ICS-1554

4-Channel, 160 MHz 16-bit ADC PMC Module with Virtex-5 SX95T User Programmable FPGA

Features

- Four AC-Coupled Analog Inputs
- Fs ≤ 160 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 LVTTL signal levels
- VxWorks®, Linux® and Windows® software drivers

Designed for communications, radar, and test & measurement applications, the ICS-1554 builds on the legacy of the industry-leading ICS-554 digital receiver family to provide 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-1554 consists of four 16-bit ADCs sampling synchronously at frequencies up to 160 MHz. Simultaneous down-conversion of up to 16 arbitrary signal bands is provided by four Graychip GC4016 digital down converters (DDCs). A Xilinx Virtex-5 SX95T FPGA is provided for user-defined signal processing functions, giving greater capacity and lower power consumption than previous generations.

The DDCs provide digital down-conversion of up to 16 narrowband, 8 split-I/Q or 4 wideband channels than can be tuned to any arbitrary center frequency within the pass band. Output data can be in either real or complex format, providing a maximum bandwidth of 10 MHz (-1 dB) 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 user for any required field.

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.

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 LVTTL or LVDS operation.

Independent operation of the two 1 MByte FIFOs facilities simultaneous wideband and narrowband signal processing.

The ICS-1554 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-1554 offers a very 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 AC-coupled analog inputs
- 50 ohm input impedance
- Full scale input voltage 1.48 dBm (0.75 Vpp) or 5 dBm (1.125 Vpp), software selectable
- Input signal bandwidth of 2 MHz to 700 MHz (-3 dB point)
- Maximum sample rate of 160 MHz/channel
- Minimum sample rate of 1 MHz/channel
- Internal sample clock oscillator 100 MHz
- Analog-to-digital resolution 16-bits
- Sampling on rising edge of internal or external sample clock
- External trigger LVTTL/LVCMOS 5V tolerance, software selectable rising/falling edge
- External sync. LVTTL/LVCMOS 5V tolerance, software selectable rising/falling edge
- External clock LVTTL/Sinewave compatible, -3 dB min. ~ +6 dBm max.
- S/(N+D) > 73 dBFs @ f in = 70 MHz @ 160 MSPS, typ.
- SFDR 84 dBc @ f in = 70 MHz, typ.

General

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

Onboard Resources

- Xilinx Virtex-5 SX95T user programmable FPGA
- 2 MBytes of FIFO memory
- SMA 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 router directly to FPGA
- Pn4 user definable LVDS or LVTTL signal levels

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
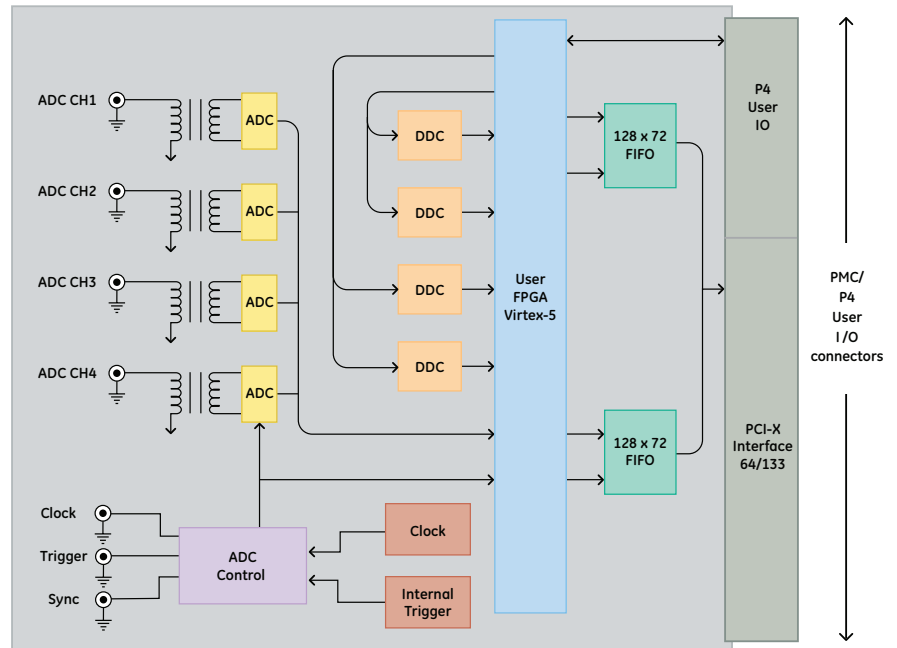
Ordering Information

ICS-1554A-000	ICS-1554, 1-channel, no DDCs
ICS-1554A-001	ICS-1554, 2-channel, no DDCs
ICS-1554A-002	ICS-1554, 4-channel, no DDCs
ICS-1554A-003	ICS-1554, 1-channel, with DDCs
ICS-1554A-004	ICS-1554, 2-channel, with DDCs
ICS-1554A-005	ICS-1554, 4-channel, with DDCs
DRV-1554-VXW	Software development kit for VxWorks operating system
DRV-1554-LX	Software development kit for Linux operating system
DRV-1554-WIN	Software development kit for Windows operating system
HDK-1554	Hardware Development Kit for FPGA development by user, including a 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.gefanuc.com.

GE Fanuc Intelligent Platforms Information Centers

Americas:
1 800 368 2738 or 1 703 263 1483

Asia Pacific:
+81 3 5544 3973

Europe, Middle East and Africa:
Germany: +49 821 5034-0
UK: +44 1327 359444

Additional Resources

For more information, please visit the GE Fanuc Intelligent Platforms web site at:

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