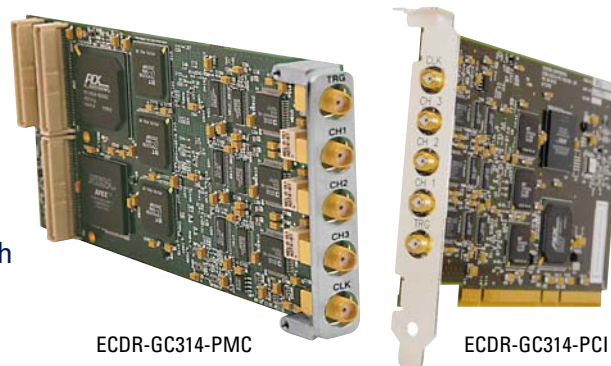


# 12-Channel Digital Receivers with Integrated Analog Input

## High-Speed, High-Resolution A/D Conversion and Digital Receiver Processing

- Wideband and narrowband downconversion and filtering
- Choice of single-slot PMC or PCI short card
- Flexible receiver-channel combinations offer wider bandwidth



The Echotek™ Series 12-channel digital receiver with integrated analog input from Mercury Computer Systems combines high-speed and high-resolution analog-to-digital conversion with digital receiver processing suitable for wideband and narrowband downconversion and filtering. It comes in a choice of either a single-slot PMC or a PCI module.

### Module Processing Chain

The module processing chain consists of the following elements.

#### IF Inputs

Three IF input channels at frequencies >200 MHz are digitized using 14-bit A/D converters (Analog Devices AD6644/45) with SFDRs in excess of 90 dBFS.

#### Receiver Channels

The digitizer outputs from the three A/D converters interface to the input crossbar switch on the Graychip GC4016 multi-standard quad digital downconverters. (See Figure 2). The Graychip GC4016 contains four such channels. The digital receiver supports the channel-combination configurations allowed by the Graychip GC4016:

- With no channels combined, the four narrowband outputs from the Graychip 4016 each support decimations of from 32 to 16,384.
- With two channel pairs, the two output channels from the Graychip GC4016 each support decimations of 16 to 8192.
- With all four channels combined, the one wideband output channel supports 8 to 4096 decimations.

#### Receiver Bypass

The digital receiver supports a software-selectable receiver bypass mode, so that it can be operated as an A/D converter only.

#### Data Buffering

Each channel's data is stored in a FIFO buffer. The FIFO buffer depth is managed in conjunction with the receiver channel's configuration mode. In 4-channel receiver mode, the FIFO standard depth is 16K samples/channel; in 2-channel mode, the depth is 32K samples/channel; in single-channel mode, it is 64K samples/channel. Other depths are optionally available.

#### PCI Interface

The FIFOs are interfaced to a 64-bit, 66 MHz PCI interface FPGA. Two onboard DMA controllers are provided to transfer receiver or A/D data via the PCI bus. DMA chaining is supported via a linked-list using PCI memory. All setup and control registers are accessible via the PCI interface.

#### Drivers

Software device drivers and test code are available for VxWorks®, Windows® NT, and Linux® operating systems.

#### Features

- Generates high-quality clock output, frequency is VCO dependent
- Generates a divided slow clock output: high-speed clock divided by 12 to 1024 in steps of 4
- Outputs have 50% duty cycle
- External reference input to PLL or 10 MHz onboard reference
- Trigger output aligned to clock rising edge, based on an external trigger input
- Programmable trigger width: 6 to 512 clocks wide in steps of 2
- Choice of 6U VME or PCI form factor
- PCI size has PCI Version 2.1-compliant bus interface
- PCI interface supports 3.3V and 5V I/O

