

Specifications

PMD-1608FS



**MEASUREMENT
COMPUTING™**

Specifications

Typical for 25°C unless otherwise specified.

Analog input section

Parameter	Conditions	Specification
A/D converter type		16-bit Successive Approximation type
Number of channels		8 single-ended
Input Configuration		Individual A/D per channel
Sampling method		Simultaneous
Absolute maximum input voltage	CHx IN to GND.	±15V max
Input Impedance		100 MOhm, min
Input ranges	Software selectable	±10V, ±5V, ±2V, ±1V,
Sampling rate	Scan to PC memory	0.6S/s to 50kS/s, software programmable
	Burst scan to 32k Sample FIFO	20S/s to 50kS/s, software programmable
Throughput	Software paced	500 S/s all channels
	Scan to PC memory (Note 1)	= (100kS/s) / (# of channels), max of 50kS/s for any channel
	Burst scan to 32k Sample FIFO	= (200kS/s) / (# of channels), max of 50kS/s for any channel
Resolution		16 bits
No missing codes		15 bits
Crosstalk	Signal DC-25KHz	-80 dB
CAL output	User calibration source	0.625V, 1.25V, 2.5V, 5.0V, software selectable
CAL output Accuracy (Note 2)		±0.5% typ, ±1.0% max
CAL current		±5mA max
Trigger Source	Software selectable	External Digital: TRIG_IN

Note 1: Maximum throughput scanning to PC memory is machine dependent. While the majority of XP equipped PC's we tested allowed acquisition at the maximum rates, a few would not. The lowest maximum rate we observed on an XP equipped PC during multi-channel testing was 95kS/s, aggregate. The rates specified are for Windows XP only. Maximum rates on operating systems that predate XP may be less and must be determined through testing on your machine.

Note 2: Actual values used for calibration are measured and stored in EEPROM.

Table 1. Calibrated Absolute Accuracy

Range	Accuracy (mV)
±10V	5.66
±5V	2.98
±2V	1.31
±1V	0.68

Table 2. Accuracy Components - All values are (±)

Range	% of Reading	Gain Error at FS (mV)	Offset (mV)
±10V	0.04	4.00	1.66
±5V	0.04	2.00	0.98
±2V	0.04	0.80	0.51
±1V	0.04	0.40	0.28

Table 3 below summarizes the noise performance for the PMD-1608FS. Noise distribution is determined by gathering 50K samples with inputs tied to ground at the user connector. Samples are gathered at the maximum specified sampling rate of 50kS/s.

Table 3. Noise Performance

Range	Typical Counts	LSB _{rms}
±10V	10	1.52
±5V	10	1.52
±2V	11	1.67
±1V	14	2.12

Digital input/output

Digital type	CMOS
Number of I/O	8 (DIO0 through DIO7)
Configuration	Independently configured for input or output
Pull up/pull-down configuration	All pins pulled up to V_s via 47K resistors (default). Positions available for pull down to ground. Hardware selectable via zero ohm resistors as a factory option.
Input high voltage	2.0V min, 5.5V absolute max
Input low voltage	0.8V max, -0.5V absolute min
Output high voltage (IOH = -2.5mA)	3.8V min
Output low voltage (IOL = 2.5mA)	0.7V max
Power on and Reset State	Input

External trigger

Parameter	Conditions	Specification
Trigger Source (Note 3)	External Digital	TRIG_IN
Trigger mode	Software selectable	Edge Sensitive: user configurable for CMOS compatible rising or falling edge.
Trigger latency		10 μ s max
Trigger pulse width		1 μ s min
Input high voltage		4.0V min, 5.5V absolute max
Input low voltage		1.0V max, -0.5V absolute min
Input leakage current		\pm 1.0 μ A

Note 3: TRIG_IN is a Schmitt trigger input protected with a 1.5K Ohm series resistor.

