

NI 6521 Specifications

This document lists specifications for the NI 6521 device. All specifications are subject to change without notice. These specifications are typical at 25 °C unless otherwise noted.

Certification	UL listed
Maximum working voltage	
Channel-to-channel	150 V
Channel-to-earth	150 V, Measurement Category II



Caution This module is rated for Measurement Category II and is intended to carry signal voltages no greater than 150 V. This module can withstand up to 1,500 V impulse voltage. Do *not* use this module for connection to signals or for measurements within Categories III or IV. Do *not* connect to MAINS supply circuits greater than 150 VAC. Refer to the *NI 6520/6521 User Guide* for more information about measurement categories.

When hazardous voltages ($>42.4 V_{pk}/60$ VDC) are present on any signal, all signals must be considered hazardous. Ensure that external wiring or any circuits connected to the device are properly insulated from human contact.



Caution This product must be used with special keyed cables and accessories. Refer to the [Accessories](#) section of this document and the *37-Pin High-Voltage Accessory Safety Kit Installation Guide* shipped with your device for more information.



Caution The PCI-6521 must be installed in a PC that adequately grounds the front panel bracket to the chassis of the PC.



Caution Do *not* remove covers from the PCI-6521. Doing so can result in electrical shock or death.



Caution Use the PXI-6521 in a PXI chassis with properly installed PXI filler panels.

Do *not* remove the filler panels from the PXI-6521. Doing so can result in electrical shock or death.

Digital I/O

Number of channels	16 (eight optically isolated digital input channels and eight non-latching relay output channels)
Data transfers.....	Interrupts, programmed I/O
I/O connector.....	37-pin keyed male D-SUB

Isolated Inputs

Number of input channels	8 (each bipolar and isolated from other channels)
Configuration	8-channel optically isolated digital inputs
Input voltage range.....	-30 VDC to 30 VDC, P0.X+ to P0.X-; 150 V, channel-to-earth ¹

¹ The voltage added on P0.X+ can reach up to 150 VDC. The voltage added on P0.X- can reach up to 150 VDC. However, the voltage drop from P0.X+ to P0.X- should be limited within ± 30 VDC.

Isolation

- Channel-to-channel60 VDC continuous¹
- Channel-to-bus150 V continuous²
- Channel-to-earth150 V continuous³

Digital logic levels

Level	Min	Max
Input low voltage	0 VDC	±4 VDC
Input high voltage	±11 VDC	±30 VDC

Input current

- 11 V inputs4.5 mA/channel max
- 30 V inputs12.5 mA/channel max

Propagation delay45 µs typ

Electromechanical Relay Outputs

- Number of channels8
- Configuration3-channel SPDT, non-latching;
5-channel SPST, non-latching
- Relay types3 non-latching SPDT (Form C),
5 non-latching SPST (Form A)
- Power-on stateDe-energized, default; user-programmable to de-energized or energized



Note The response time of programmable power-up states is 400 ms.

Default power-off stateRelays de-energized



Caution The maximum switching current is limited by the maximum switching power, the maximum voltage, and must not exceed 60 W/60 VA.

Contact rating

- Maximum switching power60 W/60 VA
- Maximum voltage (AC)150 VAC, CAT II

Maximum voltage (DC) 150 VDC, CAT II

Maximum current

- PXI-6521 (per channel) 2 A⁴
- PCI-6521 (per channel) Refer to Figure 1

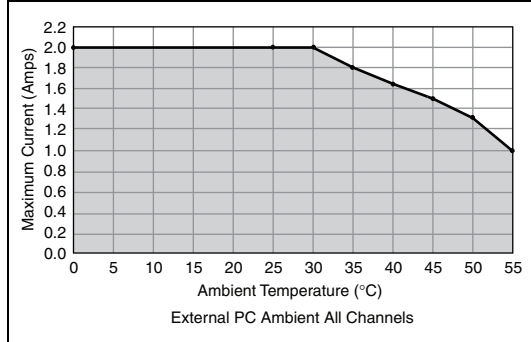


Figure 1. Maximum Current for Ambient Temperatures ≤55 °C

DC path resistance

- Initial <0.2 Ω typ
- End of life ≥1.0 Ω typ

Relay operate time 2 ms typ
4 ms max

Expected relay life

- Mechanical 100,000,000 cycles
- Electrical
 - 30 VDC, 1 ADC resistive 500,000 cycles
 - 30 VDC, 2 ADC resistive 100,000 cycles
 - 125 VAC, 0.2 AAC resistive 300,000 cycles
 - 125 VAC, 0.5 AAC resistive 100,000 cycles

Power Requirement

PXI-6521

- 3.3 V (±5%) 100 mA max
- 5 V (±5%) 300 mA typ,
500 mA max

PCI-6521

- 5 V (±5%) 400 mA typ,
600 mA max

¹ Verified by 620 Vrms dielectric withstand test, 5 s.
² Verified by 1,400 Vrms dielectric withstand test, 5 s.
³ Verified by 850 Vrms dielectric withstand test, 5 s.
⁴ All relay channels—external PXI chassis ambient, up to 55 °C.

