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Find the *National Instruments USB-6008* at our website: ***Click HERE***



NI USB-6008

12-Bit, 10 kS/s Low-Cost Multifunction DAQ

With recent bandwidth improvements and new innovations from National Instruments, USB has evolved into a core bus of choice for measurement applications.

The NI USB-6008 and USB-6009 are low-cost data acquisition (DAQ) devices with easy screw connectivity and a small form factor. With plug-and-play USB connectivity, these devices are simple enough for quick measurements but versatile enough for more complex measurement applications.

- 8 analog inputs at 12 or 14 bits, up to 48 kS/s
- 2 analog outputs at 12 bits, software-timed
- 12 TTL/CMOS digital I/O lines
- One 32-bit, 5 MHz counter
- Digital triggering
- Bus-powered
- 1-year warranty

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Requirements and Compatibility

OS Information

- Windows 2000/XP
- Mac OS X
- Windows 7
- Windows CE
- Windows Mobile
- Windows Vista 64-bit
- Windows Vista 32-bit

Driver Information

- NI-DAQmx
- NI-DAQmx Base

Software Compatibility

- ANSI C/C++
- LabVIEW
- LabVIEW SignalExpress
- LabWindows/CVI
- Measurement Studio

Comparison Tables		
Product	**USB-6008**	**USB-6009**
Analog Inputs	8 single-ended/4 differential	8 single-ended/4 differential
Input Resolution	12	14
Max Sampling Rate (kS/s)	10	48
Analog Outputs	2	2
Output Resolution	12	12
Output Rate (Hz)	150	150
Digital I/O Lines	12	12
32-Bit Counter	1	1
Triggering	Digital	Digital

Application and Technology

The USB-6008 and USB-6009 are ideal for applications where a low-cost, small form factor and simplicity are essential. Examples include the following:

- Data logging – quick and easy environmental or voltage data logging
- Academic lab use – student ownership of data acquisition hardware for completely interactive lab-based courses (Academic pricing available. Visit ni.com/academic for details.)
- OEM applications as I/O for embedded systems

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 NI LabVIEW, LabVIEW SignalExpress, LabWindows™/CVI, and Measurement Studio software. To obtain the latest version of NI-DAQmx, visit ni.com/support/daq/versions.

NI measurement services software speeds up your development with features including the following:

- A guide to create fast and accurate measurements with no programming using the DAQ Assistant.
- Automatic code generation to create your application in LabVIEW.
- LabWindows/CVI; LabVIEW SignalExpress; and C#, Visual Studio .NET, ANSI C/C++, or Visual Basic using Measurement Studio.
- Multithreaded streaming technology for 1,000 times performance improvements.
- Automatic timing, triggering, and synchronization routing to make advanced applications easy.
- More than 3,000 free software downloads available at ni.com/zone to jump-start your project.
- Software configuration of all digital I/O features without hardware switches/jumpers.
- Single programming interface for analog input, analog output, digital I/O, and counters on hundreds of multifunction DAQ hardware devices. M Series devices are compatible with the following versions (or later) of NI application software – LabVIEW, LabWindows/CVI, or Measurement Studio versions 7.x; and LabVIEW SignalExpress 2.x.

Every National Instruments DAQ device includes a copy of LabVIEW SignalExpress LE data-logging software, so you can quickly acquire, analyze, and present data without programming. The NI-DAQmx Base driver software is provided for use with Linux, Mac OS X, Windows Mobile, and Windows CE operating systems.

Recommended Accessories

The USB-6008 and USB-6009 have removable screw terminals for easy signal connectivity. For extra flexibility when handling multiple wiring configurations, NI offers the USB-600x Connectivity Kit, which includes two extra sets of screw terminals, extra labels, and a screwdriver. In addition, the USB-600x Prototyping Kit provides space for adding more circuitry to the inputs of the USB-6008 or USB-6009.

NI USB DAQ for OEMs

Shorten your time to market by integrating world-class National Instruments OEM measurement products into your embedded system design. Board-only versions of NI USB DAQ devices are available for OEM applications, with competitive quantity pricing and available software customization. The NI OEM Elite Program offers free 30-day trial kits for qualified customers. Visit ni.com/oem for more information.

