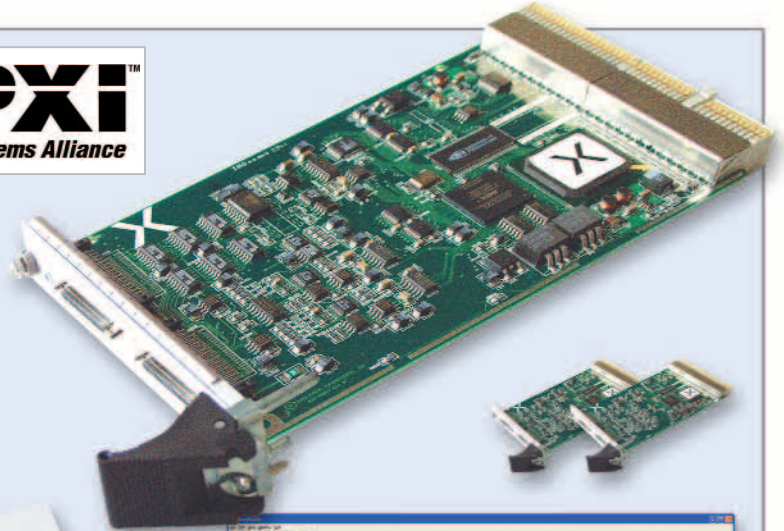


## XM Series Multifunction Analog I/O Boards for PXI

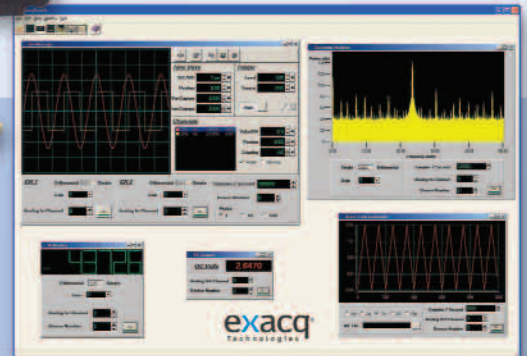
### Features

- 16/32 Single Ended Inputs (8/16 in Differential Mode)
- Up to 1 MS/s Maximum Sampling Rate
- 16 Bit A/D Resolution
- Up to 16 MB (8 MSample) Local Acquisition Memory
- 64K Channel-Gain List
- Flexible Triggering Modes
- Up to 2 Output Channels (Waveform Quality)
- Up to 1 MS/s D/A Converter per Channel
- 16 Bit D/A Resolution
- Up to 16 MB (8 MSample) Local Waveform Memory
- One Hz Sample Clock Resolution from onboard DDS
- 16/32 Digital I/O's (synchronous with analog I/O)
- Up to 3 Counter/Timers
- PCI Bus-Mastering Transfers
- Onboard 143 MHz, 32 Bit DSP for Real-Time Processing and Control
- Windows 98/Me/2000/XP



### SOFTWARE INCLUDED

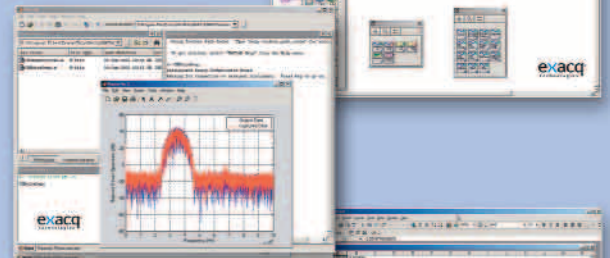
- Exacq Control Center™** – Easy to use configuration software for all Exacq Hardware.
- Exacq Bench™** – Extensive measurement tools, including oscilloscope, spectrum analyzer, waveform generator, DC voltage generator, logic analyzer, multimeter, strip chart recorder.
- Exacq SDK™** – A complete software developer's kit with a large library of sample code for LabVIEW, TestPoint, MATLAB, C++, Visual Basic and ActiveX.



