

Datenblatt - X Series Multifunction Data Acquisition



Overview

NI X Series devices for PCI Express and PXI Express are the most advanced data acquisition devices ever designed by National Instruments. They feature significant improvements in onboard timing and triggering and optimizations for use with multicore PCs. X Series devices integrate high-performance analog, digital, and counter/timer functionality onto a single device, making them well-suited for a broad range of applications, from basic data logging to control and test automation.

Requirements and Compatibility

OS Information

Windows Vista x64/x86
PharLap
Real-Time OS
Windows XP

Driver Information

NI-DAQmx

Software Compatibility

ANSI C/C++
LabVIEW
LabVIEW Real-Time
Module
LabVIEW SignalExpress
Visual Studio .NET
Measurement Studio
Visual Basic
LabWindows/CVI

Irrtum und Änderungen vorbehalten.

**AMC – Analytik & Messtechnik GmbH, Heinrich-Lorenz-Str. 55, D-09120
Chemnitz**

Tel. 0371 / 38388-0 Fax 0371 / 38388-99

e-Mail: info@amc-systeme.de

Internet: <http://www.amc-systeme.de>

Ihr Systemhaus für PC-gestützte Mess-, Steuer- und Automatisierungstechnik!

Comparison Tables

Bus	Model Number	Analog Inputs (AI)	Max AI Sampling Rate (1-channel)	Max Total AI Throughput	Analog Outputs (AO)	Max AO Update Rate	Digital I/O Lines	Max Digital I/O Rate	Triggering
PCI Express	6320	16	250 kS/s	250 kS/s	0	-	24	1 MHz	Digital
PCI Express	6321	16	250 kS/s	250 kS/s	2	900 kS/s	24	1 MHz	Digital
PCI Express	6323	32	250 kS/s	250 kS/s	4	900 kS/s	48	1 MHz	Digital
PCI Express, PXI Express	6341	16	500 kS/s	500 kS/s	2	900 kS/s	24	1 MHz	Digital
PCI Express	6343	32	500 kS/s	500 kS/s	4	900 kS/s	48	1 MHz	Digital
PCI Express	6351	16	1.25 MS/s	1 MS/s	2	2.86 MS/s	24	10 MHz	Analog, Digital
PCI Express	6353	32	1.25 MS/s	1 MS/s	4	2.86 MS/s	48	10 MHz	Analog, Digital
PCI Express, PXI Express	6361	16	2 MS/s	1 MS/s	2	2.86 MS/s	24	10 MHz	Analog, Digital
PCI Express, PXI Express	6363	32	2 MS/s	1 MS/s	4	2.86 MS/s	48	10 MHz	Analog, Digital
PXI	6356	8	1.25	10 MS/s	2	3.33	24	10 MHz	Analog,

Irrtum und Änderungen vorbehalten.

AMC – Analytik & Messtechnik GmbH, Heinrich-Lorenz-Str. 55, D-09120 Chemnitz

Tel. 0371 / 38388-0 Fax 0371 / 38388-99

e-Mail: info@amc-systeme.de

Internet: <http://www.amc-systeme.de>

Ihr Systemhaus für PC-gestützte Mess-, Steuer- und Automatisierungstechnik!



Bus	Model Number	Analog Inputs (AI)	Max AI Sampling Rate (1-channel)	Max Total AI Throughput	Analog Outputs (AO)	Max AO Update Rate	Digital I/O Lines	Max Digital I/O Rate	Triggering
Express		simultaneous	MS/s/channel			MS/s			Digital
PXI Express	6358	16 simultaneous	1.25 MS/s/channel	20 MS/s	4	3.33 MS/s	48	10 MHz	Analog, Digital
PXI Express	6366	8 simultaneous	2 MS/s/channel	16 MS/s	2	3.33 MS/s	24	10 MHz	Analog, Digital
PXI Express	6368	16 simultaneous	2 MS/s/channel	32 MS/s	4	3.33 MS/s	48	10 MHz	Analog, Digital

Application and Technology

NI-STC3 Timing and Synchronization Technology

NI X Series multifunction data acquisition (DAQ) devices include the NI-STC3, an ASIC designed by NI for advanced timing, triggering, and synchronization. This technology includes the following:

- + Four counter/timers with more functionality than ever before, such as the ability to create a finite pulse train with a single counter
- + A 100 MHz timebase for faster triggering response and more precise generation of analog and digital sample clocks
- + Independent analog and digital timing engines
- + Retriggerable measurement tasks for analog I/O, digital I/O, and counter/timers

Native PCI Express Interface

In contrast to a PCI-to-PCI Express bridge chip, which limits the bandwidth of the device to that of the PCI bus and introduces latency, X Series devices use a native x1 PCI Express interface that provides up to 250 MB/s in each direction. National Instruments has also optimized this interface for low latency in single-point control applications. You can use X Series PCI Express boards in any PCI Express slot from x1 up to x16.

Irrtum und Änderungen vorbehalten.

