ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *National Instruments USB-6525* at our website: ***Click HERE***

Industrial Digital I/O Device for USB – 60 V, Channel-to-Channel Isolated

NI USB-6525

- Small, portable digital I/O device
- Eight channel-to-channel optically isolated inputs (±60 VDC)
- Eight channel-to-channel optically isolated, solid-state relay outputs (60 VDC/30 V_{rms} max)
- 500 mA maximum switching current per channel
- One 32-bit event counter
- Full-speed USB (12 Mb/s) bus interface
- Built-in, removable connectors for easy connectivity
- USB cable strain relief

Operating Systems

- Windows Vista/XP/2000

Recommended Software

- LabVIEW
- LabWindows™/CVI
- Measurement Studio
- LabVIEW SignalExpress

Other Compatible Software

- Visual Studio .NET
- C, C++
- Visual Basic

Measurement Services Software (included)

- NI-DAQmx driver software
- Measurement & Automation Explorer configuration utility
- LabVIEW SignalExpress LE data-logging software



Product	Digital Inputs	Low Threshold	High Threshold	Input Current	SSR Outputs	Switching Current	Max Signal Range	Isolation	32-Bit Counters
NI USB-6525	8	1 VDC	3.2 VDC	3 mA/ch	8	500 mA	±60 VDC	Ch-to-Ch	1

Table 1. NI USB-6525 Specifications Overview

Overview and Applications

The National Instruments USB-6525 is a full-speed USB device with eight normally open, channel-to-channel isolated, solid-state relay outputs and eight ±60 VDC channel-to-channel isolated digital inputs. The NI USB-6525 offers features for industrial control and manufacturing test applications, such as factory automation, embedded machine control, and production line verification. The solid-state relay outputs have a 60 VDC/30 V_{rms} switching voltage and 500 mA/ch maximum switching current, making them ideal for controlling pumps, valves, motors, and other industrial actuators. The eight isolated digital input channels break ground loops and offer protection from noise and spikes on external signals. You can also use one of the digital input channels as a 5 kHz, 32-bit event counter for counting digital pulses.

Hardware

The USB-6525 has eight channel-to-channel optically isolated inputs, P1.<0..7>, and eight channel-to-channel optically isolated, solid-state relay outputs, P0.<0..7>. The isolated inputs consist of an optocoupler, a depletion-mode MOSFET-based current-limiting circuit, and a Schottky diode. Each channel has its own positive and negative terminals capable of detecting a wide range of DC signals, from 5 V TTL logic levels to DC power supply levels up to 60 V.

PFI 0 (an alias to P1.7) can also function as the source for a 32-bit counter. In this mode, the device counts low to high transitions on P1.7. You can arm and disarm the counter as well as read or reset the count through software.

You can connect loads to the solid-state relay outputs with an AC or DC power source. The default power-on state of the solid-state relays is open. The relays also remain open when the computer and the USB-6525 device are powered off.

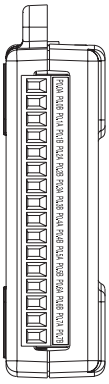
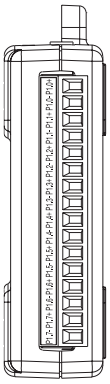
Module	Terminal	Signal	Module	Terminal	Signal
	1	P0.0A		17	P1.0+
	2	P0.0B		18	P1.0-
	3	P0.1A		19	P1.1+
	4	P0.1B		20	P1.1-
	5	P0.2A		21	P1.2+
	6	P0.2B		22	P1.2-
	7	P0.3A		23	P1.3+
	8	P0.3B		24	P1.3-
	9	P0.4A		25	P1.4+
	10	P0.4B		26	P1.4-
	11	P0.5A		27	P1.5+
	12	P0.5B		28	P1.5-
	13	P0.6A		29	P1.6+
	14	P0.6B		30	P1.6-
	15	P0.7A		31	P1.7+/PFI 0+
	16	P0.7B		32	P1.7-/PFI 0-

Table 2. NI USB-6525 Pinout

NATIONAL INSTRUMENTS™

Isolation

Isolation is a form of built-in signal conditioning that provides an extended voltage range for direct connectivity to industrial sensors and actuators. The USB-6525 provides channel-to-channel isolation where each channel is physically and electrically separated from the others.

Isolation provides three main benefits:

1. Safety from hazardous high voltages and transients
2. Rejection of common-mode voltages
3. Removal of ground loops

Safety from High-Voltage Transients

Isolation electrically separates high-voltage front-end channels from each other and the low-voltage back end of the USB-6525. Signals are passed between the two sections of the device using optocouplers. By separating the two sections, any voltages within the isolation specifications are prevented from entering the USB bus section or other channels. Isolation provides protection for the user, data acquisition system, and measurement data.

Common-Mode Voltage Rejection

A voltage common to both sides of a differential circuit pair is called common-mode voltage. This phenomenon is typical in noisy environments containing machinery and inductive loads. The differential voltage across the circuit pair is the desired signal, whereas the common voltage signal is the unwanted signal that may have been coupled into the transmission line. The USB-6525 can measure signals from lines with signal plus common-mode voltage of up to 60 VDC.