## Ordering Information

Model	Part Number	Options
ECDR-GC314-PMC-65	12-0103/CC419A	3-channel, 65 MHz A/D receiver chips
ECDR-GC314-PMC-80	12-0103/CC455A	3-channel, 80 MHz A/D receiver chips
ECDR-GC314-PMC/2-80	12-0125/CC464A	2-channel, 80 MHz A/D receiver chips
ECDR-GC314-PMC-105	12-0103/CC588	3-channel, 105 MHz A/D receiver chips
ECDR-GC314-PMC/2-105	12-0125/CC475	2-channel, 105 MHz A/D receiver chips
ECDR-GC314-PCI-80	12-0120/CC490	3-channel with 80 MHz A/Ds
ECDR-GC314-PCI/2-80	12-0135/CC488	2-channel with 80 MHz A/Ds
ECDR-GC314-PCI-105	12-0120/CC485	3-channel with 105 MHz A/Ds
ECDR-GC314-PCI/2-105	12-0135/CC574	2-channel with 105 MHz A/Ds

## Specifications

Ruggedization level Commercial

### Temperature

Operating 0°C to 55°C with 300 ft/min airflow  
Storage -40°C to +85°C

### Vibration

0.002g<sup>2</sup>/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

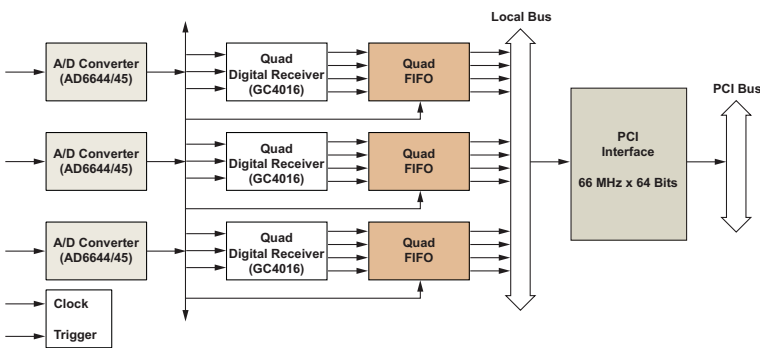


Figure 1. ECDR-GC314-PMC/PCI functional block diagram

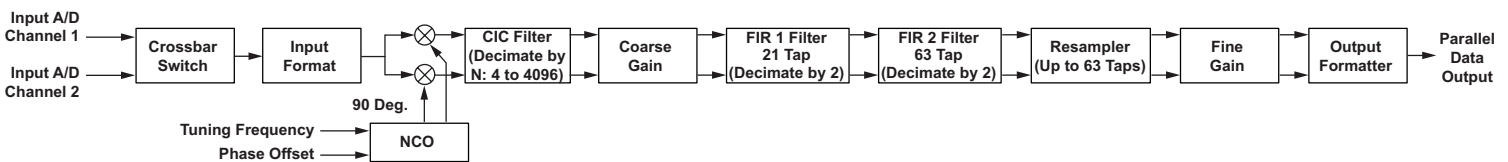


Figure 2. Receiver Channel block diagram

Echotek is a trademark of Mercury Computer Systems, Inc. Other products mentioned may be trademarks or registered trademarks of their respective holders. Mercury Computer Systems, Inc. believes this information is accurate as of its publication date and is not responsible for any inadvertent errors. The information contained herein is subject to change without notice.

Copyright © 2005 Mercury Computer Systems, Inc.

404-01E-1006-echoedrgc

Computer Systems, Inc.  
**MERCURY**  
Challenges Drive Innovation™

### North America

199 Riverneck Road • Chelmsford, MA 01824-2820 USA  
978-967-1401 • 866-627-6951 • Fax 978-256-3599

### Asia

No. 2 Gotanda Fujikoshi Bldg. 4F • 5-23-1 Higashi Gotanda • Shinagawa-ku, Tokyo 141-0022 JAPAN  
+81 (0) 3 5420 3881

### Europe

Immeuble Le Montreal • 19 bis, avenue du Quebec • Villebon-sur-Yvette • 91951 Courtaboeuf Cedex FRANCE  
+33 (0) 1 69 59 94 00