



ICS-1556

4-Channel, 400 MHz 14-bit ADC PMC Module with Virtex-5 SX95T User Programmable FPGA

Features:

- 4 Transformer-coupled Analog Inputs, 14 bits
- $F_s \leq 400$ MHz per channel
- Xilinx Virtex-5 SX95T User Programmable FPGA
- PCI-X 64-bit/133 MHz Master/Target Burst Mode DMA capable
- 64 User I/Os via Pn4 connector routed directly to FPGA
- Pn4 LVDS or LVTTTL signal levels
- VxWorks, Linux and Windows software drivers

The ICS-1556 builds on the legacy of our industry-leading digital receiver families and brings a brand sensor processing platform to market. Designed for communications, radar and test & measurement applications, it provides unsurpassed ADC technology with industry-leading DSP expertise. The result is a cost-effective combination of size and performance in a single PMC site.

The ICS-1556 consists of four 14-bit ADCs sampling synchronously at frequencies up to 400 MHz. A Xilinx Virtex-5 SX95T FPGA is provided for user-defined signal processing functions, giving greater capacity and lower power consumption than earlier products.

A Graychip GC5016 digital down-converter (DDC) provides simultaneous down- and up-conversion of up to four arbitrary signal bands. It provides programmable decimation of 1 to 4K. Each band can be tuned to any arbitrary centre frequency within the pass band. Output data can be in either real or complex format, providing a maximum bandwidth of 160 MHz (-1dB) on each channel.

The FPGA is not used for board control functions, thus providing maximum occupancy for customer applications. It provides a powerful signal processing capability that can be loaded with standard functions such as wideband DDC, FFT and time stamping, or programmed by the user for any required function.

The product provides internal and external clock and trigger capability, and supports multiple board synchronous sampling both of ADC and DDC functionality.

A Hardware Development Kit (HDK) provides support for users who wish to implement their own signal processing algorithms in the FPGA.

Alternatively, our FPGA applications programming team can develop FPGA cores specific to customer needs. For more information on standard processing functions or custom development, contact your local sales manager.

A standard programmable wide band DDC core is provided with the HDK that may either be used by itself or to provide sample rate reduction for input to the GC5016 DDC.

64 User I/Os connected directly from the FPGA to the Pn4 connector provide an alternative high-speed data path to the module. The I/O pins can be factory-configured for LVTTTL or LVDS operation.

Memory resources consist of 16 Mbytes of QDR II SRAM. The standard memory design implements four FIFOs, but the memory may be used in different ways, or for scratchpad, if required.

The ICS-1556 can be used with any type of carrier card that will accept a PMC module, including VME, PCI and CompactPCI. When used with an appropriate DSP/processor carrier card, the ICS-1556 offers a powerful single slot solution for software radio applications.

Software Development Kits (SDK) are available for VxWorks, Linux and Windows operating systems. Each SDK includes operating examples in 'C'. The Windows SDK also includes a LabVIEW application.

The product is ideally suited for demanding applications in military communications, 3G and 4G cellular base station development, signal intelligence, smart antenna, radar beam forming, wireless test & measurement and satellite ground stations.

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Specifications

Analog Input

- Four transformer-coupled analog inputs
- Analog to digital resolution 14 bits
- 50 Ohm input impedance
- Full scale input voltage 5dBm (1.125 Vpp)
- Input signal bandwidth of 4.5 MHz to 1400 MHz (-3 dB point)
- Maximum sample rate of 400 MHz/channel
- Minimum sample rate of 20 MHz/channel
- Internal sample clock oscillator 400 MHz
- Sampling on rising edge of internal or external sample clock
- External trigger LVTTTL/LVCMOS 5V tolerance, software selectable Rising/Falling edge
- External sync. LVTTTL/LVCMOS 5 V tolerance, software selectable Rising/Falling edge
- External clock LVTTTL/Sinewave compatible, -3 dB min. ~ +6 dBm max.
- S/(N+D) > 62 dBFs @ f in = 200 MHz @ 400 MSPS, typ.
- SFDR 75 dBc @ f in = 200 MHz, typ.

General

- IEEE std. 1386.1-2001 PMC compatible
- VxWorks, Linux and Windows software drivers

Onboard Resources

- Xilinx Virtex-5 SX95 user programmable FPGA
- 16 MBytes of FIFO memory
- SMC connectors

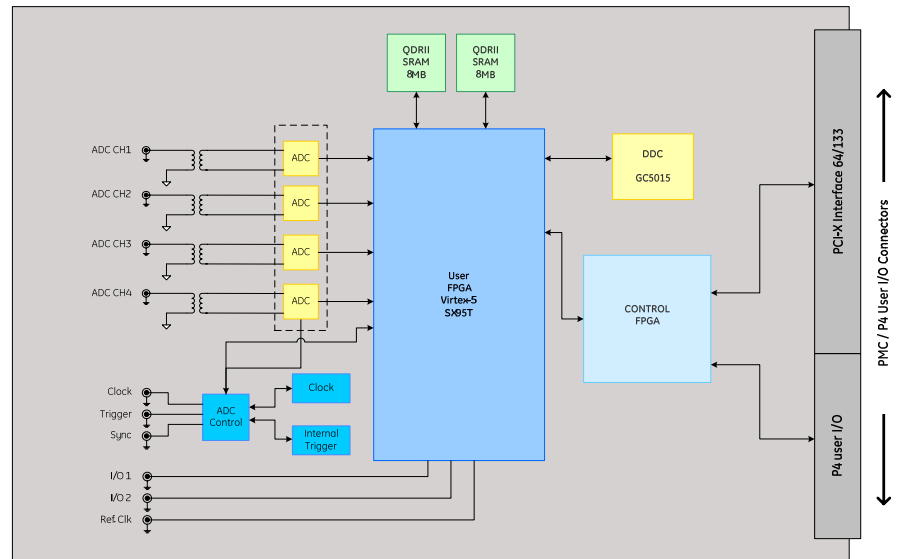
I/O Specifications

- PCI-X 64-bit 133 MHz Master/Target Burst Mode DMA capable
- All 64 user programmable I/O via Pn4 connector routed directly to FPGA
- Pn4 LVDS or LVTTTL signal levels, factory applied termination option

Environmental

- Operating temperature, 0°C to +55°C
- Storage temperature, -40°C to +85°C
- 95% non-condensing humidity
- Required cooling 200 LFM

Block Diagram



Ordering Information

Part Number	Description
ICS-1556	ICS-1556, 1-channel, no DDCs
ICS-1556B-000	ICS-1556, 2-channel, no DDCs
ICS-1556B-001	ICS-1556, 4-channel, no DDCs
ICS-1556B-002	ICS-1556, 1-channel, with DDCs
ICS-1556B-003	ICS-1556, 2-channel, with DDCs
ICS-1556B-004	ICS-1556, 4-channel, with DDCs
ICS-1556B-005	ICS-1556, 4-channel, with DDCs

DRV-1556-VXW

Software development kit for VxWorks operating system

DRV-1556-LX

Software development kit for Linux operating system

DRV-1556-WIN

Software development kit for Windows operating system

HDK-1556

Hardware Development Kit for FPGA development by user, including default core (included with board)

About GE Fanuc Intelligent Platforms

GE Fanuc Intelligent Platforms 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 Intelligent Platforms has the breadth, experience and 24/7 support to deliver what you need. For more information, visit www.gefanucembedded.com call 1-800-GE Fanuc.

Preliminary Data Sheet – specifications are subject to change

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Additional Resources

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