DEVICE SPECIFICATIONS

NI 6229

M Series Data Acquisition: 16-Bit, 250 kS/s, 32 AI, 48 DIO, 4 AO

The following specifications are typical at 25 °C, unless otherwise noted. For more information about the NI 6229, refer to the *M Series User Manual* available at *ni.com/manuals*.

Analog Input

Number of channels	16 differential or 32 single ended
ADC resolution	16 bits
DNL	No missing codes guaranteed
INL	Refer to the *AI Absolute Accuracy* section
Sample rate	
Single channel maximum	250 kS/s
Multichannel maximum (aggregate)	250 kS/s
Minimum	No minimum
Timing accuracy	50 ppm of sample rate
Timing resolution	50 ns
Input coupling	DC
Input range	±0.2 V, ±1 V, ±5 V, ±10 V
Maximum working voltage for analog inputs (signal + common mode)	±11 V of AI GND
CMRR (DC to 60 Hz)	92 dB
Input impedance	
Device on	
AI+ to AI GND	>10 GΩ in parallel with 100 pF
AI- to AI GND	>10 GΩ in parallel with 100 pF

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Device off

AI+ to AI GND	820 Ω
AI- to AI GND	820 Ω
Input bias current	±100 pA
Crosstalk (at 100 kHz)	
Adjacent channels	-75 dB
Non-adjacent channels	-90 dB
Small signal bandwidth (-3 dB)	700 kHz
Input FIFO size	4,095 samples
Scan list memory	4,095 entries
Data transfers	
PCI/PXI	DMA (scatter-gather), interrupts, programmed I/O
USB	USB Signal Stream, programmed I/O
Overvoltage protection for all analog input and sense channels	
Device on	±25 V for up to two AI pins
Device off	±15 V for up to two AI pins
Input current during overvoltage condition	±20 mA maximum/AI pin

Settling Time for Multichannel Measurements

Accuracy, full-scale step, all ranges

|	
±90 ppm of step (±6 LSB)	4 µs convert interval
±30 ppm of step (±2 LSB)	5 µs convert interval
±15 ppm of step (±1 LSB)	7 µs convert interval

Typical Performance Graphs

Figure 1. Settling Error versus Time for Different Source Impedances
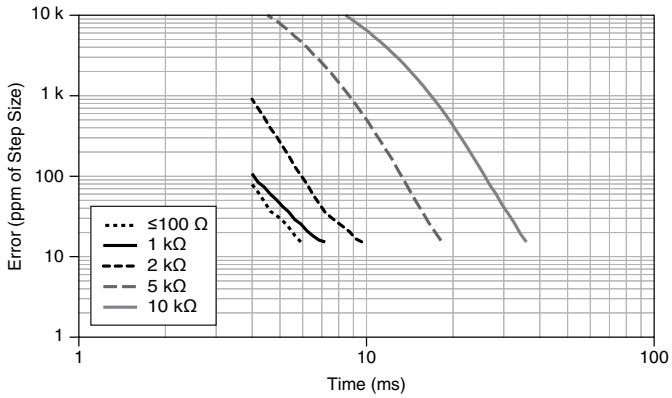
Figure 2. AI Small Signal Bandwidth
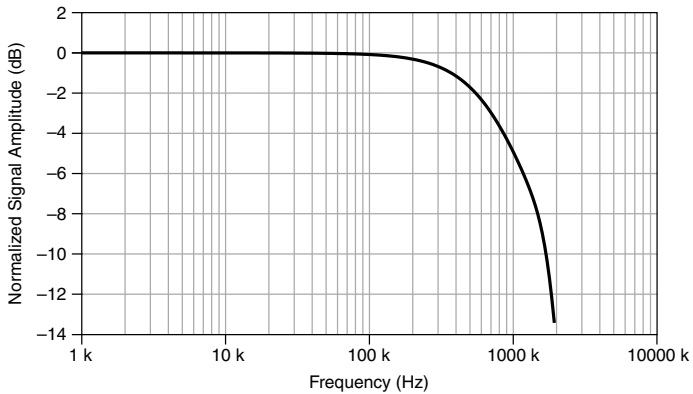
Figure 3. AI CMRR
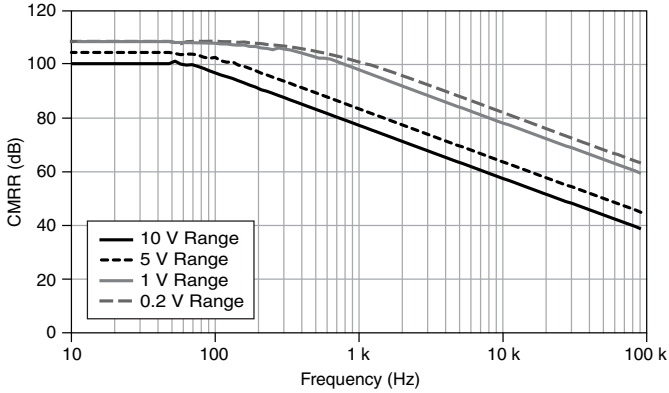
AI Absolute Accuracy

