bit MSPS D/A converters provide the final analog output via an SMA connector.

User-Selectable Configuration Modes

The transmitter can operate on one of the following modes, based on the user-selected configuration loaded in flash memory.

Single-Channel Narrowband Mode

This mode provides a single, real output. Up to 12 channels of narrowband data can be stored in up to 12 independently controlled sample FIFOs, and serialized to the digital upconverters (GC4116s). See Figure 2.

Dual-Channel Narrowband Mode

This mode provides two real outputs. This mode is similar to the single-channel narrowband mode, except that the sum output path after the second cascaded digital upconverter and the sum output after the third cascaded digital upconverter are both routed back into the Stratix FPGA. See Figure 3.

Wideband Mode

This mode provides both in-phase and quadrature outputs. The digital upconverters (GC4116s) are bypassed in this mode. See Figure 4.

Driver Support

Drivers are supplied for VxWorks®, Windows® NT, and Linux® operating systems.

Features

- Single-slot PMC module
- One complex output channel or two real channels
- Up to twelve combined narrowband channels
- Two 14-bit, 400 MSPS D/A converters
- Multi-card synchronization control
- Time-based start of transmission
- Custom wideband version available

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Ordering Information

Model	Part Number
ECTR-GC314-PMC	12-0127/CC510A

Specifications

Ruggedization level: Commercial

Temperature	
Operating	0°C to 55°C with 300 ft/min airflow
Storage	-50°C to +85°C
Vibration	$0.002g^2$/Hz from 10 Hz to 2000 Hz random and 2g sinusoidal from 5 Hz to 500 Hz
Shock	20g peak sawtooth, 11 ms duration
Humidity	Up to 95% RH
Cooling	Commercial grade, cooled by blown air, for use in benign environments and software development applications

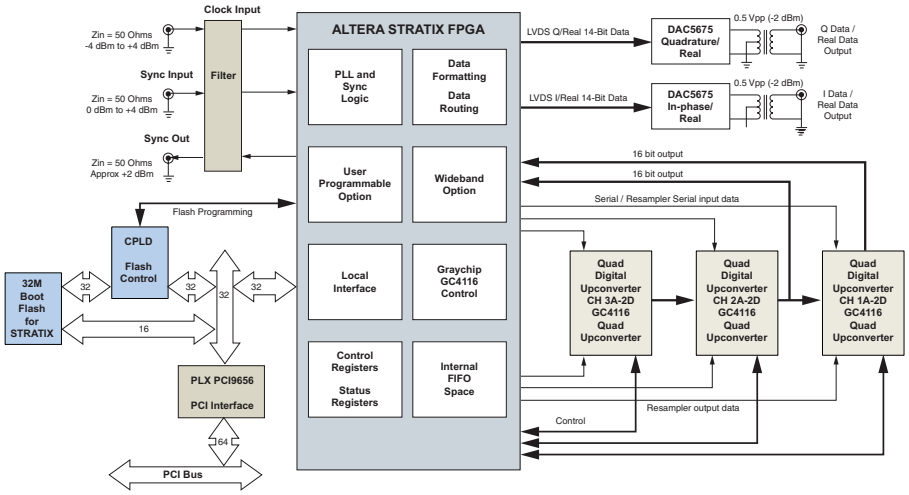


Figure 1. *ECTR-GC314-PMC block diagram*

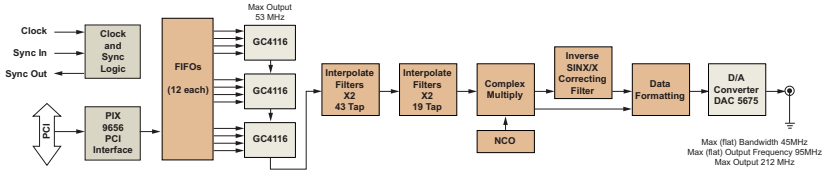


Figure 2. *ECTR-GC314-PMC Single-channel narrowband version block diagram*

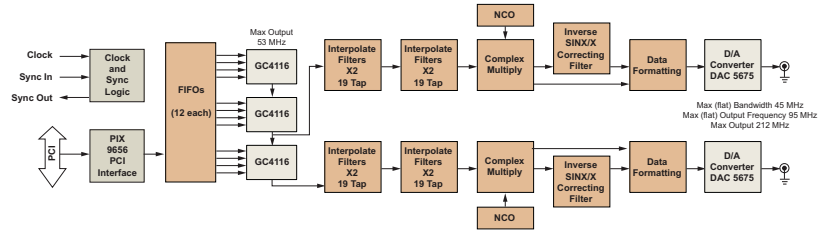


Figure 3. *ECTR-GC314-PMC Dual-channel narrowband version block diagram*

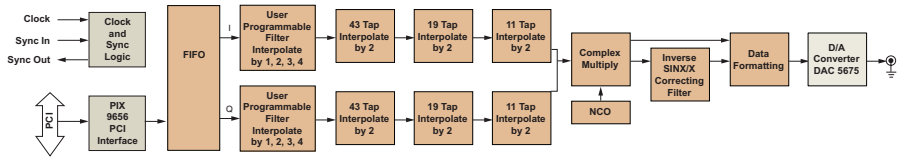


Figure 4. *ECTR-GC314-PMC Wideband version block diagram*

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