

NI PXI-4110 Specifications

Triple-Output Programmable DC Power Supply

This document lists specifications for the NI PXI-4110 triple-output programmable DC power supply. All specifications are subject to change without notice. For the most current specifications, visit ni.com/manuals.

DC Specifications

Channel	DC Voltage	Isolation [*]	DC Current (Power)			
			Auxiliary Power		Internal Power	
			20 mA Range	1 A Range	20 mA Range	1 A Range
0	0 V to +6 V	N/A	N/A	1 A (6 W)	N/A	1 A (6 W)
1	0 V to +20 V	60 VDC, CAT I	20 mA	1 A (20 W)	20 mA	100 mA (2 W) [†]
2	0 V to -20 V	60 VDC, CAT I	20 mA	1 A (20 W)	20 mA	100 mA (2 W) [†]

^{*} Channels 1 and 2 are isolated from ground but not from each other.
[†] When internally powered, the combined outputs of channels 1 and 2 must not exceed 3 W total.



Note The NI PXI-4110 is a single-quadrant power supply with three output channels. In this document, channel 0 refers to the 0 V to +6 V output, channel 1 refers to the 0 V to +20 V output, and channel 2 refers to the 0 V to -20 V output.

Voltage Programming Accuracy/Resolution

Channel	Range	Resolution	Accuracy \pm (% of output + offset)	
			1 Year 23 °C \pm 10 °C	Tempco/ [°] C 0 °C to 55 °C
0	+6 V	0.12 mV	0.05 + 4 mV	0.005 + 0.3 mV
1	+20 V	0.40 mV	0.05 + 10 mV	0.005 + 1 mV
2	-20 V	0.40 mV	0.05 + 10 mV	0.005 + 1 mV

Tempco = temperature coefficient

Current Output Accuracy/Resolution*

Channel(s)	Range [†]	Resolution	Accuracy ± (% of output + offset)	
			1 Year 23 °C ± 10 °C	Tempco/°C 0 °C to 55 °C
0	1 A	0.02 mA	0.15 + 4 mA	0.02 + 0.2 mA
1 and 2	20 mA	0.40 μA	0.15 + 35 μA	0.01 + 3 μA
	1 A	0.02 mA	0.15 + 4 mA	0.02 + 0.2 mA

Tempco = temperature coefficient
 * Calibrated at half of voltage range on channel. Applies to current limits greater than 2% of range. Applies to output current up to 500 mA. For output current greater than 500 mA, refer to the derating information in Figure 1.
 † Minimum programmable current limit is 1% of range.

Voltage Measurement Accuracy/Resolution*

Channel	Range	Resolution	Accuracy ± (% of reading + offset)	
			1 Year 23 °C ± 10 °C	Tempco/°C 0 °C to 55 °C
0	+6 V	0.06 mV	0.05 + 4 mV	0.005 + 0.2 mV
1	+20 V	0.20 mV	0.05 + 5 mV	0.005 + 0.5 mV
2	-20 V	0.20 mV	0.05 + 5 mV	0.005 + 0.5 mV

Tempco = temperature coefficient
 * Using the niDCPower **Samples to Average** property/attribute set to 300.

Current Measurement Accuracy/Resolution*

Channel(s)	Range	Resolution	Accuracy ± (% of reading + offset)	
			1 Year 23 °C ± 10 °C	Tempco/°C 0 °C to 55 °C
0	1 A	0.01 mA	0.10 + 2 mA	0.010 + 0.2 mA
1 and 2	20 mA	0.20 μA	0.05 + 15 μA	0.005 + 1.5 μA
	1 A	0.01 mA	0.10 + 2 mA	0.010 + 0.2 mA

Tempco = temperature coefficient
 * Using the niDCPower **Samples to Average** property/attribute set to 300. Applies to output current up to 500 mA. For output current greater than 500 mA, refer to the derating information in Figure 1.

