

ICS-8554D

Rugged 4-channel, DC-Coupled 105 MHz ADC PMC Module with DDCs, Xilinx FPGA and PCI 64/66 Interface

- 4 DC-coupled ADC channels: 14-bits @ 105 MHz
- 2 GrayChip GC4016 DDC ASICs
- 3M gate Xilinx Virtex-II FPGA
- 66 MHz, 64-bit PCI 2.2 DMA interface
- 2 MBytes FIFO buffer
- Pn4 user I/O supports LVTTTL or LVDS signaling levels
- Internal or external clock and trigger
- > 67 dB SNR and > 80 dB SFDR
- Multiple board synchronization
- Extensive application and technical support available
- VxWorks®, Linux® and Microsoft® Windows® device drivers

ICS-8554D 4-channel ADC PMC module is a rugged derivative of the highly successful ICS-554D, a four channel DC-coupled ADC PMC module for Software Defined Radio (SDR) applications optimized to provide a high degree of functionality in a small, rugged package. By bundling substantial ADC, DDC, and FPGA resources in one PMC module, the ICS-8554D provides a powerful base band signal processing capability. Careful component selection and thermal management techniques allow this functionality to be maintained in demanding environments, supported by both air-cooled and conduction cooled versions.

The board provides simultaneous sampling across all channels on one board or across multiple boards using either an internally or externally provided clock signal. Simultaneous triggering is also achieved across multiple boards using either an internal (software controlled) or external trigger signal.

The two optional GC4016 Digital Downconverters provide a powerful base-banding and filtering capability with the capability for NCO and parameter change capability across multiple channels and boards using internal or external synchronization via a sync connector. Up to 8 simultaneous output bands can be provided. Simultaneous wide and narrow output bands are supported via the two decoupled FIFOs.

While providing substantial DSP resources in its 3M gate FPGA, the ICS-8554D still provides high bandwidth I/O for communication with host systems. The 64/66 PCI interface provides data rates in excess of 400 MBytes/sec (aggregate sustained rate), while the Pn4 User I/O port allows even higher data rates and elimination of interrupt latencies. Approximately 95% of the Virtex-II FPGA is available for user applications, and these are supported by means of a comprehensive Hardware Development Kit (HDK) for the Xilinx ISE Foundation development environment, enabling efficient development of new FPGA applications.

The ICS-8554D brings all the best attributes of the ICS-554D to the rugged application space, and improves on it by doubling the amount of FIFO buffer onboard, and adding built in test (BIT) capability. The FIFO buffer consists of two decoupled FIFOs, thus allowing for applications in which simultaneous wide and narrow output bands are required.

Software

Software device driver support is available for VxWorks, Linux and Windows. A set of application examples in 'C' is provided with each driver. A LabVIEW application is provided under Windows only. An SCA-compliant driver can also be provided.

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Specifications

Analog Input

- 4 analog inputs, DC-coupled
- MMX analog, clock, trigger, sync connectors
- 50 Ohm input impedance
- Full scale input +3dBm into 50 Ohms (nom.)
- Max. safe input +24dBm into 50 Ohms
- Input bandwidth 0 – 50 MHz (-3dB)
- Max. sampling rate 105 MHz, 100 MHz when using DDCs
- Min. sampling rate 30 MHz
- Internal sample clock 100 MHz
- ADC resolution 14 bits
- Sampling on rising edge of clock
- LVTTTL or sinewave ext. clock
- LVTTTL external trigger, sync signals
- SINAD > 67dB
- SFDR > 80 dB
- Harmonic Distortion < -72 dBc
- Crosstalk < -72dB

General

- IEEE Std. P1386.1-2001 compatible PCI Mezzanine Card
- ANSI/VITA 20-2001 Conduction Cooled PMC
- VxWorks, Linux and Windows software drivers
- 11.8 Watts typical power dissipation (depends on user FPGA contents)
- MMX coaxial connectors (signals, clock, trigger, sync)

Onboard Resources

- Xilinx Virtex-II FPGA (XC2V3000)
- 2 x GC4016 DDC (optional)
- 2 x 128k x 72 FIFO memories

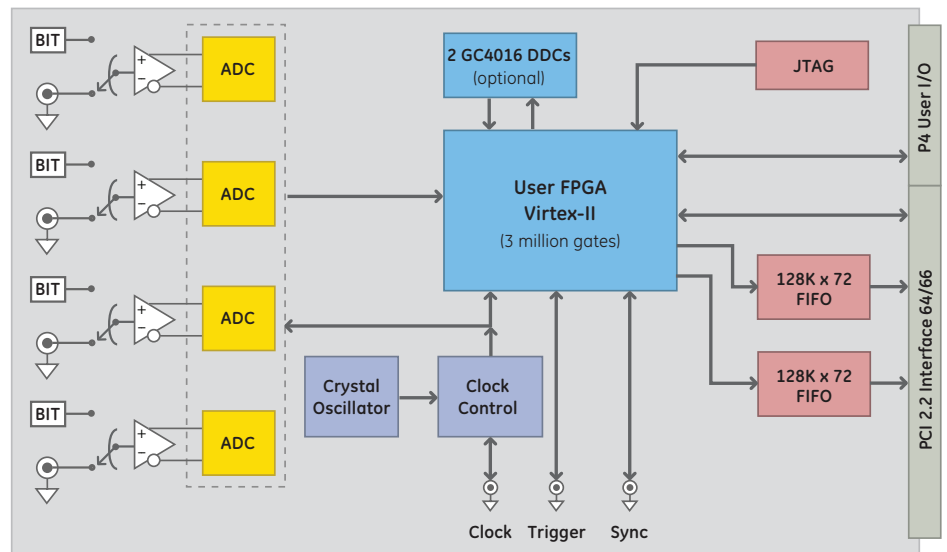
I/O Specifications

- PCI 2.2 64-bit, 66 MHz PCI bus interface
- All 64 user programmable I/O via Pn4 connector routed directly to FPGA as differential pairs
- User definable signaling levels on Pn4 (LVDS, LVTTTL)

Environmental

- Five build levels available. Air and Conduction cooled versions.
- Up to -40 to +85 °C operating temperature available
- 95% non-condensing humidity

Block Diagram



Ordering Information

ICS-8554D-x00	x: build level (1 – 5), with GC4016 DDCs
ICS-8554D-x01	x: build level (1 – 5), without GC4016 DDCs
DRV-8554-VXW	Software device driver for VxWorks operating system
DRV-8554-LX	Software device driver for Linux operating system
DRV-8554-WIN	Software device driver for Windows operating system
DRV-8554-SCA	SCA compliant driver
HDK-8554	Hardware Development Kit for FPGA development by user

About GE Fanuc Embedded Systems

GE Fanuc Embedded Systems is a leading global provider of embedded computing solutions for a wide range of industries and applications. Our comprehensive product offering includes many types of I/O, single board computers, high performance signal processors, fully integrated, rugged systems including flat panel displays, plus high speed networking and communications products. The company is headquartered in the U.S. and has design, manufacturing and support offices throughout the world. Whether you're looking for one of our standard products or a fully custom solution, GE Fanuc Embedded Systems has the breadth, experience and 24/7 support to deliver what you need. For more information, visit www.gefanucembedded.com.

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Additional Resources

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