# *XH Series High Speed Data Acquisition Boards for PXI*

## Features

- **2 Input Channels**
- **Separate 20 MS/s A/D Converter per Channel**
- **Up to 40 MS/s in single channel mode**
- **12 Bit A/D Resolution**
- **Up to 16 MB Local Acquisition Memory (64MB optional)**
- **Analog, Digital, Software Triggering Modes**
- **1 Hz A/D Sample Clock Resolution from onboard DDS**
- **2 Output Channels with Arb/Function Generation Modes**
- **20 MS/s D/A Converter per Channel**
- **12 Bit D/A Resolution**
- **Analog Reconstruction Filtering**
- **Up to 16 MB Local Waveform Memory (64 MB optional)**
- **1 Hz D/A Sample Clock Resolution from onboard DDS**
- **16 Digital I/Os (Synchronous with Analog I/O)** *Optional*
- **2 Counter/Timers**
- **PCI Bus-Mastering Transfers at >80 MB/s sustained**
- **Onboard 143 MHz, 32 Bit DSP for Numerical Coprocessing**
- **Windows 98/Me/2000/XP, Linux Compatibility**



## Description

The Acquitek XH Series of High Speed Data Acquisition Boards was designed to provide superior high-speed functionality and performance at a low price. All XH Series boards utilize 16 MB of onboard memory, a local processor, and PCI bus mastering to provide glitch-free capture and/or playback of analog signals of length limited only by host RAM size, even with a non-realtime PC operating system.

With dual inputs and dual outputs and excellent dynamic specifications, the XH Series boards are ideal for communications applications, such as IQ modulation and demodulation. With 12 Bit resolution, high-speed precision and flexible triggering options, they are ideal for high-speed control applications. The onboard DSP coprocessor can offload intensive preprocessing steps, such as FFTs, to free the host program for higher-level algorithms and applications. The outputs are full-featured arbitrary waveform generators with both waveform playback capability and function generation mode, and analog reconstruction filters on board. The board is PCI Plug-and-Play, and digitally calibrated, so there are no jumpers or potentiometers to manually adjust.
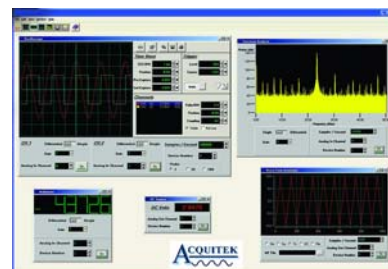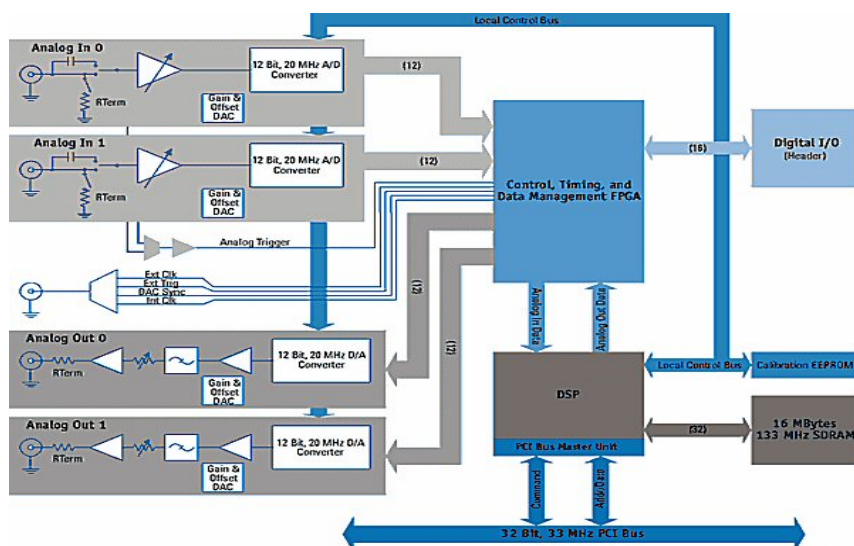


## Software included

**Acquitek Control Center –** Easy to use configuration software for all Acquitek Hardware.
**Acquitek Bench –** Extensive Measurement tools, including scilloscope, spectrum analyzer, waveform generator, DC voltage generator, logic analyzer, multimeter, strip chart recorder.
**Acquitek SDK –** A complete software developer's kit with a large library of sample code for LabVIEW, MATLAB, C++, Visual Basic, DASYLab, Excel, VEE Pro, Tespoint, ActiveX and Linux

We recommend AcquiFlex Software (not included)

