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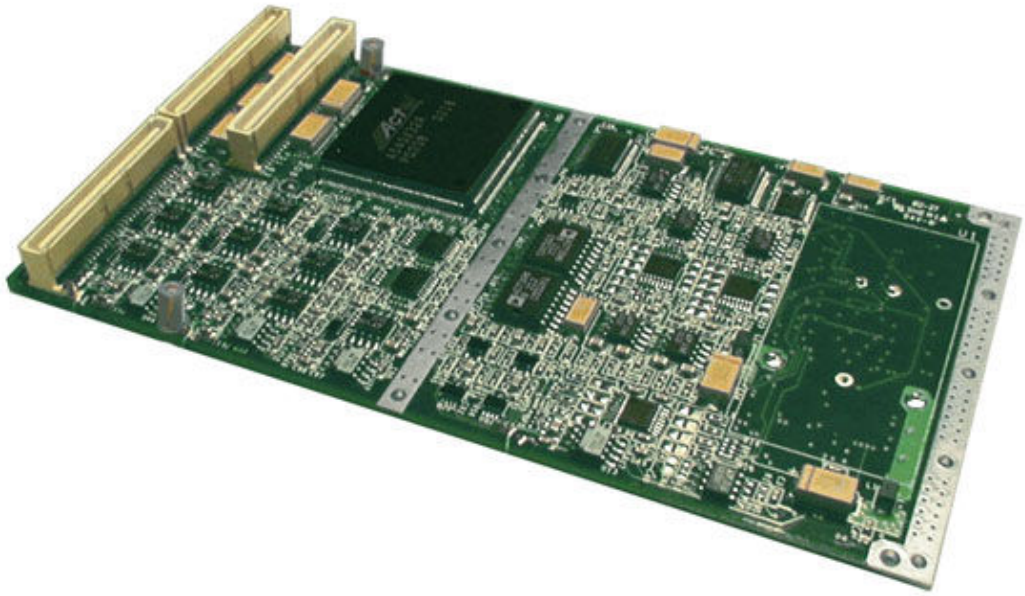
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M453
Analog I/O PMC