Information for Student Ownership

To supplement simulation, measurement, and automation theory courses with practical experiments, NI has developed the USB-6008 and USB-6009 student kits, which include the LabVIEW Student Edition and a ready-to-run data logger application. These kits are exclusively for students, giving them a powerful, low-cost, hands-on learning tool. Visit ni.com/academic for more details.

Information for OEM Customers

For information on special configurations and pricing, call (800) 813-3693 (U.S. only) or visit ni.com/oem. Go to the Ordering Information section for part numbers.

Detailed Specifications

The following specifications are typical at 25 °C, unless otherwise noted.

Analog Input	
Converter type	Successive approximation
Analog inputs	8 single-sided, 4 differential, software selectable
Input resolution	
NI USB-6008	12 bits differential, 11 bits single-ended
NI USB-6009	14 bits differential, 13 bits single-ended
Max sampling rate (aggregate) [1]	
NI USB-6008	10kS/s
NI USB-6009	48 kS/s
AI FIFO	512 bytes
Timing resolution	41.67 ns (24 MHz timebase)
Timing accuracy	100 ppm of actual sample rate
Input range	
Single-ended	±10 V
Differential	±20 V [2], ±10 V, ±5 V, ±4 V, ±2.5 V, ±2 V, ±1.25 V, ±1 V
Working voltage	±10 V
Input impedance	144 kΩ
Overvoltage protection	±35
Trigger source	Software or external digital trigger
System noise [3]	
Single-ended	
±10 V range	5 mVrms
Differential	
±20 V range	5 mVrms
±1 V range	0.5 mVrms

Absolute accuracy at full scale, single-ended		
Range	**Typical at 25 °C (mV)**	**Maximum over Temperature (mV)**
±10	14.7	138

Absolute accuracy at full scale, differential [4]		
Range	**Typical at 25 °C (mV)**	**Maximum over Temperature (mV)**
±20	14.7	138
±10	7.73	84.8
±5	4.28	58.4
±4	3.59	53.1
±2.5	2.56	45.1
±2	2.21	42.5
±1.25	1.70	38.9
±1	1.53	37.5

Analog Output

Analog outputs	2
Output resolution	12 bits
Maximum update rate	150 Hz, software-timed
Output range	0 to +5 V
Output impedance	50 Ω
Output current drive	5 mA
Power-on state	0 V
Slew rate	1 V/µs
Short circuit current	50 mA
Absolute accuracy (no load)	7 mV typical, 36.4 mV maximum at full scale

Digital I/O	
Digital I/O	
P0.<0..7>	8 lines
P1.<0..3>	4 lines
Direction control	Each channel indiviually programmable as input or output
Output driver type	
NI USB-6008	Open collector (open-drain)
NI USB-6009	Each channel individually programmable as active drive (push-pull) or open collector (open-drain)
Compatibility	TTL, LVTTL, CMOS
Absolute maximuim voltage range	-0.5 to 5.8 V with respect to GND
Pull-up resistor	4.7 kΩ to 5 V
Power-on state	Input

Digital Logic Levels			
Level	**Min**	**Max**	**Units**
Input low voltage	-0.3	0.8	V
Input high voltage	2.0	5.8	V
Input leakage current	–	50	µA
Output low voltage (I = 8.5 mA)	–	0.8	V
Output high voltage			
Active drive (push-pull), I = -8.5 mA	2.0	3.5	V
Open collector (open-drain), I = -0.6 mA, nominal	2.0	5.0	V
Open collector (open-drain), I = -8.5 mA, with external pull-up resistor	2.0	–	V

External Voltage	
+5 V output (200 mA maximum)	+5 V typical, +4.85 V minimum
+2.5 V output (1 mA maximum)	+2.5 V typical
+2.5 V accuracy	0.25% max
Reference temperature drift	50 ppm/°C max
Counter	
Number of counters	1
Resolution	32 bits
Counter measurements	Edge counting (falling-edge)
Counter direction	Count up
Pull-up resistor	4.7 kΩ to 5 V
Maximum input frequency	5 MHz
Minimum high pulse width	100 ns
Minimum low pulse width	100 ns
Input high voltage	2.0 V
Input low voltage	0.8 V

