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NI 6703/6704 Specifications

This document lists specifications for the NI PCI-6703 and NI PCI/PXI-6704. These specifications are valid for an ambient temperature of 0 to 55 °C, unless otherwise noted.

Analog Output

Number of voltage channels 16

Number of current channels (NI 6704 only) 16

Resolution 16-bit

Recommended warm-up time ..... 15 minutes

Transfer Characteristics

INL ..... ±1 LSB max

DNL ..... ±1 LSB max

Monotonicity ..... 16 bits, guaranteed

Voltage Output

Range ..... ±10.1 V

Output coupling ..... DC

Output impedance ..... 0.1 Ω max

Current drive ..... ±10 mA max

Load capacitance ..... 10,000 pF max

Protection ..... Short-circuit to ground

Noise ..... 100 μV_{rms}, DC to 1 MHz

Power-on state ..... Independent, user-defined values

Current Output (NI 6704 Only)

Range ..... 0.1 to 20.2 mA

Type ..... Source, does not require external excitation source

Output impedance ..... 1 GΩ min

Output compliance ..... 0 to 10 V, not clamped

Noise ..... 1 μA_{rms}, DC to 1 MHz

Protection ..... Short-circuit and open circuit

Power-up state ..... Independent, user-defined values

Accuracy Information

Output Type	Nominal Range at Full Scale	Absolute Accuracy					Absolute Accuracy at Full Scale	
		% of Reading			Offset	Temp Drift (%/°C)		
		24 Hours	90 Days	1 Year			24 Hours	1 Year
Voltage	±10.1 V	0.0019%	0.0026%	0.0035%	±710 µV	0.0001%	0.91 mV	1.07 mV
Current*	0.1–20.2 mA	0.0034%	0.0088%	0.0150%	±1,435.0 nA	0.0002%	2.16 µA	4.48 µA

Note: Temp drift applies only if ambient is greater than ±10 °C of previous external calibration. Absolute Accuracy at Full Scale calculations assume full scale output.

* NI 6704 only

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Dynamic Characteristics

Settling time (including channel latency)

Accuracy	Time
±0.1%	1.8 ms typ, 5.6 ms max
±0.01%	3.6 ms typ, 11.2 ms max
±0.001%	14.4 ms typ, 48.8 ms max

Stability

Offset temperature coefficient

Voltage.....5 µV/ ºC

Current (NI 6704 only) .....10 nA/ ºC

Gain temperature coefficient

Voltage.....1 ppm/ ºC

Current (NI 6704 only) .....2 ppm/ ºC

Digital I/O

Number of channels.....8

Compatibility.....TTL

Power-on state .....Input (high impedance)

Digital logic levels

Level	Min	Max
Input low voltage	—	0.8 V
Input high voltage	2.0 V	—
Output low voltage	—	0.55 V, I_{OL} = 16 mA
Output high voltage	2.4 V, I_{OH} = 16 mA	—
Input leakage current	—	10 µA

Bus Interface

Type.....Slave

Power Requirement

+5 V

NI 6703..... 1.5 A

NI 6704..... 2.6 A

+12 V ..... 70 mA

–12 V..... 70 mA[1]

Note These power usage figures do not include the power used by external devices that are connected to the fused supply present on the I/O connector. They assume that all voltage and current outputs are fully loaded.

Power available at I/O connector.... +4.5 to +5.25 VDC at 0.75 A

Physical

Dimensions (not including connectors)

NI PCI-6703/6704 ..... 9.9 × 17.5 cm (3.9 × 6.9 in.)

NI PXI-6704..... 10 × 16 cm (3.9 × 6.3 in.)

I/O connector ..... 68-pin male

Maximum Working Voltage

Maximum working voltage refers to the signal voltage plus the common-mode voltage.

Channel-to-earth ..... 11 V, 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. 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 device for connection to signals or for measurements within Measurement Categories II, III, or IV.

[1] NI PXI-6704 devices do not use power from the –12 V rail.

Environmental

The NI 6703/6704 is intended for indoor use only.