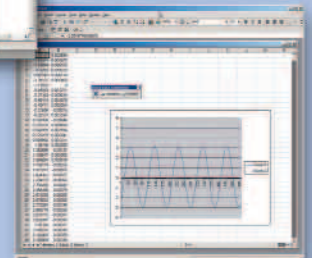
The Exacq Technologies XM Series of multifunction analog I/O boards for PXI was designed to provide high speed and 16-bit precision at a low price to meet challenging industrial instrumentation applications. All XM Series boards utilize an onboard processor, large local memory buffers, and PCI bus mastering to provide glitch-free capture and output of analog waveforms with nearly unlimited lengths. This performance is provided even under non-realtime Windows operating systems when running complex user applications, which are supported by a comprehensive Software Development Kit and sample code.

With up to 32 inputs sampled at up to 1 MHz and flexible triggering, the XM Series is ideal for high-speed automation and control applications. The onboard DSP coprocessor can offload critical real-time tasks, such as event-driven channel sequence changes or sensor input linearization (through look up tables or computation), to free the host program for higher-level algorithms and applications. The outputs are waveform quality with both waveform playback capability and function generation, or they can be slaved to the input channel sequence. The board is Plug-and-Play and autocalibrating, so there are no jumpers or potentiometers to manually adjust.

- ▲ **Exacq Bench:** A complete software measurement suite.
- ▶ **Exacq LabVIEW driver** provides a LabVIEW interface for all Exacq API calls.



- ▲ **Exacq MATLAB driver:** Full access to Exacq API calls in MATLAB through MEX-files.
- ▶ **ExacqXL** is a Microsoft Excel add-in enabling data acquisition from within Excel using any Exacq product.



## Detailed Specifications

### ANALOG INPUTS

<b>Number of Inputs:</b>	Up to 32 SE/16 differential
<b>Impedance:</b>	10 MΩ
<b>Bias Current:</b>	< 1 nA
<b>Analog Bandwidth:</b>	500 kHz (3 dB)
<b>Full Scale Input Range:</b>	Software Selectable
	Normal gain:
	1.25, 2.5, 5, 10V unipolar
	±1.25, ±2.5, ±5, ±10V bipolar
	High gain:
	10mV, 100mV, 1V, 10V unipolar
	±10mV, ±100mV, ±1V, ±10V bipolar
	+/-10V
<b>Absolute Max:</b>	
<b>Overvoltage Protection:</b>	+/-40V
<b>Gain Accuracy:</b>	0.02% of Full Scale +/-5 LSB
<b>CMRR:</b>	80 dB (to 60 Hz)
<b>A/D Converter:</b>	
Resolution:	16 bits
DNL:	<1 LSB (no missing codes)
INL:	<3 LSB (typical)
SNR:	75 dB (50 kHz input, +/-1V range)
Max Samp Rate:	1 MHz (CM-22xx), 250 kHz (CM-21xx)
System Noise:	1 LSB RMS
<b>Clock Source:</b>	
Internal Clock:	1 Hz - 1 MHz (1 Hz resolution)
	Software Selectable
	Synchronous to output clk
External Clock:	Must be 4x sample rate 1 MΩ, 4 MHz max
<b>Triggering:</b>	
Source:	Any channel, S/W, Dig I/O
Levels:	256 Steps per range
Slope:	+ or -
Pattern:	Up to 32 bits Digital Pattern
<b>Memory:</b>	Up to 16 MB Local capture memory (shared with output memory)
<b>Channel Mode:</b>	64K Entry channel-gain list
	Max sample rate across multiple channels
<b>PCI Interface:</b>	32 bit, 33 MHz Bus Mastering (Continuous full speed capture to PC memory is supported)

### ANALOG OUTPUTS

<b>Number of Outputs:</b>	2 (voltage output)
<b>Impedance:</b>	<1Ω (under 10 kHz)
	<10Ω (under 100 kHz)
	<30Ω (under 1 MHz)