Note Accuracies listed are valid for up to one year from the device external calibration.

Table 1. AI Absolute Accuracy

Nominal Range Positive Full Scale	Nominal Range Negative Full Scale	Residual Gain Error (ppm of Reading)	Residual Offset Error (ppm of Range)	Offset Tempco (ppm of Range/°C)	Random Noise, σ (μVrms)	Absolute Accuracy at Full Scale (μV)	Sensitivity (μV)
10	-10	75	20	57	244	3,100	97.6
5	-5	85	20	60	122	1,620	48.8
1	-1	95	25	79	30	360	12.0
0.2	-0.2	135	80	175	13	112	5.2

Note Sensitivity is the smallest voltage change that can be detected. It is a function of noise.

Gain tempco	25 ppm/°C
Reference tempco	5 ppm/°C
INL error	76 ppm of range

AI Absolute Accuracy Equation

AbsoluteAccuracy = Reading · (GainError) + Range · (OffsetError) + NoiseUncertainty

> *GainError = ResidualAIGainError + GainTempco · (TempChangeFromLastInternalCal) + ReferenceTempco · (TempChangeFromLastExternalCal)*

> *OffsetError = ResidualAIOffsetError + OffsetTempco · (TempChangeFromLastInternalCal) + INLError*

> $NoiseUncertainty = \dfrac{Random\ Noise \cdot 3}{\sqrt{100}}$ for a coverage factor of 3 σ and averaging 100 points.

AI Absolute Accuracy Example

Absolute accuracy at full scale on the analog input channels is determined using the following assumptions:

- TempChangeFromLastExternalCal = 10 °C
- TempChangeFromLastInternalCal = 1 °C
- number_of_readings = 100
- CoverageFactor = 3 σ

For example, on the 10 V range, the absolute accuracy at full scale is as follows:

> GainError = 75 ppm + 25 ppm · 1 + 5 ppm · 10 = 150 ppm

> OffsetError = 20 ppm + 57 ppm · 1 + 76 ppm = 153 ppm

> $NoiseUncertainty = \dfrac{244\ \mu V \cdot 3}{\sqrt{100}} = 73\ \mu V$

> AbsoluteAccuracy = 10 V · (GainError) + 10 V · (OffsetError) + NoiseUncertainty = 3,100 µV

Analog Output

Number of channels	4
DAC resolution	16 bits
DNL	±1 LSB
Monotonicity	16 bit guaranteed
Maximum update rate	
1 channel	833 kS/s
2 channels	740 kS/s per channel
3 channels	666 kS/s per channel
4 channels	625 kS/s per channel
Timing accuracy	50 ppm of sample rate

Timing resolution	50 ns
Output range	±10 V
Output coupling	DC
Output impedance	0.2 Ω
Output current drive	±5 mA
Overdrive protection	±25 V
Overdrive current	10 mA
Power-on state	±20 mV[1]
Power-off glitch	400 mV for 200 ms
Output FIFO size	8,191 samples shared among channels used
Data transfers	
PCI/PXI	DMA (scatter-gather), interrupts, programmed I/O
USB	USB Signal Stream, programmed I/O
AO waveform modes	Non-periodic waveform, periodic waveform regeneration mode from onboard FIFO, periodic waveform regeneration from host buffer including dynamic update
Settling time, full-scale step, 15 ppm (1 LSB)	6 µs
Slew rate	15 V/µs
Glitch energy	
Magnitude	100 mV
Duration	2.6 µs

AO Absolute Accuracy

Absolute accuracy at full-scale numbers is valid immediately following internal calibration and assumes the device is operating within 10 °C of the last external calibration.