Operating temperature ..... 0 to 55 °C

Storage temperature ..... –20 to 70 °C

Humidity ..... 5 to 90% RH, noncondensing

Maximum altitude ..... 2,000 m

Pollution Degree 2

Note Clean the device with a soft, non-metallic brush. Make sure that the device is completely dry and free from contaminants before returning it to service.

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 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 cables.

CE Compliance CE

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.

Environmental Management

NI is committed to designing and manufacturing products in an environmentally responsible manner. NI recognizes that eliminating certain hazardous substances from our products is beneficial to the environment and 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 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 and Electronic Equipment, visit `ni.com/environment/weee`.

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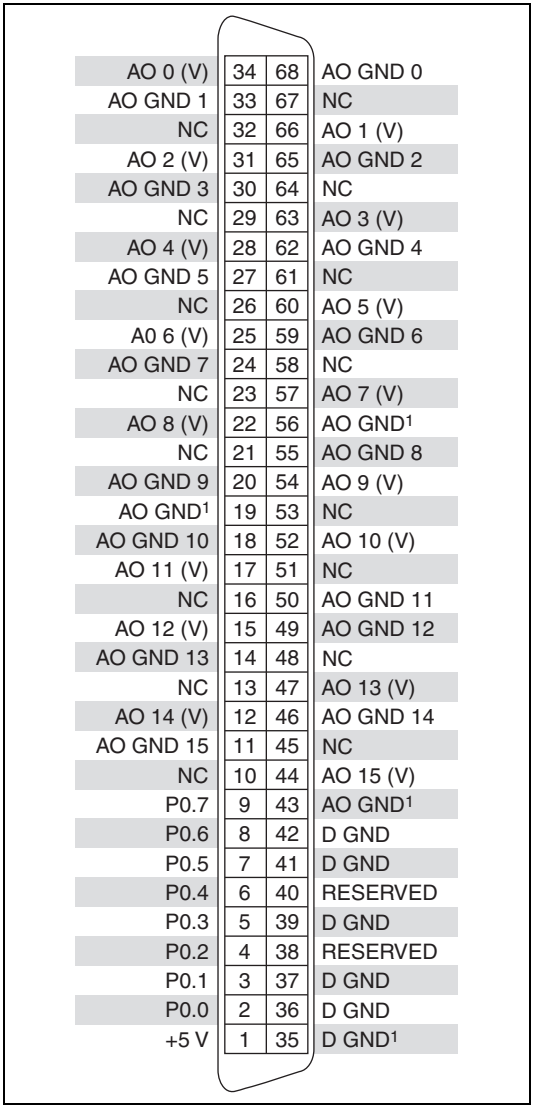
Device Pinouts

