



- 1-MHz, 16-Bit Multifunction USB Module
- Synchronous Analog Input
- 3 Single-Ended Analog Inputs

General Specifications

Housing:

Material: Case: Delrin (POM), Lid: Anodized Aluminium

Dimensions: 278 W x 128 D x 38 mm H (10.6 x 3.6 x 1.6")

Weight: 0.943kg (2.079 lb)

Color: black

External connections:

USB: type B female

Power: Amphenol PT02A8-3P

Analog Input 1: Amphenol PT02A10-6S (2 single-ended inputs, trigger)

Analog Input 2: 4 x BNC female (single-ended)

Power supply: Input 110-240V~ 50/60Hz, Output 9V/1.67A

Environment:

Operating Temperature: -30 to 70°C (-54 to 158°F)

Storage Temperature: -40 to 80°C (-40 to 176°F)

Relative Humidity: 0 to 95% non-condensing

Communications: USB 2.0 high-speed mode (480 Mbps), if available, otherwise USB1.1 full-speed mode (12 Mbps)

Acquisition Data Buffer: 1 MSample

Vibration: MIL STD 810E category 1 and 10

External Power:

Power Range: 6 to 16 Vdc (used when USB port supplies insufficient power, or when an independent power supply is desired)

Power consumption: 2500 mW typical. The power consumption listed is for a single device, or for a single device connected to an expansion module. An optional power adapter will be required if the USB port cannot supply adequate power. USB2 ports are by USB2 standards, required to supply 2500 mW (nominal at 5V, 500 mA).

Over Voltage: 20V for 10 seconds, maximum

Analog Inputs

Over-Voltage Protection: ± 30 V without damage

Voltage Measurement Speed: 1 μ s per channel

Ranges: Software or sequencer selectable on a per-channel basis, ± 10 V, ± 5 V, ± 2 V, ± 1 V, ± 0.5 V, ± 0.2 V, ± 0.1 V

Input Impedance: 10M Ω single-ended

Total Harmonic Distortion: -80 dB typical for ± 10 V range, 1 kHz fundamental

Signal-to-Noise and Distortion: 72 dB typ for ± 10 V range, 1 kHz fundamental

Bias Current: 40 pA typical (0 to 35°C)

Crosstalk: -75 dB typical DC to 60 Hz; -65 dB typical @10 kHz

Common Mode Rejection: -70 dB typical DC to 1 kHz

Accuracy, Temperature Coefficient, and Noise			
Voltage Range¹⁾	Accuracy ± (% of reading + % Range) 23°C ±10°C, 1 year	Temperature Coefficient ± /°C (ppm of reading + ppm Range) -30°C to 13°C and 33°C to 70°C	Noise²⁾ (cts RMS)
-10 to 10V	0.031% + 0.008%	14 + 8	2.0
-5 to 5V	0.031% + 0.009%	14 + 9	3.0
-2 to 2V	0.031% + 0.010%	14 + 10	2.0
-1 to 1V	0.031% + 0.02%	14 + 12	3.5
-500 mV to 500 mV	0.031% + 0.04%	14 + 18	5.5
-200 mV to 200 mV	0.036% + 0.05%	14 + 12	8.0
-100 mV to 100 mV	0.042% + 0.10%	14 + 18	14.0

Notes:

1. Specifications assume differential input single channel scan, 1-MHz scan rate, unfiltered, CMV=0.0V, 30 minutes warm-up, exclusive of noise, range -FS to +FS
2. Noise reflects 10,000 samples at 1-MHz, typical, differential short

Maximum Usable Input Voltage	
Ranges	Maximum (Vin)
0.5, 1, 2, 5, 10V	10.5V
0.1, 0.2V	2.1V

A/D Specifications

Type: Successive approximation

Resolution: 16-bit

Maximum Sample Rate: 1 MHz

Nonlinearity (Integral): ±2 LSB maximum

Nonlinearity (Differential): ±1 LSB maximum

Input Sequencer

Analog, digital and frequency inputs can be scanned synchronously, based on either internal programmable timer or an external clock source. Analog and digital outputs can be synchronized to either of these clocks.

Triggering

Trigger Sources: Single-Channel Digital Trigger (external), a separate digital input is provided for digital triggering.