Power Requirements	
USB	
4.10 to 5.25 VDC	80 mA typical, 500 mA max
USB suspend	300 µA typical, 500 µA max
Physical Characteristics	
Dimensions	
Without connectors	6.35 cm x 8.51 cm x 2.31 cm (2.50 in. x 3.35 in. x 0.91 in.)
With connectors	8.18 cm x 8.51 cm x 2.31 cm (3.22 in. x 3.35 in. x 0.91 in.)
I/O connectors	USB series B receptacle, (2) 16 position terminal block plug headers
Weight	
With connectors	84 g (3 oz)
Without connectors	54 g (1.9 oz)
Screw-terminal wiring	16 to 28 AWG
Torque for screw terminals	0.22-0.25 N · m (2.0-2.2 lb · in.)

Safety

If you need to clean the module, wipe it with a dry towel.

Safety Voltages

Connect only voltages that are within these limits.

Channel-to-GND	±30 V max, Measurement Category I

Measurement Category I is for measurements performed on circuits not directly connected to the electrical distribution system referred to as MAINS voltage. MAINS is a hazardous live electrical supply system that powers equipment. This category is for measurements of voltages from specially protected secondary circuits. Such voltage measurements include signal levels, special equipment, limited-energy parts of equipment, circuits powered by regulated low-voltage sources, and electronics.

CAUTION. Do not use this module for connection to signals or for measurements within Measurement Categories II, III, or IV.

Safety Standards

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.

Hazardous Locations

The NI USB-6008/6009 device is not certified for use in hazardous locations.

Environmental

The NI USB-6008/6009 device is intended for indoor use only.

Operating temperatures	
(IEC 60068-2-1 and IEC 60068-2-2)	0 to 55 ˚C
Operating humidity	
(IEC 60068-2-56)	5 to 95% RH, noncondensing
Maximum altitude	2,000 m (at 25 ˚C ambient temperature)
Storage temperature	
(IEC 60068-2-1 and IEC 60068-2-2)	-40 to 85 ˚C
Storage humidity	
(IEC 60068-2-56)	5 to 90% RH, noncondensing
Pollution Degree (IEC 60664)	2

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 with double-shielded cables.

CE Compliance

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

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; 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 module number or product line, and click the appropriate link in the Certification column.

Environmental Management

National Instruments is committed to designing and manufacturing products is an enviromentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial not only to the environment but also to NI customers.

For additional environmental information, refer to the *NI and the Environment* Web page at ni.com/environment. This page contains the environmental regulations and directives with which NI complies, as well as other environmental information not included in this document.

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/enviroment/weee.htm.

电子信息产品污染控制管理办法 （中国 RoHS）

中国客户 National Instruments 符合中国电子信息产品中限制使用某些有害物质指令 (RoHS)。
关于 National Instruments 中国 RoHS 合规性信息，请登录 ni.com/environment/rohs_china。
(For information about China RoHS compliance, go to ni.com/environment/rohs_china.)

[1] System dependent.

[2] ±20 V means that |AI+ - (AI -)| ≥ 20 V. However, AI+ and AI - must both be within ±10 V of GND.

[3] System noise measured at maximum sample rate.

[4] Input voltages may not exceed the working voltage range.

System Assurance Programs

NI system assurance programs are designed to make it even easier for you to own an NI system. These programs include configuration and deployment services for your NI PXI, CompactRIO, or Compact FieldPoint system. The NI Basic System Assurance Program provides a simple integration test and ensures that your system is delivered completely assembled in one box. When you configure your system with the NI Standard System Assurance Program, you can select from available NI system driver sets and application development environments to create customized, reorderable software configurations. Your system arrives fully assembled and tested in one box with your software preinstalled. When you order your system with the standard program, you also receive system-specific documentation including a bill of materials, an integration test report, a recommended maintenance plan, and frequently asked question documents. Finally, the standard program reduces the total cost of owning an NI system by providing three years of warranty coverage and calibration service. Use the online product advisors at ni.com/advisor to find a system assurance program to meet your needs.

Technical Support

Get answers to your technical questions using the following National Instruments resources.

- **Support** - Visit ni.com/support to access the NI KnowledgeBase, example programs, and tutorials or to contact our applications engineers who are located in NI sales offices around the world and speak the local language.
- **Discussion Forums** - Visit forums.ni.com for a diverse set of discussion boards on topics you care about.
- **Online Community** - Visit community.ni.com to find, contribute, or collaborate on customer-contributed technical content with users like you.