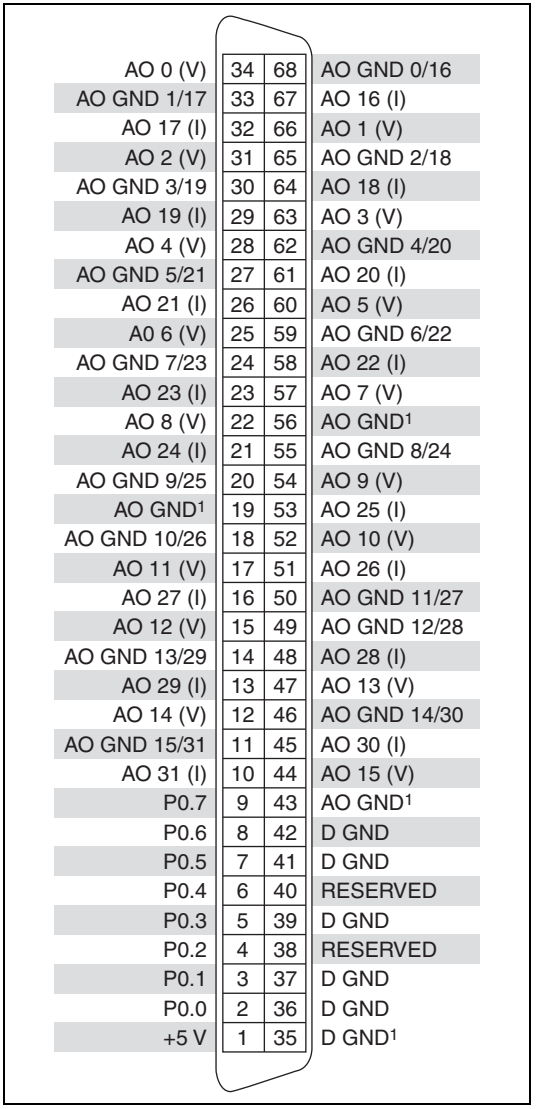


AO 0 (V)	34	68	AO GND 0
AO GND 1	33	67	NC
NC	32	66	AO 1 (V)
AO 2 (V)	31	65	AO GND 2
AO GND 3	30	64	NC
NC	29	63	AO 3 (V)
AO 4 (V)	28	62	AO GND 4
AO GND 5	27	61	NC
NC	26	60	AO 5 (V)
A0 6 (V)	25	59	AO GND 6
AO GND 7	24	58	NC
NC	23	57	AO 7 (V)
AO 8 (V)	22	56	AO GND[1]
NC	21	55	AO GND 8
AO GND 9	20	54	AO 9 (V)
AO GND[1]	19	53	NC
AO GND 10	18	52	AO 10 (V)
AO 11 (V)	17	51	NC
NC	16	50	AO GND 11
AO 12 (V)	15	49	AO GND 12
AO GND 13	14	48	NC
NC	13	47	AO 13 (V)
AO 14 (V)	12	46	AO GND 14
AO GND 15	11	45	NC
NC	10	44	AO 15 (V)
P0.7	9	43	AO GND[1]
P0.6	8	42	D GND
P0.5	7	41	D GND
P0.4	6	40	RESERVED
P0.3	5	39	D GND
P0.2	4	38	RESERVED
P0.1	3	37	D GND
P0.0	2	36	D GND
+5 V	1	35	D GND[1]

V = Voltage
I = Current
NC = No Connect

1 No Connect when using the SH68-68-D1 cable.

Figure 3. NI 6703 Connector Pin Assignments



AO 0 (V)	34	68	AO GND 0/16
AO GND 1/17	33	67	AO 16 (I)
AO 17 (I)	32	66	AO 1 (V)
AO 2 (V)	31	65	AO GND 2/18
AO GND 3/19	30	64	AO 18 (I)
AO 19 (I)	29	63	AO 3 (V)
AO 4 (V)	28	62	AO GND 4/20
AO GND 5/21	27	61	AO 20 (I)
AO 21 (I)	26	60	AO 5 (V)
A0 6 (V)	25	59	AO GND 6/22
AO GND 7/23	24	58	AO 22 (I)
AO 23 (I)	23	57	AO 7 (V)
AO 8 (V)	22	56	AO GND[1]
AO 24 (I)	21	55	AO GND 8/24
AO GND 9/25	20	54	AO 9 (V)
AO GND[1]	19	53	AO 25 (I)
AO GND 10/26	18	52	AO 10 (V)
AO 11 (V)	17	51	AO 26 (I)
AO 27 (I)	16	50	AO GND 11/27
AO 12 (V)	15	49	AO GND 12/28
AO GND 13/29	14	48	AO 28 (I)
AO 29 (I)	13	47	AO 13 (V)
AO 14 (V)	12	46	AO GND 14/30
AO GND 15/31	11	45	AO 30 (I)
AO 31 (I)	10	44	AO 15 (V)
P0.7	9	43	AO GND[1]
P0.6	8	42	D GND
P0.5	7	41	D GND
P0.4	6	40	RESERVED
P0.3	5	39	D GND
P0.2	4	38	RESERVED
P0.1	3	37	D GND
P0.0	2	36	D GND
+5 V	1	35	D GND[1]

V = Voltage
I = Current
NC = No Connect

1 No Connect when using the SH68-68-D1 cable.

Figure 4. NI 6704 Connector Pin Assignments

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