Ground Loop Removal

Ground loops are the most common source of noise in data acquisition applications. They occur when two connected terminals in a circuit are at different ground potentials, causing current to flow between the two points. This additional voltage can cause significant error in the measurement. When a ground loop exists, the measured voltage is the sum of the signal voltage and the potential difference that exists between the signal source ground and the measurement system ground. This potential is generally not a DC level; therefore, the result is a noisy measurement system. By offering an isolated floating ground on the front end, the isolated USB-6525 devices are able to prevent ground loops from forming.

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**. NI measurement services software speeds up your development with features including:

- A guide to create fast and accurate measurements with no programming using DAQ Assistant
- Automatic code generation to create your application in LabVIEW; LabWindows/CVI; LabVIEW SignalExpress; and Visual Studio .NET, C/C++/C#, or Visual Basic using Measurement Studio
- Multithreaded streaming technology
- More than 3,000 free software downloads to jump-start your project available at **ni.com/zone**
- Software configuration of all digital I/O features without hardware switches/jumpers
- Free LabVIEW SignalExpress LE data-logging software

The USB-6525 is compatible with the following versions (or later) of NI application software – LabVIEW, LabWindows/CVI, and Measurement Studio versions 7.x or LabVIEW SignalExpress. You can also use your NI digital I/O device with ANSI C, Microsoft Visual C++, Visual Basic, and the Microsoft .NET languages C# and Visual Basic .NET. The USB-6525 is not compatible with the Traditional NI-DAQ (Legacy) driver.

Ordering Information

NI USB-6525 779640-01
Includes NI-DAQmx software, LabVIEW SignalExpress LE data-logging software, and a USB cable.

NI USB-6000 Series Prototyping Accessory 779511-01
Includes breadboarding area with cover and strain relief.

BUY NOW!

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

Specifications

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

Isolated Inputs

Number of channels ..... 8, ch-ch isolated
Input voltage range ..... -60 to 60 VDC

Digital logic levels

Level	Min	Max
Input low voltage	-60 VDC	1 VDC
Input high voltage	3.2 VDC	60 VDC

Input current ..... 3.0 mA/channel max

Solid-State Relay Outputs

Number of channels ..... 8, ch-ch isolated
Relay type ..... Normally open solid-state relay (SSR)
Switching voltage ..... 60 VDC/30 V_{rms} max
Switching current (per channel) ..... 500 mA max, full operation temperature range
Switching rate (90% duty cycle) ..... 5 operations per second
Relay open time ..... 60 µs typ
Relay close time ..... 1.2 ms typ
On-resistance ..... 550 mΩ, max
Off-leakage current (max) ..... 0.6 µA typ

Counter

Number of counters ..... 1 (P1.7 can be configured as a counter)
Resolution ..... 32 bits
Counter measurements ..... rising edge counting
Maximum input frequency ..... 5 kHz
Minimum high pulse width ..... 20 µs
Minimum low pulse width ..... 180 µs

Bus Interface

USB specification ..... USB 2.0 full-speed (12 Mb/s)

Power Requirements

Input voltage ..... 4.5 to 5.25 VDC in configured state
Active current ..... 150 mA max
Suspend current ..... 350 µA typ

Physical Characteristics

Dimensions
  Without connectors ..... 6.35 by 8.51 by 2.31 cm (2.50 by 3.35 by 0.91 in.)
  With connectors ..... 8.18 by 8.51 by 2.31 cm (3.22 by 3.35 by 0.91 in.)
I/O connectors ..... USB series B receptacle, (2) 16 position (screw terminal) plug headers
Screw-terminal wiring ..... 16 to 28 AWG copper conductor wire with 10 mm (0.39 in.) of insulation stripped from the end
Torque for screw terminals ..... 0.22 to 0.25 N · m (2.0 to 2.2 lb in.)
Weight
  With connectors ..... Approx. 87 g (3.1 oz)
  Without connectors ..... Approx. 64 g (2.3 oz)

Isolation

Channel-to-channel ..... 60 VDC continuous
Channel-to-earth ground ..... 60 VDC continuous
Withstand ..... 60 VDC continuous

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

Environment

NI 6528 and PXI-6529 devices are intended for indoor use only.
Pollution degree (IEC-60664) 2

Operating Environment

Ambient temperature ..... 0 to 55 °C
Relative humidity ..... 10 to 90%, noncondensing
Maximum altitude ..... 2,000 m at 25 °C ambient temperature

(tested in accordance with IEC-60068-2-1, IEC-60068-2-2, and IEC-60068-2-56)

Storage Environment

Ambient temperature ..... -40 to 85 °C
Relative humidity ..... 5% to 95%, noncondensing

(tested in accordance with IEC-60068-2-1, IEC-60068-2-2, and IEC-60068-2-56)

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 NI Professional Services team is composed of NI applications and systems engineers 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**.

NATIONAL INSTRUMENTS™
Certified Alliance Partner

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**.

NATIONAL INSTRUMENTS™

ni.com • 800 813 3693
National Instruments • info@ni.com

351494A-01 2007-8768-301-101-D

© 2007 National Instruments Corporation. All rights reserved. CVI, LabVIEW, Measurement Studio, National Instruments, National Instruments Alliance Partner, NI, ni.com, SCXI, and SignalExpress are trademarks of National Instruments. The mark LabWindows is used under a license from Microsoft Corporation. Other product and company names listed are trademarks or trade names of their respective companies. A National Instruments Alliance Partner is a business entity independent from NI and has no agency, partnership, or joint-venture relationship with NI.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

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.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP