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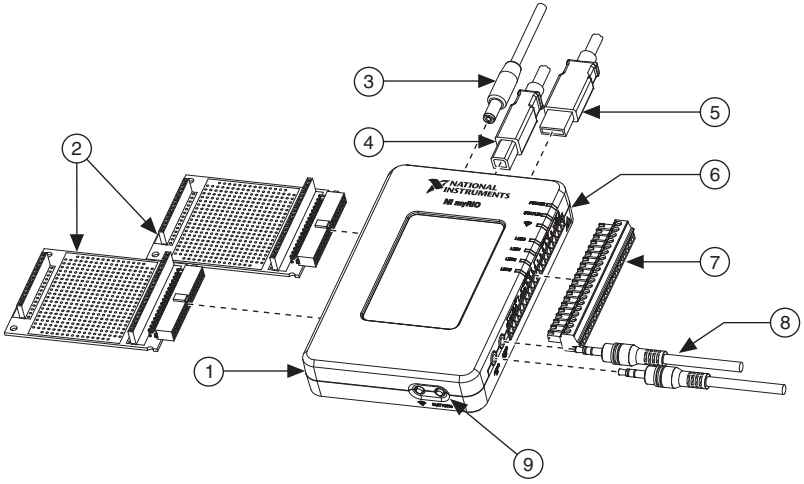
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USER GUIDE AND SPECIFICATIONS

NI myRIO-1900

The National Instruments myRIO-1900 is a portable reconfigurable I/O (RIO) device that students can use to design control, robotics, and mechatronics systems. This document contains pinouts, connectivity information, dimensions, mounting instructions, and specifications for the NI myRIO-1900.

Figure 1. NI myRIO-1900



1 NI myRIO-1900
2 myRIO Expansion Port (MXP) Breakouts (One Included in Kit)
3 Power Input Cable
4 USB Device Cable
5 USB Host Cable (Not Included in Kit)
6 LEDs
7 Mini System Port (MSP) Screw-Terminal Connector
8 Audio In/Out Cables (One Included in Kit)
9 Button0

NATIONAL INSTRUMENTS

Safety Information

Caution Do not operate the hardware in a manner not specified in this document and in the user documentation. Misuse of the hardware can result in a hazard. You can compromise the safety protection if the hardware is damaged in any way. If the hardware is damaged, return it to National Instruments for repair.

Clean the hardware with a soft, nonmetallic brush. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in commercial locations. There is no guarantee that harmful interference will not occur in a particular installation or when the product is connected to a test object. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

Caution This product was tested for EMC compliance using myRIO application software. The maximum length for USB cables is 2.0 m (6.6 ft), and the maximum length for signal wires is 30.0 cm (11.8 in.).

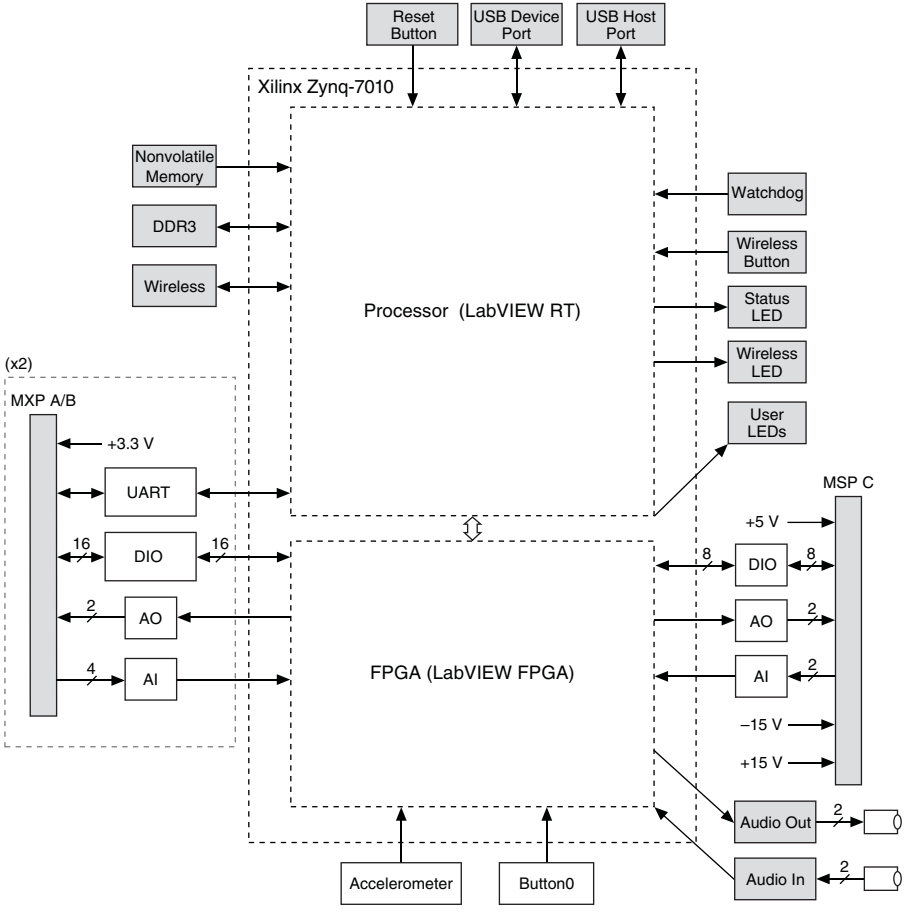
Caution The mounting keyholes on the back of the NI myRIO-1900 are sensitive to electrostatic discharge (ESD). When handling the device, be careful not to touch inside the keyholes.