📝 **Note** Accuracies listed are valid for up to one year from the device external calibration.

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[1] When the USB Screw Terminal device is powered on, the analog output signal is not defined until after USB configuration is complete.

Table 2. AO Absolute Accuracy

Nominal Range Positive Full Scale	Nominal Range Negative Full Scale	Residual Gain Error (ppm of Reading)	Gain Tempco (ppm/°C)	Residual Offset Error (ppm of Range)	Offset Tempco (ppm of Range/°C)	Absolute Accuracy at Full Scale (µV)
10	-10	90	10	40	5	3,230

Reference tempco	5 ppm/°C
INL error	128 ppm of range

AO Absolute Accuracy Equation

AbsoluteAccuracy = OutputValue · (GainError) + Range · (OffsetError)

> *GainError = ResidualGainError + GainTempco · (TempChangeFromLastInternalCal) + ReferenceTempco · (TempChangeFromLastExternalCal)*
>
> *OffsetError = ResidualOffsetError + AOOffsetTempco · (TempChangeFromLastInternalCal) + INLError*

Digital I/O/PFI

Static Characteristics

Number of channels	48 total, 32 (P0.<0..31>), 16 (PFI <0..7>/P1, PFI <8..15>/P2)
Ground reference	D GND
Direction control	Each terminal individually programmable as input or output
Pull-down resistor	50 kΩ typical, 20 kΩ minimum
Input voltage protection	±20 V on up to two pins[2]

Waveform Characteristics (Port 0 Only)

Terminals used	Port 0 (P0.<0..31>)
Port/sample size	Up to 32 bits
Waveform generation (DO) FIFO	2,047 samples
Waveform acquisition (DI) FIFO	2,047 samples

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[2] Stresses beyond those listed under *Input voltage protection* may cause permanent damage to the device.

DI or DO Sample Clock frequency	0 MHz to 1 MHz, system and bus activity dependent
Data transfers	
PCI/PXI	DMA (scatter-gather), interrupts, programmed I/O
USB	USB Signal Stream, programmed I/O
DI or DO Sample Clock source[3]	Any PFI, RTSI, AI Sample or Convert Clock, AO Sample Clock, Ctr *n* Internal Output, and many other signals

PFI/Port 1/Port 2 Functionality

Functionality	Static digital input, static digital output, timing input, timing output
Timing output sources	Many AI, AO, counter, DI, DO timing signals
Debounce filter settings	125 ns, 6.425 µs, 2.56 ms, disable; high and low transitions; selectable per input

Recommended Operating Conditions

Table 3. PCI/PXI

Level	Minimum	Maximum
Input high voltage (V_{IH})	2.2 V	5.25 V
Input low voltage (V_{IL})	0 V	0.8 V
Output high current (I_{OH}) P0.<0..31>	—	-24 mA
Output high current (I_{OH}) PFI <0..15>/P1/P2	—	-16 mA
Output low current (I_{OL}) P0.<0..31>	—	24 mA
Output low current (I_{OL}) PFI <0..15>/P1/P2	-—	16 mA

Table 4. USB Devices

Level	Minimum	Maximum
Input high voltage (V_{IH})	2.2 V	5.25 V
Input low voltage (V_{IL})	0 V	0.8 V

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[3] The digital subsystem does not have its own dedicated internal timing engine. Therefore, a sample clock must be provided from another subsystem on the device or an external source.

Table 4. USB Devices (Continued)

Level	Minimum	Maximum
Output high current (I_{OH}) P0.<0..15>	—	-24 mA
Output high current (I_{OH}) P0.<16..31>	—	-16 mA
Output high current (I_{OH}) PFI <0..15>/P1/P2	—	-16 mA
Output low current (I_{OL}) P0.<0..15>	—	24 mA
Output low current (I_{OL}) P0.<16..31>	—	16 mA
Output low current (I_{OL}) PFI <0..15>/P1/P2	—	16 mA