External clock input/output

Parameter	Conditions	Specification
Pin name		SYNC
Pin type		Bidirectional
Software selectable direction	Output	Outputs internal A/D pacer clock.
	Input	Receives A/D pacer clock from external source.
Input Clock Rate		50KHz, maximum
Clock pulse width	Input	1 μ s min
	Output	5 μ s min
Input leakage current		\pm 1.0 μ A
Input high voltage		4.0V min, 5.5V absolute max
Input low voltage		1.0V max, -0.5V absolute min
Output high voltage (Note 4)	IOH = -2.5mA	3.3V min
	No Load	3.8V min
Output low voltage (Note 4)	IOL = 2.5mA	1.1V max
	No Load	0.6V max

Note 4: SYNC is a Schmitt trigger input and is over-current protected with a 200 Ohm series resistor.

Counter section

Pin name (Note 5)	CTR
Counter type	Event counter
Number of Channels	1
Input source	CTR screw terminal
Resolution	32 bits
Schmidt Trigger Hysteresis	20mV to 100mV
Input Leakage Current	$\pm 1\mu\text{A}$
Maximum input frequency	1 MHz
High pulse width	500ns min
Low pulse width	500ns min
Input high voltage	4.0V min, 5.5V absolute max
Input low voltage	1.0V max, -0.5V absolute min

Note 5: CTR is a Schmitt trigger input protected with a 1.5K Ohm series resistor.

Memory

Data FIFO	32,768 samples, 65,536 bytes		
EEPROM	1,024 bytes		
EEPROM Configuration	Address Range	Access	Description
	0x000-0x07F	Reserved	128 bytes system data
	0x080-0x1FF	Read/Write	384 bytes cal data
	0x200-0x3FF	Read/Write	512 bytes user area

Microcontroller

Type	High performance 8-bit RISC microcontroller
Program Memory	16,384 words
Data Memory	2,048 bytes

Power

Parameter	Conditions	Specification
Supply Current	USB enumeration	< 100mA
Supply Current (Note 6)	Continuous Mode	150mA
+5V USB power available (Note 7)	<ul style="list-style-type: none"> ▪ Connected to Self-Powered Hub ▪ Connected to externally-powered Root Port Hub 	4.5V min, 5.25V max
Output Current (Note 8)		350mA max

Note 6: This is the total current requirement for the PMD-1608FS which includes up to 10mA for the status LED.

Note7: *Self-Powered Hub* refers to a USB hub with an external power supply. Self-powered hubs allow a connected USB device to draw up to 500mA. *Root Port Hubs* reside in the PC's USB Host Controller. The USB port(s) on your PC are root port hubs. All externally powered root port hubs (desktop PC's) provide up to 500mA of current for a USB device. Battery-powered root port hubs provide 100mA or 500mA, depending upon the manufacturer. A laptop PC that is not connected to an external power adapter is an example of a battery-powered root port hub. If your laptop PC is constrained to the 100mA maximum you will need to purchase a self-powered hub.

Note 8: This refers to the total amount of current that can be sourced from the USB +5V and digital outputs.

General

Device type	USB 2.0 (full-speed)
Device compatibility	USB 1.1, USB 2.0

Environmental

Operating Temperature Range	-40 to 85 °C
Storage Temperature Range	-40 to 85 °C
Humidity	0 to 90% non-condensing

Mechanical

Dimensions	79mm(L) x 82mm(W) x 25mm(H)
USB Cable Length	3 Meters max
User Connection Length	3 Meters max

Main connector and pin out

Connector type	Screw Terminal
Wire gauge range	16 AWG to 30 AWG

Pin	Signal Name	Pin	Signal Name
1	CH0 IN	21	DIO0
2	AGND	22	GND
3	CH1 IN	23	DIO1
4	AGND	24	GND
5	CH2 IN	25	DIO2
6	AGND	26	GND
7	CH3 IN	27	DIO3
8	AGND	28	GND
9	CH4 IN	29	DIO4
10	AGND	30	GND
11	CH5 IN	31	DIO5
12	AGND	32	GND
13	CH6 IN	33	DIO6
14	AGND	34	GND
15	CH7 IN	35	DIO7
16	AGND	36	SYNC
17	CAL	37	TRIG_IN
18	AGND	38	CTR
19	AGND	39	PC +5v
20	AGND	40	GND

**Measurement Computing Corporation
16 Commerce Boulevard
Middleboro, Massachusetts 02346**

(508) 946-5100

Fax: (508) 946-9500

**E-mail: info@mccdaq.com
www.mccdaq.com**