PCM-MIO-A-1

PC/104 Data Acquisition Module Including
16-Bit ADC, 12-Bit DAC, and 48 Digital I/O

Features

Analog Inputs

- 16-bit Analog-to-Digital converter (ADC) with sample-and-hold circuit
- Input ranges: 0-5V, 0-10V, ±5V, and ±10V
- Any combination up to 16 single-ended or eight differential input channels
- Each channel independently software programmable for input type and range
- ±25V input protection on each channel
- No missing codes over full range
- Low-noise DC/DC reference for accuracy
- Programmable interrupt

Analog Outputs

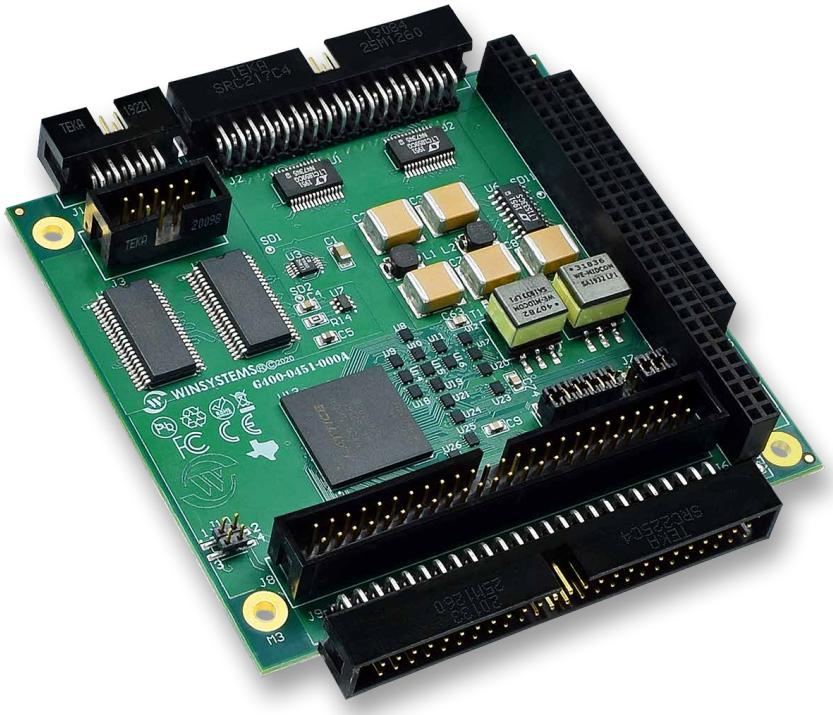
- Eight, 12-bit Digital-to-Analog converters (DAC)
- Output ranges: 0-5V, 0-10V, ±2.5V, ±5V, ±10V, and -2.5V to 7.5V
- Channels are independently software programmable
- Output channels can be updated and cleared individually or simultaneously

Digital Inputs/Outputs

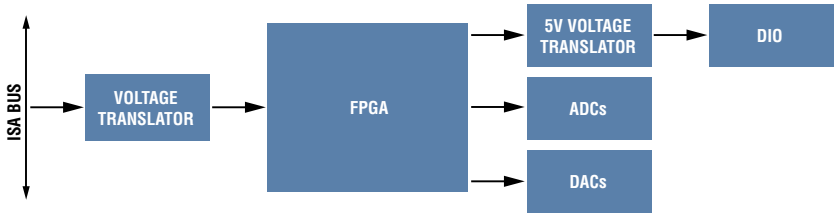
- 48 Bidirectional lines with Input, Output, or Output with Readback, 24 capable of event-sense interrupt generation
- 12mA sink current per line

General

- No calibration required
- Standard 0.100” headers for easy cable access
- Operating temperature: -40°C to +85°C
- +5VDC operation
- 3.6 x 3.8 Inches (90 x 96mm)
- Custom OEM configurations available
- Compatible with industry-standard I/O racks



Block Diagram



Product Description

The PCM-MIO-A-1 is a versatile, PC/104-based analog input, analog output, and digital I/O board designed for high-accuracy and high-channel count analog and digital I/O. The board is based upon Linear Technology’s precision converters and voltage references which require no external calibration. The digital I/O utilizes WINSYSTEMS’ versatile WS16C48 Universal I/O controller functionality, also available on many of our SBCs and other I/O products.

Analog Input Section – Two analog-to-digital converters (ADCs) are used on the board. Each contains an 8-channel multiplexer with ±25V protection. The multiplexer on each ADC can be programmed for single-ended inputs or pairs of differential inputs or combinations of both. The precision trimmed attenuators ensure accurate input ranges. All channels are fault protected so that a problem on one channel will not affect the conversion result of another channel.

