

# High-Speed M Series Multifunction DAQ 16-Bit, up to 1.25 MS/s, up to 32 Analog Inputs

## NI M Series – High-Speed

- NI recommends high-accuracy M Series for 5X more measurement sensitivity and lowpass filtering
- 16 or 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  $\mu$ s full-scale settling)
- 7 programmable input ranges ( $\pm 100$  mV to  $\pm 10$  V) per channel
- Up to 48 TTL/CMOS digital I/O lines (up to 32 hardware-timed at 10 MHz)
- Two 32-bit, 80 MHz counter/timers
- Analog and digital triggering
- NI-MCal calibration technology for improved measurement accuracy
- 6 DMA channels for high-speed data throughput
- 3-year warranty

### Operating Systems

- Windows 2000/NT/XP
- Mac OS X
- Linux

### Recommended Software

- LabVIEW
- LabWindows/CVI
- Measurement Studio

### Other Compatible Software

- SignalExpress
- VI Logger
- Visual Studio .NET
- C/C++

### Measurement Services Software (included)<sup>1</sup>

- NI-DAQmx driver software
- Measurement & Automation Explorer configuration utility
- VI Logger Lite data-logging software



<sup>1</sup>Mac OS X and Linux users must download NI-DAQmx Base driver.

Family	Bus	Analog Inputs	Analog Input Resolution (bits)	Analog Outputs	Output Resolution (bits)	Max Output Rate (MS/s)	Max Analog Output Range (V)	Digital I/O	Correlated (clocked) DIO
NI 6250	PCI, PXI	16	16	0	—	—	—	24	8, up to 10 MHz
NI 6251	PCI, PXI	16	16	2	16	2.8	$\pm 5$	24	8, up to 10 MHz
NI 6254	PCI, PXI	32	16	0	—	—	—	48	32, up to 10 MHz
NI 6259	PCI, PXI	32	16	4	16	2.8	$\pm \text{ext ref}$	48	32, up to 10 MHz

Table 1. High-Speed M Series Selection Guide

## Overview and Applications

National Instruments M Series high-speed multifunction data acquisition (DAQ) devices 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-speed 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-speed M Series devices have a three-year manufacturing warranty and an extended two-year calibration interval. M Series devices are ideal for applications including test, control, and design.

### M Series for Test

For test, you can use M Series high-speed analog inputs and 10 MHz digital lines in conjunction with NI signal conditioning for applications including electronics test, component characterization, and sensor measurements. High-speed M Series devices are compatible with National Instruments SCC and SCXI signal conditioning platforms, which provide amplification, filtering, and power for virtually every type of sensor. These platforms also are compliant with IEEE 1451.4 smart transducer electronic data

sheet (TEDS) sensors, which provide digital storage for sensor data sheet information. High-accuracy M Series devices are recommended for improved accuracy in test applications. Your tests can benefit from the high-accuracy M Series 18-bit ADC for a 4X increase in resolution and onboard lowpass filters for 5X more measurement sensitivity.

### M Series for Control

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 six DMA channels, M Series devices can execute multiple control loops simultaneously. High-speed M Series devices also have direct support for encoder measurements, 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 higher-count control loops, you can use M Series devices in conjunction and tightly synchronized with National Instruments analog output devices for 64 or more loops.

# High-Speed M Series Multifunction DAQ

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### M Series for Design

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. 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-speed M Series devices along with SignalExpress provide on-the-fly 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.

### Simultaneous and Intelligent Data Acquisition

When you need to obtain performance from a data acquisition device beyond the capabilities of a multifunction DAQ device, National Instruments provides simultaneous sampling with NI S Series and intelligent DAQ with NI R Series. The S Series architecture dedicates an ADC per channel to provide higher aggregate sampling rates compared to multiplexed devices. S Series devices are ideal for applications including IF digitization, transient recording, ultrasound and sonar testing, and high-energy physics.

The National Instruments multifunction R Series data acquisition devices contain a 1M/3M gate FPGA that is reconfigurable using the National Instruments LabVIEW FPGA Module. The multifunction R Series devices have up to eight independent 16-bit analog inputs with up to 200 kHz simultaneous sampling, up to eight independent 16-bit analog outputs with up to 1 MHz simultaneous update rates, and up to 96 digital I/O lines configurable at rates up to 40 MHz. You can customize these devices to develop capabilities such as complete control over the synchronization and timing of all signals and operations; user-defined onboard decision-making logic; and digital lines individually configurable as input, output, counter/timers, PWM, flexible encoder inputs, or user-defined communication protocols.

### Recommended Accessories

Signal conditioning is required for sensor measurements or voltage inputs greater than 10 V. NI SCXI is a versatile, high-performance signal conditioning platform optimized for high-channel-count applications. NI SCC provides portable, flexible signal conditioning options on a per-channel basis. Refer to [ni.com/sigcon](http://ni.com/sigcon) for resources on available NI signal conditioning. For applications that do not require signal conditioning, refer to Table 2 for recommended cabling and accessories.

### 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](http://ni.com/support/daq/versions). Linux and Mac OS X users can program M Series devices with NI-DAQmx Base driver software. M Series devices are compatible with the following versions (or later) of NI application software – LabVIEW, LabWindows/CVI, or Measurement Studio versions 7.x; SignalExpress 1.x; VI Logger 2.0; or LabVIEW with the LabVIEW Real-Time Module 7.1. M Series devices are not compatible with the Traditional NI-DAQ (Legacy) driver.

System Description	Cable	Terminal Block
High-performance	SHC-68-68-EPM	SCB-68, BNC-2110, BNC-2111,
Basic shielding	SHC68-68	BNC-2120, BNC-2090
Custom connectivity	SHC68-68M-EPM, SHC68-NT-S	CR-68LPR, TBX-68, CA-1000

Table 2. Recommended Accessories (Two cables and accessories are required to access all pins on the NI 6254 and NI 6259 devices.)

### Ordering Information

#### PCI

NI PCI-6250 .....	779069-01
NI PCI-6251 .....	779070-01
NI PCI-6254 .....	779071-01
NI PCI-6259 .....	779072-01

#### PXI

NI PXI-6250 .....	779116-01
NI PXI-6251 .....	779117-01
NI PXI-6254 .....	779118-01
NI PXI-6259 .....	779119-01

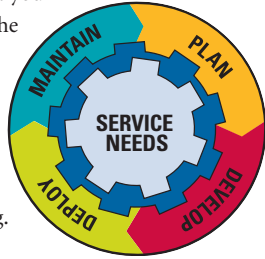
Includes data acquisition driver software.

### BUY ONLINE!

For complete product specifications, pricing, and accessory information, call (800) 813 3693 (U.S. only) or go to [ni.com/daq](http://ni.com/daq).

# 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](http://ni.com/services).



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## 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](http://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](http://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](http://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](http://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](http://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](http://ni.com/services).



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