Hardware Overview

The NI myRIO-1900 provides analog input (AI), analog output (AO), digital input and output (DIO), audio, and power output in a compact embedded device. The NI myRIO-1900 connects to a host computer over USB and wireless 802.11b,g,n.

The following figure shows the arrangement and functions of NI myRIO-1900 components.

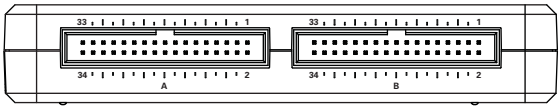
Figure 2. NI myRIO-1900 Hardware Block Diagram



Connector Pinouts

NI myRIO-1900 Expansion Port (MXP) connectors A and B carry identical sets of signals. The signals are distinguished in software by the connector name, as in `ConnectorA/DIO1` and `ConnectorB/DIO1`. Refer to the software documentation for information about configuring and using signals. The following figure and table show the signals on MXP connectors A and B. Note that some pins carry secondary functions as well as primary functions.

Figure 3. Primary/Secondary Signals on MXP Connectors A and B



+3.3 V	DIO10 / PWM2	DIO9 / PWM1	DIO8 / PWM0	DIO7 / SPI.MOSI	DIO6 / SPI.MISO	DIO5 / SPI.CLK	DIO4	DIO3	DIO2	DIO1	DIO0	AI3	AI2	AI1	AI0	+5V
33	31	29	27	25	23	21	19	17	15	13	11	9	7	5	3	1
34	32	30	28	26	24	22	20	18	16	14	12	10	8	6	4	2
DIO15 / I2C.SDA	DIO14 / I2C.SCL	DGND	DGND	DIO13	DGND	DIO12 / ENC.B	DGND	DIO11 / ENC.A	DGND	UART.TX	DGND	UART.RX	DGND	AGND	AO1	AO0

Table 1. Descriptions of Signals on MXP Connectors A and B

Signal Name	Reference	Direction	Description
+5V	DGND	Output	+5 V power output.
AI <0..3>	AGND	Input	0-5 V, referenced, single-ended analog input channels. Refer to the *Analog Input Channels* section for more information.
AO <0..1>	AGND	Output	0-5 V referenced, single-ended analog output. Refer to the *Analog Output Channels* section for more information.
AGND	N/A	N/A	Reference for analog input and output.
+3.3V	DGND	Output	+3.3 V power output.
DIO <0..15>	DGND	Input or Output	General-purpose digital lines with 3.3 V output, 3.3 V/5 V-compatible input. Refer to the *DIO Lines* section for more information.
UART.RX	DGND	Input	UART receive input. UART lines are electrically identical to DIO lines.
UART.TX	DGND	Output	UART transmit output. UART lines are electrically identical to DIO lines.
DGND	N/A	N/A	Reference for digital signals, +5 V, and +3.3 V.