Voltage Output Speed*

Channel(s)	Auxiliary Power				Internal Power			
	Rise Time [†]		Fall Time [‡]		Rise Time [†]		Fall Time [‡]	
	Full Load	No Load	Full Load	No Load	Full Load	No Load	Full Load	No Load
0	<1 ms	<1 ms	<1 ms	<25 ms	same as auxiliary power			
1 and 2	<1 ms	<1 ms	<2 ms	<56 ms	<20 ms	<10 ms	<15 ms	<56 ms

* Current limit set to 1 A for auxiliary power or 100 mA for internal power, resistive load. For 20 mA range, all voltage output speeds are <80 ms.

[†] Rise time is from 10% to 90% of programmed voltage change at maximum current.

[‡] Fall time is from 90% to 10% of programmed voltage change at maximum current.

Line* and Load Regulation

Channel(s)	Line Regulation [†] ± (% of output + offset)		Load Regulation ± % of range selected	
	Voltage	Current	Voltage [‡] (per amp of output load)	Current (per volt of output change)
0	N/A	N/A	0.42	0.02
1 and 2	0.01 + 1 mV	0.01 + 0.02% of range	0.1	0.007 (0.003 for 20 mA range)

* Line regulation applies to the auxiliary power input only.

[†] Per volt of change in auxiliary power input.

[‡] Measured at output channel terminals.

Ripple and Noise

Channel(s)	RMS Normal-Mode Voltage*	RMS Normal-Mode Current [†] (20 mA into 500 Ω load)
0	<1.5 mV	<8 μA
1 and 2	<1 mV	<8 μA (<3 μA for 20 mA range)

* Voltage noise measured from 20 Hz to 20 MHz.

[†] Current noise bandwidth is limited to 10 kHz for 1 A range and 400 Hz for 20 mA range.

General Specifications

Sampling rate

Default300/s (10 samples averaged)

Maximum.....3,000/s

Transient response (typical)Recovers to <0.1% of voltage range within 50 μ s after a change in load current from 50% to 100% of current range.

Output channel protection

Overvoltage.....Tolerates 14 VDC over rated output

Overcurrent or reverse voltage....Fused

OvertemperatureAutomatic shutdown

Auxiliary power input protection

Overvoltage.....>15.5 VDC shut-off; >20 VDC crowbar (fused)

Overcurrent or reverse voltage....Fused

Warm-up.....15 minutes

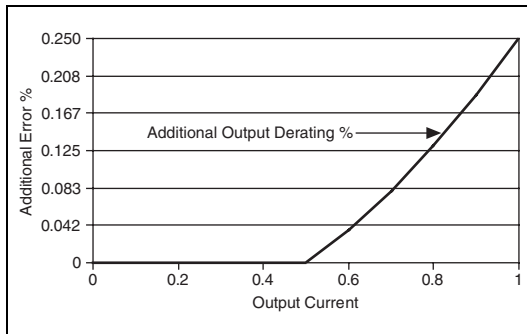


Figure 1. Accuracy Derating vs. Load Current

Physical Characteristics

Dimensions3U, one-slot, PXI/cPCI module; 2.0 cm \times 13.0 cm \times 21.6 cm (0.8 in. \times 5.1 in. \times 8.5 in.)

Weight323 g

User-replaceable fuses

Output channels (internally-socketed)3, Littelfuse 045301.5 (F 1.5 A 125 V)



Note A spare output channel fuse is located near the rear PXI connector of the NI PXI-4110.

Auxiliary power input (front panel-mount) 1, 5 \times 20 mm glass fuse (T 6.3 A L 250 V)



Note NI recommends Littelfuse 21806.3.

I/O connectors

Output channels MINI-COMBICON, 3.81 mm (6 position)

Auxiliary power input MINI-COMBICON, 3.5 mm (2 position)



Note I/O connectors can accept wire gauges from 16 AWG to 28 AWG. NI recommends 18 AWG or lower.