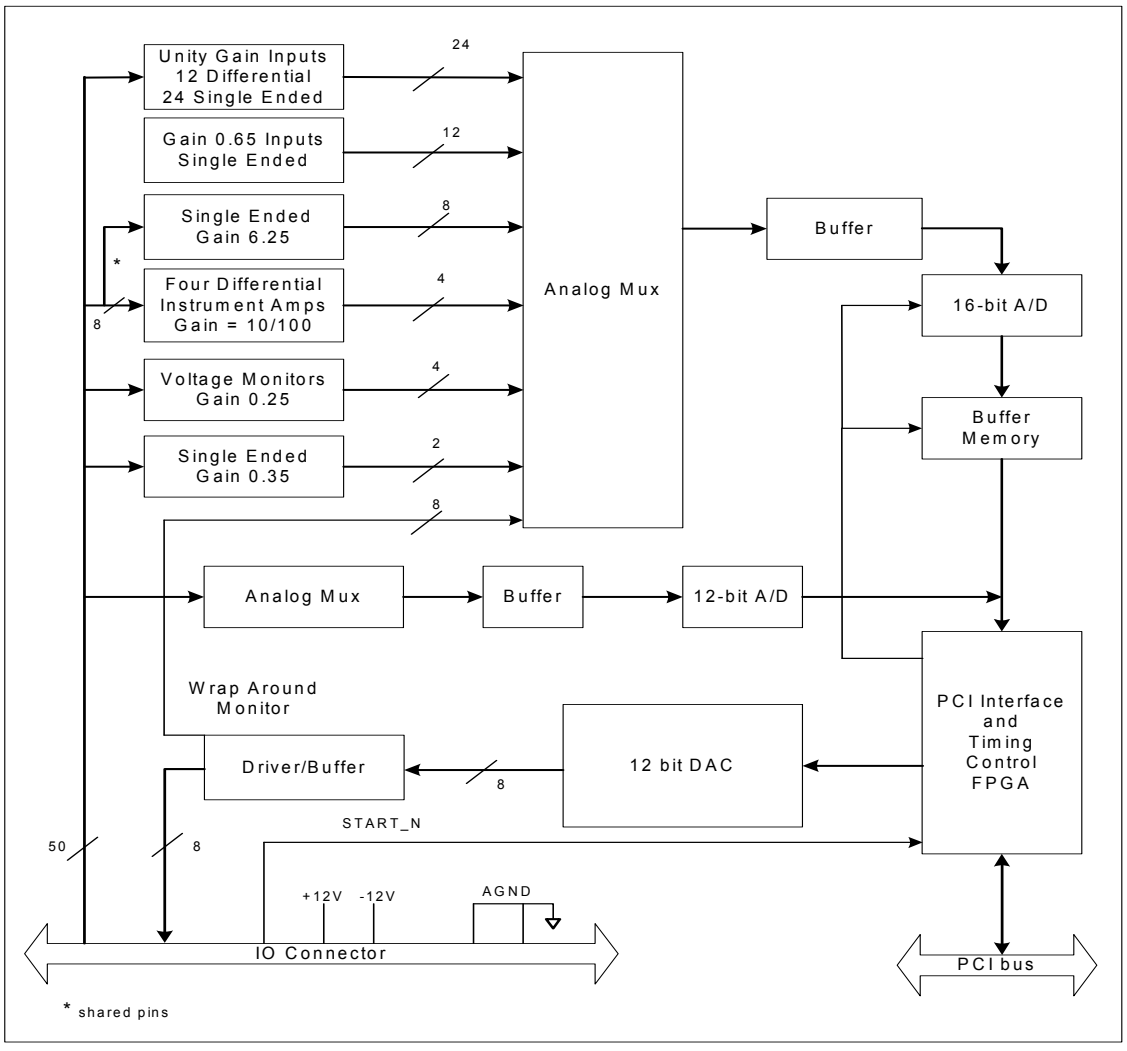


- *50 Analog Input Channels*
- *16-bit A/D Conversions at 100Ksps*
- *12 Differential or 24 Single-Ended Analog Input Channels with ±10 V Input Range*
- *12 Single-Ended Input Channels with ±15 V Input Range*
- *6 Single-Ended Input Channels with ±28 V Input Range*
- *High Gain Input Channels: 4 Instrument Amplifier Channels, Gain = 10/100; or, 8 Single-Ended Channels, Gain = 6.25*
- *Anti-alias Filter for All Analog Input Channels*
- *128 x 16-bit Storage for Each Analog Input Channel*
- *12-bit D/A Converter*
- *8 Single-Ended Analog Output Channels with ±10 V Output Range*
- *Redundant BIT Path for All External Analog Inputs Using 12-bit dedicated ADC*
- *Interrupt Capabilities Using PCI Interrupt Pins*
- *PCI 2.1 Interface Compliant, 32 bit @ 33 MHz PCI Bus Interface*
- *One Time Conversion or Selection of Analog Inputs Initiated by Either Hardware or Software Triggers*
- *Air-Cooled Version Compliant with IEEE 1386-2001 Specification*
- *Conduction-Cooled Version Compliant with ANSI/VITA20-2001*
- *Three Ruggedization Levels*
- *VxWorks® Drivers*
- *BIT (Built-in-Test) Available for Complete Functional Testability*

Aitech Defense Systems, Inc.
A member of the Aitech Rugged Group
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Analog I/O PMC

The M453 Analog I/O PMC board is designed to provide analog output and analog input on a cost effective and small industrial standard PMC form factor. The M453 provides a host processor card that has industrial standard PMC slot(s) with multiple channels of high resolution (16-bit) analog inputs and 12-bit analog outputs interfaces. The Analog I/O PMC interface supports 50 external analog input channels and 8 analog output channels. The on board memory provides 128 x 16-bit buffers for each input channel. The analog input channels are converted in series. The conversion time for each analog channel is programmable from 10 to 46 microseconds; from 700 microseconds to 2 milliseconds is the conversion time for of all channels. The User can program a port conversion list if less than all 50 channels are used.



M453 Block Diagram

Features

Architecture
The M453 architecture is based on Linear Technology LTC1605 16-bit resolution, 100ksps sampling analog to digital converter (ADC) and Analog Devices AD7398 Quad, serial input, 12-bit resolution digital to analog converter (DAC).

The M453 board converts all or selected analog inputs in series upon receiving either a hardware start signal (START_N) or software start command. Once the conversions are completed, a hardware DONE pulse is generated. The DONE pulse can be enabled by software to generate an interrupt to the host board via PCI bus interrupt pins. If the interrupt feature is not desired, the host board can poll the DONE status bit to determine whether the conversions are completed.

The digitized analog input data are stored in the on board buffer memory. The buffer memory provides up to 128 storage locations per analog input channel.