The following figure and table show the signals on Mini System Port (MSP) connector C. Note that some pins carry secondary functions as well as primary functions.

Figure 4. Primary/Secondary Signals on MSP Connector C

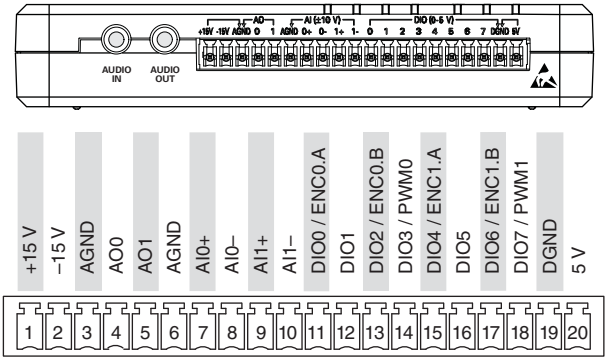


Table 2. Descriptions of Signals on MSP Connector C

Signal Name	Reference	Direction	Description
+15V/-15V	AGND	Output	+15 V/-15 V power output.
AI0+/AI0-; AI1+/AI1-	AGND	Input	±10 V, differential analog input channels. Refer to the *Analog Input Channels* section for more information.
AO <0..1>	AGND	Output	±10 V referenced, single-ended analog output channels. Refer to the *Analog Output Channels* section for more information.
AGND	N/A	N/A	Reference for analog input and output and +15 V/-15 V power output.
+5V	DGND	Output	+5 V power output.
DIO <0..7>	DGND	Input or Output	General-purpose digital lines with 3.3 V output, 3.3 V/5 V-compatible input. Refer to the *DIO Lines* section for more information.
DGND	N/A	N/A	Reference for digital lines and +5 V power output.

Table 3. Descriptions of Signals on Audio Connectors

Signal Name	Reference	Direction	Description
AUDIO IN	N/A	Input	Left and right audio inputs on stereo connector.
AUDIO OUT	N/A	Output	Left and right audio outputs on stereo connector.

Analog Input Channels

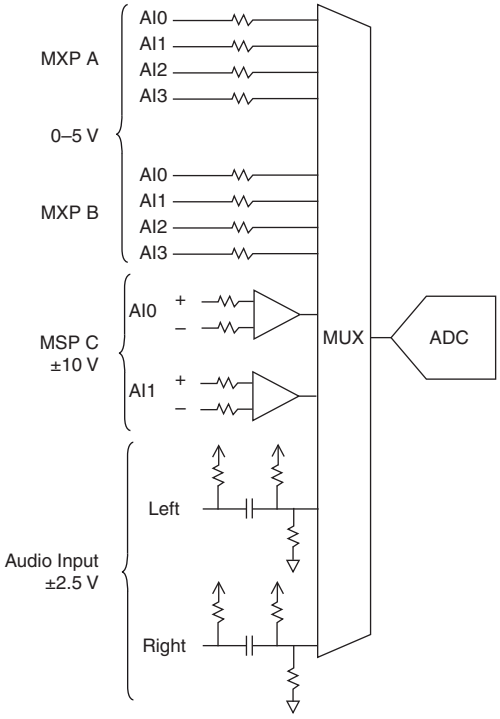
The NI myRIO-1900 has analog input channels on myRIO Expansion Port (MXP) connectors A and B, Mini System Port (MSP) connector C, and a stereo audio input connector. The analog inputs are multiplexed to a single analog-to-digital converter (ADC) that samples all channels.

MXP connectors A and B have four single-ended analog input channels per connector, AI0-AI3, which you can use to measure 0-5 V signals. MSP connector C has two high-impedance, differential analog input channels, AI0 and AI1, which you can use to measure signals up to ±10 V. The audio inputs are left and right stereo line-level inputs with a ±2.5 V full-scale range.

Note For important information about improving measurement accuracy by reducing noise, go to `ni.com/info` and enter the Info Code `analogwiring`.

Figure 5 shows the analog input topology of the NI myRIO-1900.

