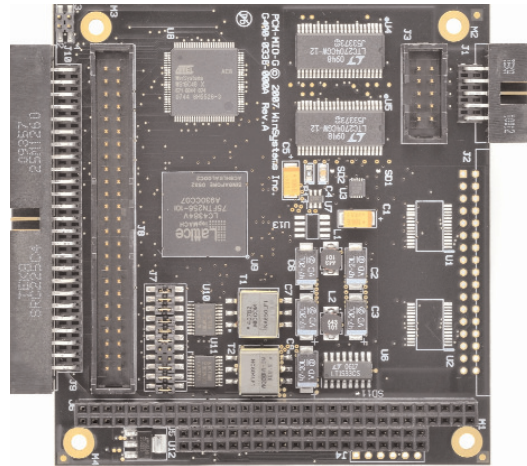


FEATURES

- PC/104 Analog Output and Digital I/O Module
- Eight, 12-bit Digital-to-Analog (D/A) converters
- Output Ranges: 0-5V, 0-10V, $\pm 5V$, $\pm 10V$
- Each channel independently software programmable
- Each output channel can be updated and cleared individually or simultaneously
- No adjustment potentiometers or calibration needed
- Special OEM configurations available for 16-bit DACs and other analog and digital I/O combinations.
- 48 bi-directional TTL-compatible digital I/O lines with 24 capable of event sense interrupt generation
- 12mA sink current per line
- Pinout compatible with industry-standard, optically isolated, digital I/O racks
- Software programmable interrupt configuration
- Standard 0.100" headers for easy cable access
- Free software drivers in C, Windows® XPe, and Linux
- Operating temperature: -40°C to $+85^{\circ}\text{C}$
- +5Vdc operation
- Small size: 90mm x 96mm (3.6" x 3.8")
- Low cost module



The PCM-MIO-G-DA-1 is a versatile PC/104 based, analog output and digital I/O board designed to meet customer demands for high channel count D/A and digital I/O. The board is based upon precision D/A converters and voltage references which require no external calibration. The digital I/O provided uses WinSystems' versatile WS16C48 that is used on many of our SBCs and other I/O products.

The PCM-MIO-G-DA-1 operates over the industrial temperature range of -40° to $+85^{\circ}\text{C}$. This board is pinout compatible with other WinSystems' PC/104 analog conversion modules.

FUNCTIONAL CAPABILITY

Analog Output - The PCM-MIO-G-DA-1 uses two Linear Technologies SoftSpan™ quad Digital-to-Analog converters (DACs). These eight independent, 12-bit D/A channels have four programmable output voltage ranges of 0-5V, 0-10V, $\pm 5V$, and $\pm 10V$. They are software programmable for either unipolar or bipolar mode plus specific voltage range on a per channel basis. INL and DNL are accurate to 1 LSB over the industrial temperature range in both unipolar and bipolar modes.

The device includes an internal deglitcher circuit that reduces the glitch impulse to less than 2nV/s (typical).

Each channel is asynchronously cleared to 0V for all ranges when reset.

Onboard DC/DC Power Supplies - There is an ultra low noise, $\pm 15V$ -power supply on board. It is designed to reduce both conducted and radiated EMI. This is achieved by independent control of voltage and slew rates for both the positive and negative voltages plus careful layout techniques. A separate regulator is used to generate an analog +5V supply for the converters. This is done to minimize digital switching noise since converters inherently have low power supply rejection (PSRR). The result is less than $300\mu\text{V}$ p-p (typical) from DC to 1MHz on all analog supply voltages.

Calibration - No calibration is required since the converters are laser trimmed at the factory.

Digital Input/Output - The PCM-MIO-G-DA-1 uses WinSystems' highly versatile WS16C48, 48-line digital I/O controller. There are 48 bits of TTL-compatible

digital I/O divided into two, 8-bit x 3 ports. Each I/O line is individually programmable for input, output, or output with read-back 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 to a single card for high density digital I/O support.

A key feature of the WS16C48 controller is its ability to monitor all twenty four 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 by the event so that even short duration pulses will be recognized.

I/O Connectors - The analog output channels are connected to two, 10-pin headers with a pin spacing of 0.100-inches. The WS16C48 digital I/O controller has its I/O lines connected to two, 50-pin connectors. A +5 volt source can be jumper enabled on pin 49 of each connector to supply logic power for the I/O module racks or other interface electronics. The pinout is compatible with the industry standard 4 to 24 position I/O module mounting racks for use with high-level AC and DC opto-isolated solid-state relays.

PC/104 Interface - The PCM-MIO is I/O mapped. The analog converters and digital I/O controller require 32 sequential port addresses. The addresses are jumper selectable from 0 to 3FF hex on any even 32-port boundary. The control, data, and power signals are wired to a 16-bit stackthrough PC/104 connector.

Interrupts - Each interrupt source can be selected and enabled or disabled by the user under software control. This increases flexibility and reduces the need for on board jumpers. IRQ line assignment to the PC/104 Bus is on channels 2, 3, 4, 5, 6, 7, 10, 11, 12, 14, and 15.

Special Configurations - WinSystems can change the functionality and number of analog input or output channels on this board to meet OEM configurations. Please contact an applications engineer with your requirements.

Software - Software drivers are available in C, Windows®XP, and Linux and can be downloaded free of charge from WinSystems' website.

SPECIFICATIONS

Electrical

PC/104 Bus: 16-bit, stackthrough
Voltage: +5V ±5% @ 490mA (All outputs unloaded)

Analog Output

Outputs: Eight channels
Range: 0-5V, 0-10V, ±5V, ±10V
Resolution: 12-bits, no missing codes
Settling time: 2µs to 0.1% full scale step
Output current: 10mA per output (typical) with 30mA maximum per board

Digital I/O

Type: 48 bits organized in six, 8-byte segments
Logic: TTL-compatible with 12mA sink

Mechanical

Dimensions: 3.6" x 3.8" (90mm x 96mm)
Weight: 3.02 oz. (85.73 gm.)

Connectors

D/A: Two, 10-pin on 0.100" grid
Digital I/O: Two, 50-pin on 0.100" grid
PC/104: 64-pin, 0.100" (32-pin double row)
40-pin, 0.100" (20-pin double row)
Jumpers: 0.020" square posts on 2mm centers

Environmental

Operating Temperature: -40° to +85° Celsius
Non-condensing relative humidity: 5% to 95%

ORDERING INFORMATION

PCM-MIO-G-DA-1 PC/104 Octal D/A and 48-line digital I/O board

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