Electrical Characteristics

| Level	Minimum	Maximum
Positive-going threshold (VT+)	—	2.2 V
Negative-going threshold (VT-)	0.8 V	—
Delta VT hystersis (VT+ - VT-)	0.2 V	—
I_{IL} input low current ($V_{in} = 0$ V)	—	-10 µA
I_{IH} input high current ($V_{in} = 5$ V)	—	250 µA

Digital I/O Characteristics

Figure 4. DIO Port 0: I_{oh} versus V_{oh}
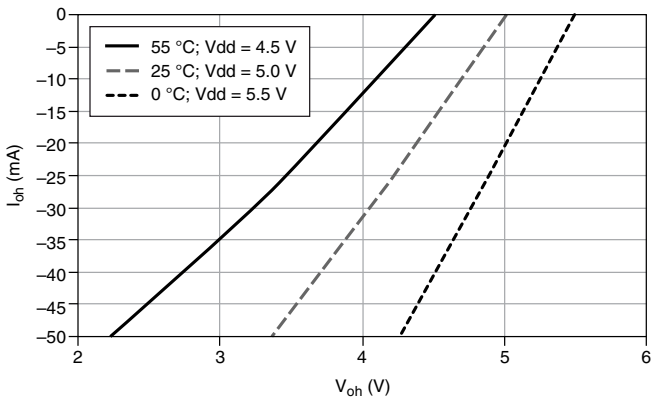
Figure 5. DIO PFI/Port 1/Port 2: I_{oh} versus V_{oh}
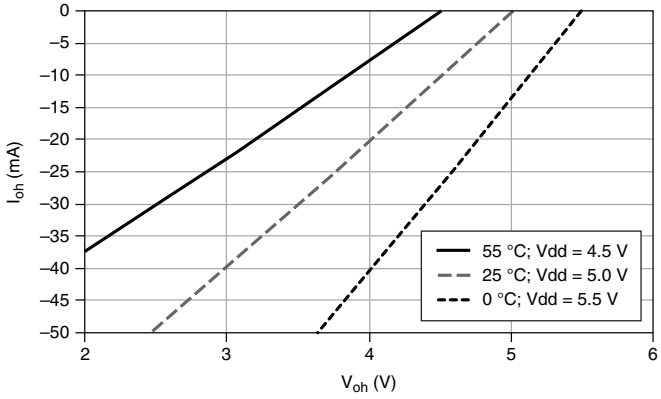
Figure 6. DIO Port 0: I_{ol} versus V_{ol}
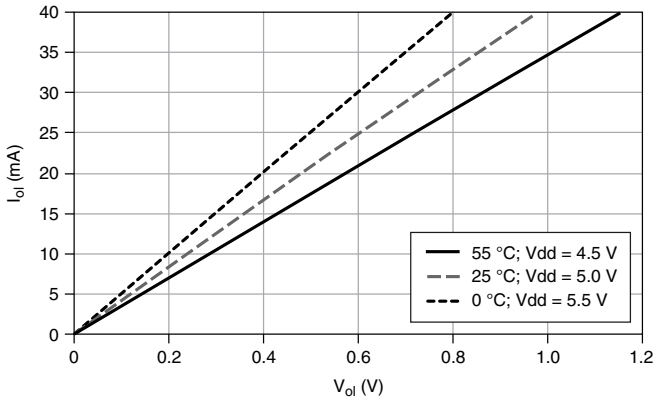
Figure 7. DIO PFI/Port 1/Port 2: I_{ol} versus V_{ol}
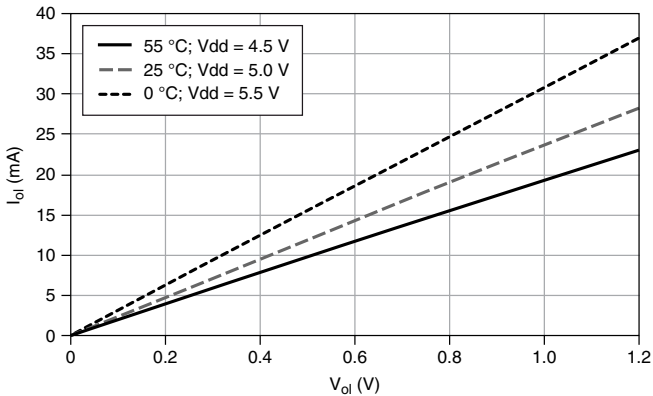
General-Purpose Counters/Timers