### ANALOG OUTPUTS (CONT'D)

<b>Analog Filters:</b>	None
<b>Resolution:</b>	16 Bits
<b>Full Scale Output Range:</b>	Software Selectable
	0-10V, ±10V
<b>Current Source/Sink:</b>	30 mA min.
<b>Protection:</b>	Short to ground
<b>Gain Accuracy:</b>	0.05% of Full Scale +/-5 LSB
<b>DNL:</b>	<1 LSB (monotonic)
<b>INL:</b>	<4 LSB (typical)
<b>Waveform Mode:</b>	
Internal Clock:	10 Hz - 1 MHz (1 Hz step)
	Independent from or synchronous to output clk
SNR:	75 dB (50 kHz output, +/-10V range)
Memory:	Up to 16 MB Local Memory (shared with capture memory)
<b>Channel Mode:</b>	
Settling Time:	100 nS (to 0.1%)
Memory:	64K Entry channel-gain list

### DIGITAL I/O

<b>Number of I/O:</b>	Up to 32 (four 8 bit ports). Each port selectable as input or output
<b>Input High:</b>	2.0V, 5V max
<b>Input Low:</b>	0.8V, 0V min
<b>Output High:</b>	2.4V min @ 24 mA
<b>Output Low:</b>	0.4V max @ 24 mA
<b>Power Up State:</b>	Input (High Impedance)
<b>Counter/Timers:</b>	
Number:	3 (24 bits) on CM-22xx, 2 (24 bits) on CM-21xx
Modes:	8254, modes 1, 2, 3, 5
Clk/Gate:	From connector pins or internal (software selectable)
Speed:	20 MHz Max

### PHYSICAL/ENVIRONMENTAL

<b>Dimensions:</b>	4 HP (single slot) 3U PXI (160 x 100 mm)
<b>Power Consumption:</b>	50 mA +5V
	30 mA +12V
	610 mW
<b>Operating Temperature:</b>	0°C to 55°C
<b>Storage Temperature:</b>	-20°C to 70°C
<b>Connectors:</b>	68 Pin VHDCI female (analog and digital I/O 0-15)
	68 Pin VHDCI female (analog and digital I/O 16-31, if applicable)



## < Ordering info >

#### **XM Series - 250 kHz (1x, 2x, 4x, 8x Gain)**

XM-2320	16 analog in, 16 digital I/O, 2 analog outputs, 250 kHz
XM-2310	16 analog in, 16 digital I/O, 0 analog outputs, 250 kHz
XM-2350	32 analog in, 32 digital I/O, 2 analog outputs, 250 kHz
XM-2340	32 analog in, 32 digital I/O, 0 analog outputs, 250 kHz

#### **XM Series - 250 kHz (High Gain: 1x,10x,100x,1000x Gain)**

XM-2321	16 analog in, 16 digital I/O, 2 analog outputs, 250 kHz
XM-2311	16 analog in, 16 digital I/O, 0 analog outputs, 250 kHz
XM-2351	32 analog in, 32 digital I/O, 2 analog outputs, 250 kHz
XM-2341	32 analog in, 32 digital I/O, 0 analog outputs, 250 kHz

#### **XM Series - 1 MHz (1x, 2x, 4x, 8x Gain)**

XM-2420	16 analog in, 16 digital I/O, 2 analog outputs, 1 MHz
XM-2410	16 analog in, 16 digital I/O, 0 analog outputs, 1 MHz
XM-2450	32 analog in, 32 digital I/O, 2 analog outputs, 1 MHz
XM-2440	32 analog in, 32 digital I/O, 0 analog outputs, 1 MHz

#### **XM Series - 1 MHz (High Gain: 1x,10x,100x,1000x Gain)**

XM-2421	16 analog in, 16 digital I/O, 2 analog outputs, 1 MHz
XM-2411	16 analog in, 16 digital I/O, 0 analog outputs, 1 MHz
XM-2451	32 analog in, 32 digital I/O, 2 analog outputs, 1 MHz
XM-2441	32 analog in, 32 digital I/O, 0 analog outputs, 1 MHz