## Specification

### ANALOG

| | |
|---|---|
| **Number of Inputs:** | 2 (synchronous) |
| **Impedance:** | 1 MΩ or 50Ω (75Ω available) Software Selectable |
| **Coupling:** | AC or DC Software Selectable |
| **Analog Bandwidth:** | 70 MHz (3 dB) |
| **Resolution:** | 12 Bits |
| **Full Scale Input Range:** | ±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V Software Selectable |
| **Absolute Max:** | ±12V |
| **Gain Accuracy:** | +/- 0.1 dB relative to full scale (at 100 kHz) |
| **Zero Accuracy:** | 0.1% of range +/- 1mV (at DC) |
| **DNL:** | < 1 LSB (monotonic) |
| **INL:** | < 4 LSB |
| **SNR:** | 64 dB (500 kHz input, 1 Vpp range) |
| **SFDR:** | 60 dB (1 Vpp range) |
| **Triggering:** | |
| Source: | Ch1, Ch2, Ext, S/W, Dig I/O |
| Levels: | ±2.5V, 256 Steps |
| Slope: | + or − |
| External: | ±2.5V, 100 kΩ Zin, 25 ns min Pulse width |
| **Sample Rate:** | |
| Internal Clock: | 10 kHz – 20 MHz (1 Hz resolution) dual channel Up to 40 MHz single channel Software Selectable Independent from output clk |
| External Clock: | Must be >= 4x sample rate 100 kΩ Zin, 80 MHz max |
| **Memory:** | Up to 16 MB local capture memory (shared with output memory). 64MB optional. |
| **PCI Interface:** | 32 Bit, 33 MHz Bus Mastering (Continuous full speed capture of 2 chan at 20MSps per chan (80 MB/s) to PC memory is supported) |

### ANALOG OUTPUTS

| | |
|---|---|
| **Number of Outputs:** | 2 (synchronous) |
| **Impedance:** | 50Ω (75Ω available) |
| **Coupling:** | DC |
| **Analog Filters:** | 7th Order Butterworth, 8 MHz 3dB Frequency |
| **Resolution:** | 12 Bits |
| **Full Scale Output:** | ±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V (into 50Ω load) Software Selectable |
| **Gain Accuracy:** | +/- 0.1 dB relative to full scale (at 100 kHz) |
| **Zero Accuracy:** | 0.1% of range +/- 1 mV (at DC) |
| **DNL:** | < 1 LSB (monotonic) |
| **INL:** | 1 LSB |

### ANALOG OUTPUTS ( CONT'D)

| | |
|---|---|
| **SNR:** | 72 dB (500 kHz output, 1 Vpp range) |
| **SFDR:** | 55 dB (1 Vpp range) |
| **Triggering:** | |
| Source: | Ch1, Ch2, Ext, S/W, Dig I/O |
| Ext Level: | ±2.5V, 256 Steps |
| Ext Slope: | + or − |
| Ext Input: | ±2.5V, 100 k Zin, 25 ns min Pulse width |
| **Sample Rate:** | |
| Internal Clock: | 1 Hz – 20 MHz (1 Hz resolution) dual channel Up to 40 MHz single channel Software Selectable Independent from input clk |
| External Clock: | Must be >= 4x sample rate 100 kΩ Zin 0, 80 MHz max |
| **Memory:** | up to 16 MB local waveform memory. 64 MB optional. |
| **Operating Modes:** | Arbitrary Waveform with Automatic looping Function (sine, square, triangle) |
| **Sync Output:** | Software enabled |

### DIGITAL I/O

| | |
|---|---|
| **Number of I/O:** | 16 (two 8 Bit ports). Each port selectable as input or output |
| **Input High:** | 2.0V, 5V max |
| **Input Low:** | 0.8V, 0V min |
| **Output High:** | 2.4V min @ 24 mA |
| **Output Low:** | 0.4V max @ 24 mA |
| **Power Up State:** | Input (High Impedance) |
| **Counter/Timers:** | |
| Number: | 2 (24 Bit) |
| Clock: | Internal from A/D or D/A clk |
| Speed: | 80 MHz Max |
| Modes: | 8254 modes 1, 2, 3, 5 |

### PHYSICAL/ENVIRONMENTAL

| | |
|---|---|
| **Dimensions:** | 4 HP (single-slot) 3U PXI (160 x 100 mm) 8 HP (two slot) with optional Digital I/O Module |
| **Power Consumption:** | 1.75 A +5 V 500 mA +12 V |
| **Operating Temperature:** | 0°C to 55°C |
| **Storage Temperature:** | -20°C to 70°C |
| **Connectors:** | 5 BNC Female (2 Input, 2 Output, 1 Ext trig/clk/sync out) DB-37 female connector (for optional digital I/O) |

CE

### Ordering info

**XH Series High Speed Data Acquisition Boards**
XH-3250   2 analog inputs, 2 analog outputs, 50 Ohms
XH-3240   2 analog inputs, 0 analog outputs, 50 Ohms
XH-3230   0 analog inputs, 2 analog outputs, 50 Ohms

XH-3251 2 analog inputs, 2 analog outputs, 75 Ohms
XH-3241 2 analog inputs, 0 analog outputs, 75 Ohms
XH-3231 0 analog inputs, 2 analog outputs, 75 Ohms

M-5110      64 MB memory option upgrade for all XH-Series

**XH Series High Speed Data Acquisition Boards with Digital I/O**
XH-3350   2 analog inputs, 2 analog outputs, 50 Ohms
XH-3340   2 analog inputs, 0 analog outputs, 50 Ohms
XH-3330   0 analog inputs, 2 analog outputs, 50 Ohms

XH-3351 2 analog inputs, 2 analog outputs, 75 Ohms
XH-3341 2 analog inputs, 0 analog outputs, 75 Ohms
XH-3331 0 analog inputs, 2 analog outputs, 75 Ohms