Number of counter/timers	2
Resolution	32 bits
Counter measurements	Edge counting, pulse, semi-period, period, two-edge separation
Position measurements	X1, X2, X4 quadrature encoding with Channel Z reloading; two-pulse encoding
Output applications	Pulse, pulse train with dynamic updates, frequency division, equivalent time sampling
Internal base clocks	80 MHz, 20 MHz, 0.1 MHz
External base clock frequency	0 MHz to 20 MHz
Base clock accuracy	50 ppm
Inputs	Gate, Source, HW_Arm, Aux, A, B, Z, Up_Down
Routing options for inputs	Any PFI, RTSI, PXI_TRIG, PXI_STAR, analog trigger, many internal signals
FIFO	2 samples
Data transfers	
PCI/PXI	Dedicated scatter-gather DMA controller for each counter/timer; interrupts, programmed I/O
USB	USB Signal Stream, programmed I/O

Frequency Generator

Number of channels	1
Base clocks	10 MHz, 100 kHz
Divisors	1 to 16
Base clock accuracy	50 ppm

Output can be available on any output PFI or RTSI terminal.

Phase-Locked Loop (PLL)

Note PCI/PXI devices only.

Number of PLLs	1
Reference signal	PXI_STAR, PXI_CLK10, RTSI <0..7>
Output of PLL	80 MHz Timebase; other signals derived from 80 MHz Timebase including 20 MHz and 100 kHz Timebases

External Digital Triggers

Source	Any PFI, RTSI, PXI_TRIG, PXI_STAR
Polarity	Software-selectable for most signals
Analog input function	Start Trigger, Reference Trigger, Pause Trigger, Sample Clock, Convert Clock, Sample Clock Timebase
Analog output function	Start Trigger, Pause Trigger, Sample Clock, Sample Clock Timebase
Counter/timer function	Gate, Source, HW_Arm, Aux, A, B, Z, Up_Down
Digital waveform generation (DO) function	Sample Clock
Digital waveform acquisition (DI) function	Sample Clock

Device-to-Device Trigger Bus

PCI	RTSI <0..7>[4]
PXI	PXI_TRIG <0..7>, PXI_STAR
USB source	None
Output selections	10 MHz Clock, frequency generator output, many internal signals
Debounce filter settings	125 ns, 6.425 μs, 2.56 ms, disable; high and low transitions; selectable per input

Bus Interface

PCI/PXI	3.3 V or 5 V signal environment
USB	USB 2.0 Hi-Speed or full-speed[5, 6]
DMA channels (PCI/PXI)	6, can be used for analog input, analog output, digital input, digital output, counter/timer 0, counter/timer 1
USB Signal Stream	4, can be used for analog input, analog output, counter/timer 0, counter/timer 1

The PXI device supports one of the following features:

- May be installed in PXI Express hybrid slots
- Or, may be used to control SCXI in PXI/SCXI combo chassis

Table 5. PXI/SCXI Combo and PXI Express Chassis Compatibility

M Series Part Number	SCXI Control in PXI/SCXI Combo Chassis	PXI Express Hybrid Slot Compatible
191332B-01	No	Yes
191332B-11	Yes	No
191322A-0x	Yes	No

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[4] In other sections of this document, RTSI refers to RTSI <0..7> for the PCI devices or PXI_TRIG <0..7> for PXI devices.

[5] If you are using an USB M Series device in full-speed mode, device performance will be lower and you will not be able to achieve maximum sample/update rates.

[6] Operating on a full-speed bus may result in lower performance.

Power Requirements

Current draw from bus during no-load condition[7]

+5 V	0.02 A
+3.3 V	0.25 A
+12 V	0.15 A

Current draw from bus during AI and AO overvoltage condition[7]

+5 V	0.02 A
+3.3 V	0.25 A
+12 V	0.25 A

⚠ **Caution** USB devices must be powered with an NI offered AC adapter or a National Electric Code (NEC) Class 2 DC source that meets the power requirements for the device and has appropriate safety certification marks for country of use.

USB power supply requirements	11 to 30 VDC, 20 W, locking or non-locking power jack with 0.080 in. diameter center pin, 5/16-32 thread for locking collars

Current Limits

⚠ **Caution** Exceeding the current limits may cause unpredictable behavior by the device and/or PC/chassis.