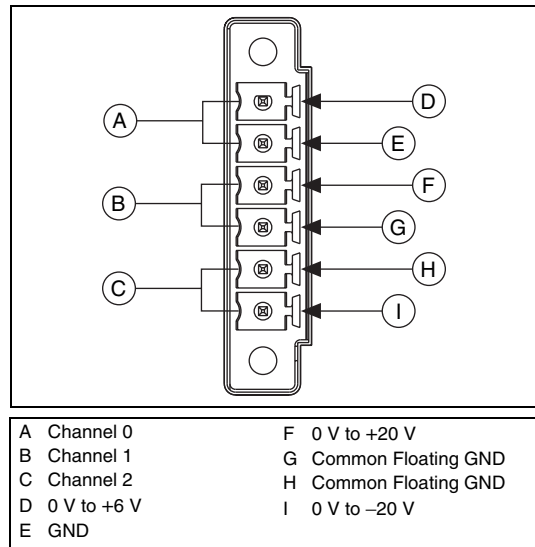


Figure 2. NI PXI-4110 Output Connector

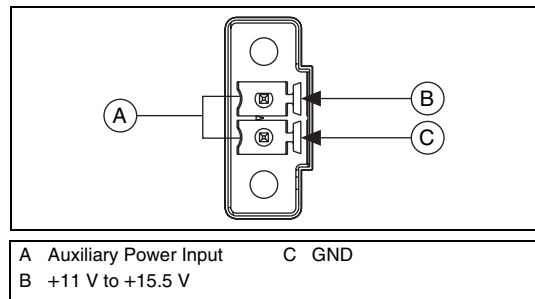


Figure 3. NI PXI-4110 Auxiliary Power Input Connector

Power Requirements

Auxiliary power source (optional; channels 1 and 2 only)

Input requirements..... 11 VDC to 15.5 VDC,
5 A max



Note For information about cascading multiple NI PXI-4110 devices, refer to the *NI DC Power Supplies Help* at ni.com/manuals.

Environment

Maximum altitude..... 2,000 m (at 25 °C
ambient temperature)

Pollution Degree 2

Indoor use only.

Operating Environment

Ambient temperature range 0 °C 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.)

Storage Environment

Ambient temperature range -40 °C 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

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 Hz to 500 Hz, 0.3 g_{rms}

Nonoperating 5 Hz to 500 Hz, 2.4 g_{rms}
(Tested in accordance
with IEC-60068-2-64.
Nonoperating test profile
exceeds the requirements
of MIL-PRF-28800F,
Class 3.)

Accessories

Visit ni.com for more information about the following accessory.

Table 1. NI Accessories for the NI PXI-4110

Accessory	Description	Part Number (P/N)
NI APS-4100	Auxiliary power source for NI DC power supplies	779671-01



Caution You *must* install mating connectors according to local safety codes and standards and according to the specifications provided by the manufacturer. You are responsible for verifying the safety compliance of third-party connectors and their usage according to the relevant standard(s), including UL and CSA in North America and IEC and VDE in Europe.

Table 2. Third-Party Accessories for the NI PXI-4110

Accessory	Description	Manufacturer	P/N
MINI-COMBICON, 3.81 mm (6 position)	Mating connector for output channels	Phoenix Contact	1714964
MINI-COMBICON, 3.81 mm (6 position) backshell	Backshell for output channels mating connector	Phoenix Contact	1714993
MINI-COMBICON, 3.5 mm (2 position)	Mating connector for auxiliary power input	Phoenix Contact	1714977
MINI-COMBICON, 3.5 mm (2 position) backshell	Backshell for auxiliary power input	Phoenix Contact	1714980
Chip fuse (F 1.5 A 125 V)	Output channel fuse	Littelfuse	045301.5
5 × 20 mm, glass fuse (T 6.3 A L 250 V)	Auxiliary power input fuse	Littelfuse	21806.3

Compliance and Certifications

Safety

Maximum Voltage*



Caution Connect only voltages that are within these limits.

Channel-to-COM.....14 VDC over rated output, CAT I



Caution Do not connect to signals or use for the measurements within CAT II, III, or IV.

Cascading multiple channels

Channel-to-GND.....60 VDC max

Isolation Voltage

Channels 1- and 2-to-earth ground

Continuous60 VDC, CAT I, verified by dielectric withstand test, 5 s

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, CAN/CSA-C22.2 No. 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 with shielded cabling.

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.

* The maximum voltage that can be applied or output between any port or V_{SUP} terminal and a COM terminal without creating a safety hazard.

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