For analog outputs, the M453 board's DAC is updated when the host writes data to the assigned DAC register. The DAC analog output voltage will be at the set value in approximately 8 microseconds from the time the host writes to this register

The M453 board has two BIT paths. The first BIT path is intrusive to the analog inputs and is normally used offline. A controlled (BITstimulus) voltage is added into analog input channels. The software computes the input voltage as the value with BIT stimulus minus the value prior to the BIT stimulus; this measured change is compared to the predicted change. This BIT approach provides very high test coverage of the entire analog input path components. The second BIT path is non-intrusive and can be used either online or offline. A redundant analog input path to a 12-bit resolution ADC is used to monitor each of the analog input channels.

Differential Analog Input Channels
The M453 is equipped with 12 differential analog input channels with a gain of 1 that can be converted to 24 single-ended inputs.

The differential analog input channels are software selectable between differential inputs and single-ended inputs and have low pass anti-aliasing filters.

Single-Ended Analog Input Channels
The M453 has a total of 14 single-ended low gain input channels, 12 with a gain of 0.65 and 2 with a gain of 0.35. All of the single-ended analog input channels have low pass anti-aliasing filters.

High Gain Analog Input Channels
The high gain channels share 8 I/O connector pins.

- There are 4 differential instrumentation amplifier channels, each with a precision gain of 10/100; or,
- 8 single-ended channels with a gain of 6.25

Each of these input channels have low pass anti-aliasing filters.

Voltages Monitor Analog Input Channels
There are 4 voltages monitor analog input channels with low pass anti-aliasing filters and are equipped with a factory selectable gain.

PCI Bus Interface
The M453 incorporates a high performance PCI to Local Bus Bridge supporting 32-bit operation at 33 MHz and fully compliant with the PCI Rev. 2.1 specification.

Software

Test and Diagnostics Features

- Full Functional testability using internal BIT stimulus, redundant analog input paths, and analog output loop-backs.
- BIT software provided for loading on the host processor platform

Software Drivers
The M453 PMC is delivered with a complete set of VxWorks® drivers and BIT. These should be integrated into the carrier (host) VxWorks® platform.

Mechanical Features

The M453 PMC is available in two mechanical formats:

- Air-cooled per IEEE 1386-2001 for installation on top commercial and rugged air-cooled carrier boards.
- Conduction cooled per ANSI/VITA20-2001 for installation on top IEEE 1101.2 conduction-cooled carrier boards.

High power components are cooled by an aluminum heatsink.

Dimensions

- Air-cooled: per IEEE 1386-2001
- Conduction cooled: per ANSI/VITA 20-2001

Power Requirements

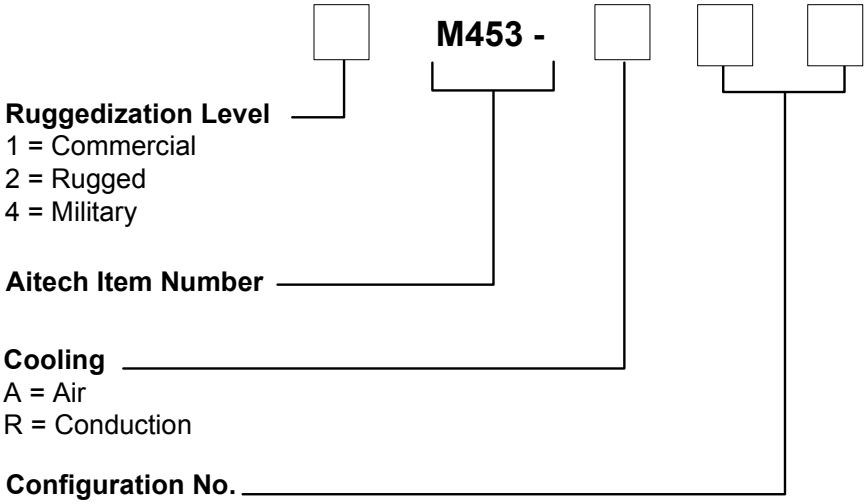
Total power consumption (maximum): 5W

+5V	(± 5%)	0.2A
+12V	(± 10%)	0.16A
-12V	(± 10%)	0.16A

Environmental Features

Please, refer to the Aitech ruggedization datasheet.

Ordering Information for the M453



Example: 4M453-A02

For more information about the M453 or any Aitech product, please contact Aitech Defense Systems sales department at (888) Aitech-8 (248-3248).

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