High-Performance M Series Multifunction DAQ for USB – 16-Bit, up to 1.25 MS/s, up to 32 Analog Inputs

NI USB-6251, NI USB-6259 *NEW!*

- Up to 32 analog inputs at 16 bits, 1.25 MS/s (1 MS/s scanning)
- Up to 4 analog outputs at 16 bits, 2.8 MS/s (2 µs full-scale settling)
- Up to 48 TTL/CMOS digital I/O lines (up to 32 hardware-timed at up to 1 MHz)
- Two 32-bit, 80 MHz counter/timers
- Analog and digital triggering
- NI-PGIA 2 and NI-MCal calibration technology for improved measurement accuracy
- 4 high-speed signal streams
- Power supply included
- 3-year warranty
- Available lifetime warranty and calibration services

Operating Systems
- Windows 2000/XP

Recommended Software
- LabVIEW
- LabWindows/CVI
- Measurement Studio

Other Compatible Software
- SignalExpress
- VI Logger
- Visual Studio .NET
- C/C++/C#

Measurement Services Software (included)
- NI-DAQmx driver software (8.2 or later)
- Measurement & Automation Explorer configuration utility
- VI Logger Lite data-logging software

Family	Bus	Analog Inputs	Resolution (bits)	Max Rate (S/s)	Analog Outputs	Analog Output Resolution (bits)	Max Rate (S/s)	Range (V)	Digital I/O	Clocked[1] DIO	Counter	Resolution (bits)
NI 6251	USB	16	16	1.25 M	2	16	2.8 M	±10	24	8, up to 1 MHz[1]	2	32
NI 6259	USB	32	16	1.25 M	4	16	2.8 M	±10	48	32, up to 1 MHz[1]	2	32
NI 6221	USB	16	16	250 k	2	16	833 k	±10	24	8, up to 1 MHz[1]	2	32
NI 6229	USB	32	16	250 k	4	16	833 k	±10	48	32, up to 1 MHz[1]	2	32

[1]Correlated DIO can be clocked at up to 1 MHz across the USB bus and up to 10 MHz using onboard regeneration.

Table 1. High-Speed M Series for USB Selection Guide

Overview and Applications

With recent speed and bandwidth improvements, USB has evolved into a core bus of choice for measurement and automation applications. USB adds portability and ease of use with plug-and-play compatibility. With the National Instruments M Series for USB, you can deliver a high-performance portable system using an available USB port on a laptop computer and other portable computing platforms. NI designed a new and innovative patent-pending signal streaming technology with which you can sustain four high-performance streams of data over USB. This new technology greatly improves overall USB data acquisition performance by providing high-speed data paths for USB control and data transfer. The NI M Series modules for USB also come with built-in screw terminals for direct signal connectivity, eliminating the need for external cabling and connector blocks.

USB M Series high-performance multifunction data acquisition (DAQ) modules are optimized for superior accuracy at fast sampling rates. They have an onboard NI-PGIA 2 amplifier designed for fast settling times at high scanning rates, ensuring 16-bit accuracy even when measuring all channels at maximum speeds. All high-performance devices have a minimum of 16 analog inputs, 24 digital I/O lines, seven programmable input ranges, analog and digital triggering, and two counter/timers. All high-performance USB M Series devices have a two-year calibration interval. USB M Series devices, available with lifetime warranties and additional calibration services, are ideal for test, control, and design applications including:

- Portable data logging – log environmental or voltage data quickly and easily
- Field-monitoring applications
- Embedded OEM applications
- In-vehicle data acquisition
- Academic lab use – academic discounts available

USB M Series for Test, Control, and Design

USB M Series digital lines can drive 24 mA for relay and actuator control. By clocking the digital lines as fast as 10 MHz, you can use these lines for pulse-width modulation (PWM) to control valves, motors, fans, lamps, and pumps. With four waveform analog outputs, two 80 MHz counter/timers, and four USB signal streams, high-performance M Series devices also have encoder measurement capabilities,

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protected digital lines, and digital debounce filters for control applications. With up to 32 analog inputs, 32 clocked digital lines, and four analog outputs, you can execute multiple control loops with a single device.