PCI

+5 V terminal (connector 0)	1 A maximum[8]
+5 V terminal (connector 1)	1 A maximum[8]

PXI

+5 V terminal (connector 0)	1 A maximum[8]
+5 V terminal (connector 1)	1 A maximum[8]
P0/PFI/P1/P2 and +5 V terminals combined	2 A maximum

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[7] Does not include P0/PFI/P1/P2 and +5 V terminals.
[8] Older revisions have a self-resetting fuse that opens when current exceeds this specification. Newer revisions have a traditional fuse that opens when current exceeds this specification. This fuse is not customer-replaceable; if the fuse permanently opens, return the device to NI for repair.

USB

+5 V terminal	1 A maximum[8]
P0/PFI/P1/P2 and +5 V terminals combined	2 A maximum
Power supply fuse	2 A, 250 V

Physical Characteristics

Dimensions

PCI printed circuit board	10.6 cm × 15.5 cm (4.2 in. × 6.1 in.)
PXI printed circuit board	Standard 3U PXI
USB Screw Terminal enclosure (includes connectors)	26.67 cm × 17.09 cm × 4.45 cm (10.5 in. × 6.73 in. × 1.75 in.)
USB BNC enclosure (includes connectors)	28.6 cm × 17 cm × 6.9 cm (11.25 in. × 6.7 in. × 2.7 in.)
USB OEM	Refer to the *NI USB-622x/625x/628x OEM User Guide*

Weight

PCI	101 g (3.5 oz)
PXI	171 g (6.0 oz)
USB Screw Terminal	1.24 kg (2 lb 11 oz)
USB OEM	162 g (5.7 oz)

I/O connectors

PCI/PXI	2 68-pin VHDCI
USB Screw Terminal	128 screw terminals
USB BNC	30 BNCs and 60 screw terminals
USB Screw Terminal/BNC screw terminal wiring	16 to 28 AWG

Calibration

Recommended warm-up time

PCI/PXI	15 minutes
USB	30 minutes
Calibration interval	1 year

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. 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 for measurements within Categories II, III, or IV.

📝 **Note** Measurement Categories CAT I and CAT O (Other) are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Environmental

Operating temperature	
PCI/PXI	0 ºC to 55 ºC
USB	0 ºC to 45 ºC
Storage temperature	-20 ºC to 70 ºC
Humidity	10% RH to 90% RH, noncondensing
Maximum altitude	2,000 m
Pollution Degree (indoor use only)	2

Indoor use only.

Shock and Vibration (PXI 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 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.)

Safety

This product is designed to meet the requirements of the following electrical equipment safety standards 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 61326-1 (IEC 61326-1): Class A emissions; Basic immunity
- EN 55011 (CISPR 11): Group 1, Class A emissions
- EN 55022 (CISPR 22): Class A emissions
- EN 55024 (CISPR 24): Immunity
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

Note In the United States (per FCC 47 CFR), Class A equipment is intended for use in commercial, light-industrial, and heavy-industrial locations. In Europe, Canada, Australia and New Zealand (per CISPR 11) Class A equipment is intended for use only in heavy-industrial locations.

Note Group 1 equipment (per CISPR 11) is any industrial, scientific, or medical equipment that does not intentionally generate radio frequency energy for the treatment of material or inspection/analysis purposes.

Note For EMC declarations and certifications, and additional information, refer to the *Online Product Certification* section.

CE Compliance $C\epsilon$

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

- 2014/35/EU; Low-Voltage Directive (safety)
- 2014/30/EU; Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU; Restriction of Hazardous Substances (RoHS)

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 *Minimize Our Environmental Impact* 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 NI products must be disposed of according to local laws and regulations. For more information about how to recycle NI products in your region, visit *ni.com/environment/weee*.