AMC – Analytik & Messtechnik GmbH, Heinrich-Lorenz-Str. 55, D-09120 Chemnitz

Tel. 0371 / 38388-0 Fax 0371 / 38388-99

e-Mail: info@amc-systeme.de

Internet: <http://www.amc-systeme.de>

Ihr Systemhaus für PC-gestützte Mess-, Steuer- und Automatisierungstechnik!



Software Enhancements

X Series devices are compatible with NI-DAQmx Version 9.0 or later driver software. More than a basic driver, NI-DAQmx includes the NI Measurement & Automation Explorer (MAX) configuration utility, the DAQ Assistant for rapid development of basic applications, and hundreds of example programs for NI LabVIEW and text-based languages. NI-DAQmx also includes LabVIEW SignalExpress LE basic data-logging software.

NI-DAQmx 9.0 introduces the ability to synchronize multiple X Series devices with a single NI-DAQmx task, which previously took several tasks and manual routing of clocks and triggers. This version also introduces the fastest, easiest way to acquire measurement data to disk in the Technical Data Management Streaming (TDMS) format with the new Configure Logging VI.

With NI-DAQmx and intuitive LabVIEW graphical programming, you can easily develop applications that take advantage of today's multicore systems so you can perform acquisition, signal processing, and data logging on different CPU cores.

Simultaneous Sampling X Series

Because of the added bandwidth provided by PCI Express, the X Series offers simultaneous sampling options using the same channel counts and connectivity as multiplexed devices. The higher bandwidth of the PCI Express bus also alleviates the need to have several megabytes of onboard memory for simultaneous sampling devices.

Unlike multiplexed devices that reduce sampling rates as you add more channels, you can use simultaneous sampling devices to maintain sampling rates as you expand the number of channels. Simultaneous sampling X Series devices are available with up to 16 differential channels per device and with PXI Express, you can sample more than 200 channels simultaneously.

Applications

Acquisition and Visualization

X Series devices include analog, digital, and counter circuitry for the most common types of static and waveform measurements. With LabVIEW, you can easily acquire the data and view it on a variety of graphs and displays. You can use configuration-based wizards called Express VIs to take measurements and perform signal processing with minimal programming.

Irrtum und Änderungen vorbehalten.

**AMC – Analytik & Messtechnik GmbH, Heinrich-Lorenz-Str. 55, D-09120
Chemnitz**

Tel. 0371 / 38388-0 Fax 0371 / 38388-99

e-Mail: info@amc-systeme.de

Internet: <http://www.amc-systeme.de>

Ihr Systemhaus für PC-gestützte Mess-, Steuer- und Automatisierungstechnik!



Data Logging

Whether you are validating a new hardware design, monitoring conditions on a factory floor, or recording temperature changes during a scientific experiment, you need to take measurements, visualize your data, and often log it to disk. With X Series multifunction DAQ, you can develop a user-defined measurement system by using intuitive graphical programming software and incorporating the exact visualization, analysis, and data-logging capabilities your application requires.

Control Systems

If you need to control the temperature of a room, the speed of a motor, or the pressure of hydraulic fluids, you can use X Series DAQ hardware to connect sensors and actuators to your computer and build the control system that meets your exact application needs. The low-latency PCI Express bus improves single-point I/O performance, and with LabVIEW software and NI-DAQmx driver software, you can easily take sensor measurements, compare values to a setpoint, and update output signals. X Series devices also have four counter/timers for performing quadrature encoder measurements, pulse-width modulation, pulse train generation, frequency measurements, and much more, making them ideal for basic motor control.

Test Automation

X Series DAQ hardware provides analog inputs, analog outputs, hardware-timed digital I/O, and four counter/timers on a single device, making it a cost-effective option for basic device under test characterization and test automation. With NI-DAQmx software, you can easily synchronize acquisition or generation on multiple subsystems, such as an analog input and analog output channel. In addition, you can easily synchronize two or more X Series devices for further expansion by using a RTSI cable for PCI Express devices or over the PXI Express backplane for PXI Express modules.

Compatible Accessories

All X Series devices use either a single or dual-stack 68-pin VHDCI female connector, depending on the number of analog and digital channels on the device. National Instruments offers several options for cables, from 0.5 to 10 m and from low-cost to high-performance with shielding. Connector blocks are available with screw terminal, BNC, or custom connector types.

For measurements requiring signal conditioning, you can use X Series with SCXI signal conditioning modules.

Upgrading

Because X Series devices use the same VHDCI connector and NI-DAQmx driver software as NI M Series devices, upgrading is easy. You can reuse your code and preserve your investment in accessories. The pinouts for X Series devices are backward-compatible with M Series devices.

Irrtum und Änderungen vorbehalten.

**AMC – Analytik & Messtechnik GmbH, Heinrich-Lorenz-Str. 55, D-09120
Chemnitz**

Tel. 0371 / 38388-0 Fax 0371 / 38388-99

e-Mail: info@amc-systeme.de

Internet: <http://www.amc-systeme.de>

Ihr Systemhaus für PC-gestützte Mess-, Steuer- und Automatisierungstechnik!