The PCM-MIO-A-1 supports four input voltage ranges. Any input range is independently software selectable for each channel.

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Parhelia B.V.
www.parheliabv.com
+31(0)10 741 00 28

Product Description *(continued)*

The board will support up to 16 single-ended input channels, eight differential input channels or various combinations of both. This means that under software control, any channel can be set for either single-ended or differential along with its voltage range.

Analog Output Section – The PCM-MIO uses two Linear Technology SoftSpan™ quad Digital-to-Analog converters (DACs). They are software programmable for either unipolar or bipolar mode plus specific voltage range on a per channel basis.

There are eight independent, 12-bit, D/A channels, each with six programmable output voltage ranges. They are asynchronously cleared to 0V for all ranges when reset.

Digital Input/Output Section – The PCM-MIO-A-1 implements WINSYSTEMS' highly-versatile WS16C48, 48-line digital I/O controller in a field programmable gate array using ASIC compatible programmed logic. There are 48 bits of bidirectional digital I/O. Each I/O line is individually programmable for input, output, or output with readback operation. Each output channel is latched and has an open collector driver (with a pull-up resistor) capable of sinking 12mA of current. This allows direct control of up to 48 opto-isolated signal conditioning modules.

The major feature of the WS16C48 controller functionality is its ability to monitor the 24 lines of Port 0, 1, and 2 for either rising or falling digital edge transitions, latch them and then interrupt the host processor notifying it that a change-of-input status has occurred. Transition polarity is programmable and enabled on a bit-by-bit basis. Each line's transition is latched.

The pinout is compatible with the industry-standard I/O module mounting racks and WINSYSTEMS' termination cards.

PC/104 Interface – The PCM-MIO is I/O mapped, requiring 32 sequential port addresses. The addresses are jumper selectable on any even 32-port boundary. The control, data, and power signals are wired to a 16-bit stackthrough PC/104 connector.

Custom OEM Configurations – WINSYSTEMS can populate this board to meet special OEM applications. Please contact an Applications Engineer with your requirements.

Technical Specifications

PART NUMBER	PCM-MIO-A-1	PCM-MIO-A-AD-1
ELECTRICAL	• PC/104 Bus: 16-bit, stackthrough • Voltage: +5V ±5% @ 500mA (typ.) All outputs unloaded	• PC/104 Bus: 16-bit, stackthrough • Voltage: +5V ±5% @ 500mA (typ.) All outputs unloaded
A/D SECTION	• Input: Up to 16 single-ended or 8 differential • Range: 0-5V, 0-10V, ±5V, and ±10V • Resolution: 16-bits • Input Impedance: – 42kohm (typ.) unipolar mode – 31kohm (typ.) bipolar mode	• Input: Up to 16 single-ended or 8 differential • Range: 0-5V, 0-10V, ±5V, and ±10V • Resolution: 16-bits • Input Impedance: – 42kohm (typ.) unipolar mode – 31kohm (typ.) bipolar mode
D/A SECTION	• Output: Eight channels • Range: 0-5V, 0-10V, ±2.5V, ±5V, ±10V, and -2.5V to 7.5V • Resolution: 12-bits, no missing codes • Settling Time: 2µS to 0.1% full scale step • Output Current: ±10mA per output typical with ±30mA max per board	N/A
DIGITAL I/O	• Type: 48-bits organized in six, 8-byte segments • Logic: TTL-compatible with 12mA sink for each pin	• Type: 48-bits organized in six, 8-byte segments • Logic: TTL-compatible with 12mA sink for each pin
ENVIRONMENTAL	• Operational from -40°C to +85°C • RoHS compliant	• Operational from -40°C to +85°C • RoHS compliant
MECHANICAL	• Dimensions: 3.6 x 3.8 inches (90 x 96mm) • Weight: 3.20 oz. (90.72 g)	• Dimensions: 3.6 x 3.8 inches (90 x 96mm) • Weight: 3.20 oz. (90.72 g)

Order Information

PART NUMBER	PCM-MIO-A-1	PCM-MIO-A-AD-1 *Minimum Order Quantity Required.*

Contact an Application Engineer or visit our website for more information.

PARHELIA
Parhelia B.V.
www.parheliabv.com
+31(0)10 741 00 28

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WINSYSTEMS, INC. | 2890 112th Street, Grand Prairie, Texas 75050 | 817-274-7553 | info@winsystems.com | www.winsystems.com