For design applications, you can use the wide range of I/O – from 32 analog inputs to 48 digital lines – to measure and verify prototype designs. USB M Series devices and National Instruments SignalExpress interactive measurement software bring benchtop measurements to the PC. With NI SignalExpress interactive configuration-based steps, you can quickly create design verification tests. The fast acquisition and generation rates of high-performance USB M Series high-speed devices along with SignalExpress provide fast design analysis. You can convert your tested and verified SignalExpress projects to NI LabVIEW applications for immediate M Series DAQ use, and bridge the gap between test, control, and design applications.

Recommended Training and Services

All M Series devices are available with additional warranty and calibration services. Choose from the one-year extended warranty, lifetime warranty, or lifetime warranty with one basic calibration service. For new data acquisition programmers, NI recommends the "Data Acquisition: 7 Steps to Success" tutorial kit. This tutorial kit helps shorten development time for data acquisition applications by describing the various stages of getting started with data acquisition applications including system definition, setup, test, and application programming.

Recommended Software

National Instruments measurement services software, built around NI-DAQmx driver software, includes intuitive application programming interfaces, configuration tools, I/O assistants, and other tools designed to reduce system setup, configuration, and development time. National Instruments recommends using the latest version of NI-DAQmx driver software for application development in National Instruments LabVIEW, LabWindows/CVI, and Measurement Studio. To obtain the latest version of NI-DAQmx, visit **ni.com/support/daq/versions**. USB M Series devices are compatible with the following versions (or later) of NI application software – LabVIEW, LabWindows/CVI, or Measurement Studio versions 8.x; SignalExpress 1.x; and VI Logger 2.0. M Series devices are not compatible with the Traditional NI-DAQ (Legacy) driver.

Sensor/Signals (>10 V)		
System Description	**Cable**	**Carrier**
SCC Signal Conditioning	SH68-68-EP	SCC
Sensor/Signals (<10 V)		
System Description	**Cable**	**Terminal Block**
Screw Terminal (Shielded)[2]	SH68-68-EP	SCC-68[1]
BNC Connectivity	SH68-68-EP	BNC-2110
Screw Terminal (Nonshielded)[2]	R68-68	SCC-68[1]

[1] Includes SCC signal conditioning.
[2] Consider the integrated screw termination version of the USB DAQ device.

Table 2. Recommended Accessories

Recommended Accessories (Mass-Termination Versions)

Signal conditioning is required for sensor measurements or voltage inputs greater than 10 V. NI SCC products, which are designed to increase the performance and reliability of your DAQ system, are up to 10 times more accurate than using terminal blocks alone. Refer to Table 2 for more information, or vist **ni.com/sigcon**.

High-Performance M Series Multifunction DAQ for USB – 16-Bit, up to 1.25 MS/s, up to 32 Analog Inputs

Ordering Information

NI USB-6251
  Screw terminal ....779627-0P[1]
  Mass terminal..779694-0P[1]

NI USB-6259
  Screw terminal ....779628-0P[1]
  Mass terminal..779695-0P[1]

NI USB-6221
  Screw terminal ....779808-0P[1]

NI USB-6229
  Screw terminal ....779628-0P[1]

Includes NI-DAQmx software.

[1] P is 1 (U.S. 120 VAC); [2] (Switzerland 220 VAC); [3] (Australian 240 VAC);
[4] (Universal Euro 240 VAC); [6] (United Kingdom 240 VAC); [7] (Japanese 100 VAC)
Includes data acquisition driver software, 1 m USB cable, and AC adapter.