Repair

While you may never need your hardware repaired, NI understands that unexpected events may lead to necessary repairs. NI offers repair services performed by highly trained technicians who quickly return your device with the guarantee that it will perform to factory specifications. For more information, visit ni.com/repair.

Training and Certifications

The NI training and certification program delivers the fastest, most certain route to increased proficiency and productivity using NI software and hardware. Training builds the skills to more efficiently develop robust, maintainable applications, while certification validates your knowledge and ability.

Classroom training in cities worldwide - the most comprehensive hands-on training taught by engineers.

On-site training at your facility - an excellent option to train multiple employees at the same time.

Online instructor-led training - lower-cost, remote training if classroom or on-site courses are not possible.

Course kits - lowest-cost, self-paced training that you can use as reference guides.

Training memberships and training credits - to buy now and schedule training later.

Visit ni.com/training for more information.

Extended Warranty

NI offers options for extending the standard product warranty to meet the life-cycle requirements of your project. In addition, because NI understands that your requirements may change, the extended warranty is flexible in length and easily renewed. For more information, visit ni.com/warranty.

OEM

NI offers design-in consulting and product integration assistance if you need NI products for OEM applications. For information about special pricing and services for OEM customers, visit ni.com/oem.

Alliance

Our Professional Services Team is comprised 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.

Software Recommendations



NI LabVIEW Full Development System for Windows

- Easy-to-use graphical development environment
- Tight integration with a wide range of measurement hardware
- Rapid user interface development for displaying live data
- Extensive signal processing, analysis, and math functionality
- Multiple communication options (TCP/IP, UDP, serial, and more)
- Support for Windows XP/Vista/7 (32-bit) and Windows Vista/7 (64-bit)



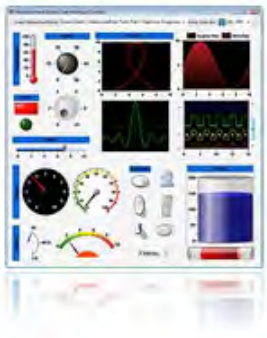
NI LabVIEW SignalExpress for Windows

- Quickly configure projects without programming
- Control over 400 PC-based and stand-alone instruments
- Log data from more than 250 data acquisition devices
- Perform basic signal processing, analysis, and file I/O
- Scale your application with automatic LabVIEW code generation
- Create custom reports or easily export data to LabVIEW, DIAdem or Microsoft Excel



NI LabWindows™/CVI for Windows

- Real-time advanced 2D graphs and charts
- Complete hardware compatibility with IVI, VISA, DAQ, GPIB, and serial
- Analysis tools for array manipulation, signal processing statistics, and curve fitting
- Simplified cross-platform communication with network variables
- Measurement Studio .NET tools (included in LabWindows/CVI Full only)
- The mark LabWindows is used under a license from Microsoft Corporation



NI Measurement Studio Standard Edition

- Support for Microsoft Visual Studio .NET 2010/2008/2005
- Customizable Windows Forms controls for test and measurement user interface design
- Hardware integration support with data acquisition and instrument control libraries
- Easy application design with Windows Forms project wizards
- Analysis libraries for basic signal generation

Ordering Information

For a complete list of accessories, visit the product page on ni.com.

Products	Part No.
NI USB-6008	
NI USB-6008 with NI-DAQmx software, LabVIEW SignalExpress LE, and a USB cable.	779051-01
NI USB-6008 OEM (no enclosure)	193132-02
NI USB-6008 Student Kit with NI-DAQmx software, LabVIEW SignalExpress LE, and a USB cable. Includes LabVIEW Student Edition.	779320-22
Prototyping Kit	
NI USB-600x Prototyping Kit	779511-01
Connectivity Kit	
NI USB-600x Connectivity Kit	779371-01
NI USB-6009	
NI USB-6009 OEM (no enclosure)	193132-01
NI USB-6009 Student Kit with NI-DAQmx software, LabVIEW SignalExpress LE, and a USB cable. Includes LabVIEW Student Edition.	779321-22
NI USB-6009 with NI-DAQmx software, LabVIEW SignalExpress LE, and a USB cable.	779026-01

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Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

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