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.）

Device Pinouts

Figure 8. NI PCI/PXI-6229 Pinout

CONNECTOR 0 (AI 0-15)

Signal	Pin	Pin	Signal
AI 0	68	34	AI 8
AI GND	67	33	AI 1
AI 9	66	32	AI GND
AI 2	65	31	AI 10
AI GND	64	30	AI 3
AI 11	63	29	AI GND
AI SENSE	62	28	AI 4
AI 12	61	27	AI GND
AI 5	60	26	AI 13
AI GND	59	25	AI 6
AI 14	58	24	AI GND
AI 7	57	23	AI 15
AI GND	56	22	AO 0
AO GND	55	21	AO 1
AO GND	54	20	NC
D GND	53	19	P0.4
P0.0	52	18	D GND
P0.5	51	17	P0.1
D GND	50	16	P0.6
P0.2	49	15	D GND
P0.7	48	14	+5 V
P0.3	47	13	D GND
PFI 11/P2.3	46	12	D GND
PFI 10/P2.2	45	11	PFI 0/P1.0
D GND	44	10	PFI 1/P1.1
PFI 2/P1.2	43	9	D GND
PFI 3/P1.3	42	8	+5 V
PFI 4/P1.4	41	7	D GND
PFI 13/P2.5	40	6	PFI 5/P1.5
PFI 15/P2.7	39	5	PFI 6/P1.6
PFI 7/P1.7	38	4	D GND
PFI 8/P2.0	37	3	PFI 9/P2.1
D GND	36	2	PFI 12/P2.4
D GND	35	1	PFI 14/P2.6

TERMINAL 68 / TERMINAL 34 / TERMINAL 1 / TERMINAL 35

NC = No Connect

CONNECTOR 1 (AI 16-31)

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

TERMINAL 35 / TERMINAL 1 / TERMINAL 34 / TERMINAL 68

NC = No Connect

Figure 9. NI USB-6229 Screw Terminal Pinout

AI 0	1		17	AI 4	
AI 8	2		18	AI 12	
AI GND	3		19	AI GND	
AI 1	4		20	AI 5	
AI 9	5		21	AI 13	
AI GND	6		22	AI GND	
AI 2	7		23	AI 6	
AI 10	8		24	AI 14	
AI GND	9		25	AI GND	
AI 3	10		26	AI 7	
AI 11	11		27	AI 15	
AI GND	12		28	AI GND	
AI SENSE	13		29	NC	
AI GND	14		30	AI GND	
AO 0	15		31	AO 1	
AO GND	16		32	AO GND	

AI 16	33		49	AI 20	
AI 24	34		50	AI 28	
AI GND	35		51	AI GND	
AI 17	36		52	AI 21	
AI 25	37		53	AI 29	
AI GND	38		54	AI GND	
AI 18	39		55	AI 22	
AI 26	40		56	AI 30	
AI GND	41		57	AI GND	
AI 19	42		58	AI 23	
AI 27	43		59	AI 31	
AI GND	44		60	AI GND	
AI SENSE 2	45		61	NC	
AI GND	46		62	AI GND	
AO 2	47		63	AO 3	
AO GND	48		64	AO GND	

P0.0	65		81	PFI 8/P2.0	
P0.1	66		82	D GND	
P0.2	67		83	PFI 9/P2.1	
P0.3	68		84	D GND	
P0.4	69		85	PFI 10/P2.2	
P0.5	70		86	D GND	
P0.6	71		87	PFI 11/P2.3	
P0.7	72		88	D GND	
PFI 0/P1.0	73		89	PFI 12/P2.4	
PFI 1/P1.1	74		90	D GND	
PFI 2/P1.2	75		91	PFI 13/P2.5	
PFI 3/P1.3	76		92	D GND	
PFI 4/P1.4	77		93	PFI 14/P2.6	
PFI 5/P1.5	78		94	D GND	
PFI 6/P1.6	79		95	PFI 15/P2.7	
PFI 7/P1.7	80		96	+5 V	

P0.8	97		113	P0.24	
P0.9	98		114	D GND	
P0.10	99		115	P0.25	
P0.11	100		116	D GND	
P0.12	101		117	P0.26	
P0.13	102		118	D GND	
P0.14	103		119	P0.27	
P0.15	104		120	D GND	
P0.16	105		121	P0.28	
P0.17	106		122	D GND	
P0.18	107		123	P0.29	
P0.19	108		124	D GND	
P0.20	109		125	P0.30	
P0.21	110		126	D GND	
P0.22	111		127	P0.31	
P0.23	112		128	D GND	

NC = No Connect

NC = No Connect

Figure 10. NI USB-6229 BNC Top Panel and Pinout