Physical Characteristics

PXI-6521

Dimensions 16 cm × 10 cm
(6.3 in. × 3.9 in.)

Weight 150.0 g (5.0 oz)

PCI-6521

Dimensions 17.5 cm × 9.9 cm
(6.9 in. × 3.9 in.)

Weight 170.0 g (6.0 oz)

Pin Assignments

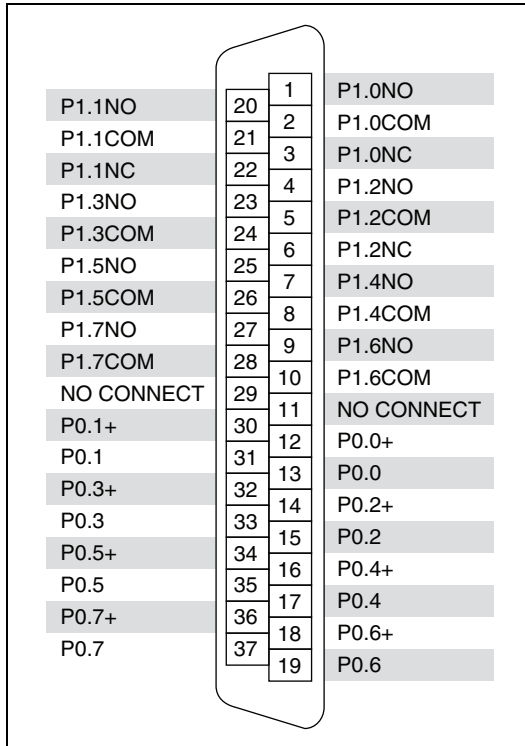


Figure 2. NI 6521 Pin Assignments

Accessories

(PXI-6521 Only) TB-2621, High-Voltage
CAT II 150 V 37-Pin Front-Mounting
PXI Terminal Block 779444-01

SH37F-37M-2 37-Pin Female-to-Male
Shielded I/O Cable, 2 m 778621-02

SH37F-37M-1 37-Pin Female-to-Male
Shielded I/O Cable, 1 m 778621-01

CB-37F-HVD 37-Pin High-Voltage DIN
Rail Mountable Terminal Block 779491-01

37-Pin High-Voltage
Accessory Safety Kit 779445-01

TB-37F-37CP 37-Pin
Crimp and Poke Terminals 779185-01

Environmental

The NI 6521 device is intended for indoor use only.

Operating Environment

Ambient temperature range 0 to 55 °C
(tested in accordance with
IEC-60068-2-1 and
IEC-60068-2-2)

Relative humidity range 10 to 90%,
noncondensing
(tested in accordance with
IEC-60068-2-56)

Altitude 2,000 m (at 25 °C
ambient temperature)

Pollution Degree 2

Storage Environment

Ambient temperature range -20 to 70 °C
(tested in accordance with
IEC-60068-2-1 and
IEC-60068-2-2)

Relative humidity range 5 to 95%, noncondensing
(tested in accordance with
IEC-60068-2-56)

Shock and Vibration (PXI-6521 Only)

Operational shock 30 g peak, half-sine,
11 ms pulse
(tested in accordance with
IEC-60068-2-27; test
profile developed in
accordance with
MIL-PRF-28800F)

Random vibration

Operating 5 to 500 Hz, 0.3 grms
Nonoperating 5 to 500 Hz, 2.4 grms

Random vibration is tested in accordance with
IEC-60068-2-64. The nonoperating test profile exceeds the
requirements of MIL-PRF-28800F, Class 3.

Safety

This product meets 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 the *Online Product Certification* section.

Electromagnetic Compatibility

This product meets the requirements of the following EMC standards for electrical equipment for measurement, control, and laboratory use:

- EN 61326 (IEC 61326): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions



Note For the standards applied to assess the EMC of this product, refer to the *Online Product Certification* section.



Note For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives as follows:

- 2006/95/EC; Low-Voltage Directive (safety)
- 2004/108/EC; Electromagnetic Compatibility Directive (EMC)

Online Product Certification

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and 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.

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Waste Electrical and Electronic Equipment (WEEE)



EU Customers At the end of the product life cycle, all products must be sent to a WEEE recycling center. For more information about WEEE recycling centers, National Instruments WEEE initiatives, and compliance with WEEE Directive 2002/96/EC on Waste Electrical and Electronic Equipment, visit ni.com/environment/weee.

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