Board-Only Devices for OEM

NI USB-6251 OEM
  1 each...194929-03
  10 each...779761-01

NI USB-6259 OEM
  1 each...194929-03
  10 each...779762-01

NI USB-6221 OEM
  1 each...195959-02
  10 each...779809-01

NI USB-6229 OEM
  1 each...195959-01
  10 each...779811-01

Accessories

Cables
  SH68-68-EP (shielded) 184749-01
  R6868 (unshielded ribbon) 182482-01

Terminal Blocks and Signal Conditioning Carrier
  SCC-2345 carrier 777458-01
  SCC-68 screw-terminal block for mass termination 779475-01
  BNC-2110 BNC terminal block for mass termination 777643-01

Data Acquisition Services

Data Acquisition: 7 Steps to Success 779489-01
1-year extended warranty 960431-01
Lifetime limited warranty...................................960432-01
Lifetime limited warranty and 1 basic calibration...............960433-01

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to **ni.com/usb**.

Specifications

Safety and Compliance

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:

- IEC 61010-1, EN 61010-1
- UL 61010-1, CSA 61010-1

Note: For UL and other safety certifications, refer to the product label or visit **ni.com/certification**, search by model number or product line, and click the appropriate link in the Certification column.

Electromagnetic Compatibility

This product is designed to meet the requirements of the following standards of EMC for electrical equipment for measurement, control, and laboratory use:

- EN 61326 EMC requirements; Minimum Immunity
- EN 55011 Emissions; Group 1, Class A
- CE, C-Tick, ICES, and FCC Part 15 Emissions; Class A

Note: For EMC compliance, operate this device according to product documentation.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE marking, as follows:

- 73/23/EEC; Low-Voltage Directive (safety)
- 89/336/EEC; Electromagnetic Compatibility Directive (EMC)

Note: Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit **ni.com/certification**, search by model number or product line, and click the appropriate link in the Certification column.

Waste Electrical and Electronic Equipment (WEEE)

EU Customers: At the end of their life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers and National Instruments WEEE initiatives, visit **ni.com/environment/weee.htm**.

NI Services and Support

NI has the services and support to meet your needs around the globe and through the application life cycle – from planning and development through deployment and ongoing maintenance. We offer services and service levels to meet customer requirements in research, design, validation, and manufacturing. Visit **ni.com/services**.

Training and Certification

NI training is the fastest, most certain route to productivity with our products. NI training can shorten your learning curve, save development time, and reduce maintenance costs over the application life cycle. We schedule instructor-led courses in cities worldwide, or we can hold a course at your facility. We also offer a professional certification program that identifies individuals who have high levels of skill and knowledge on using NI products. Visit **ni.com/training**.

Professional Services

Our Professional Services Team is composed of NI applications engineers, NI Consulting Services, and a worldwide National Instruments Alliance Partner program of more than 600 independent consultants and integrators. Services range from start-up assistance to turnkey system integration. Visit **ni.com/alliance**.

OEM Support

We offer design-in consulting and product integration assistance if you want to use our products for OEM applications. For information about special pricing and services for OEM customers, visit **ni.com/oem**.

Local Sales and Technical Support

In offices worldwide, our staff is local to the country, giving you access to engineers who speak your language. NI delivers industry-leading technical support through online knowledge bases, our applications engineers, and access to 14,000 measurement and automation professionals within NI Developer Exchange forums. Find immediate answers to your questions at **ni.com/support**.

We also offer service programs that provide automatic upgrades to your application development environment and higher levels of technical support. Visit **ni.com/ssp**.

Hardware Services

NI Factory Installation Services

NI Factory Installation Services (FIS) is the fastest and easiest way to use your PXI or PXI/SCXI combination systems right out of the box. Trained NI technicians install the software and hardware and configure the system to your specifications. NI extends the standard warranty by one year on hardware components (controllers, chassis, modules) purchased with FIS. To use FIS, simply configure your system online with **ni.com/pxiadvisor**.

Calibration Services

NI recognizes the need to maintain properly calibrated devices for high-accuracy measurements. We provide manual calibration procedures, services to recalibrate your products, and automated calibration software specifically designed for use by metrology laboratories. Visit **ni.com/calibration**.

Repair and Extended Warranty

NI provides complete repair services for our products. Express repair and advance replacement services are also available. We offer extended warranties to help you meet project life-cycle requirements. Visit **ni.com/services**.

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