Figure 5. NI myRIO-1900 Analog Input Circuitry



Analog Output Channels

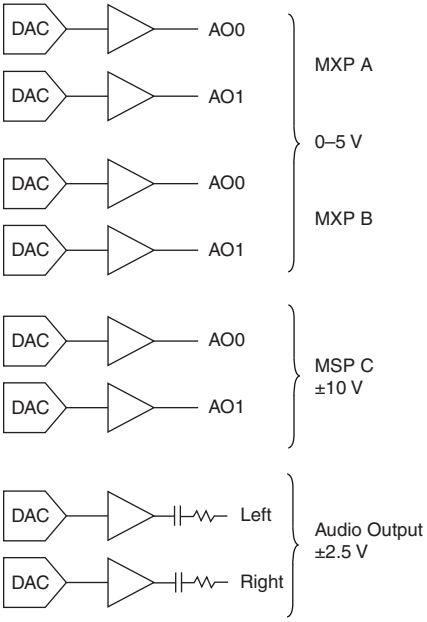
The NI myRIO-1900 has analog output channels on myRIO Expansion Port (MXP) connectors A and B, Mini System Port (MSP) connector C, and a stereo audio output connector. Each analog output channel has a dedicated digital-to-analog converter (DAC), so they can all update simultaneously. The DACs for the analog output channels are controlled by two serial communication buses from the FPGA. MXP connectors A and B share one bus, and MSP connector C and the audio outputs share a second bus. Therefore, the maximum update rate is specified as an aggregate figure in the *Analog Output* section of the *Specifications*.

MXP connectors A and B have two analog output channels per connector, AO0 and AO1, which you can use to generate 0-5 V signals. MSP connector C has two analog output channels, AO0 and AO1, which you can use to generate signals up to ±10 V. The audio outputs are left and right stereo line-level outputs capable of driving headphones.

Caution Before using headphones to listen to the audio output of the NI myRIO-1900, ensure that the audio output is at a safe level. Listening to audio signals at a high volume may result in permanent hearing loss.

Figure 6 shows the analog output topology of the NI myRIO-1900.

Figure 6. NI myRIO-1900 Analog Output Circuitry



Accelerometer

The NI myRIO-1900 contains a three-axis accelerometer. The accelerometer samples each axis continuously and updates a readable register with the result. Refer to the *Accelerometer* section of the *Specifications* for the accelerometer sample rates.

Converting Raw Data Values to Voltage

You can use the following equations to convert raw data values to volts:

$$V = Raw\ Data\ Value * LSB\ Weight$$

$$LSB\ Weight = Nominal\ Range \div 2^{ADC\ Resolution}$$

where *Raw Data Value* is the value returned by the FPGA I/O Node,

LSB Weight is the value in volts of the increment between data values,

Nominal Range is the absolute value in volts of the full, peak-to-peak nominal range of the channel,

and *ADC Resolution* is the resolution of the ADC in bits. (*ADC Resolution* = 12)

- For AI and AO channels on the MXP connectors,

$$LSB\ Weight = 5\ V \div 2^{12} = 1.221\ mV$$

$$Maximum\ reading = 4095 * 1.221\ mV = 4.999\ V$$

- For AI and AO channels on the MSP connectors,

$$LSB\ Weight = 20\ V \div 2^{12} = 4.883\ mV$$

$$Maximum\ Positive\ Reading = +2047 * 4.883\ mV = 9.995\ V$$

$$Maximum\ Negative\ Reading = -2048 * 4.883\ mV = -10.000\ V$$

- For Audio In/Out,

$$LSB\ Weight = 5\ V \div 2^{12} = 1.221\ mV$$

$$Maximum\ Positive\ Reading = +2047 * 1.221\ mV = 2.499\ V$$

$$Maximum\ Negative\ Reading = -2048 * 1.221\ mV = -2.500\ V$$

- For the accelerometer,

$$LSB\ Weight = 16\ g \div 2^{12} = 3.906\ mg$$

$$Maximum\ Positive\ Reading = +2047 * 3.906\ mg = +7.996\ g$$

$$Maximum\ Negative\ Reading = -2048 * 3.906\ mg = -8.000\ g$$

DIO Lines

The NI myRIO-1900 has 3.3 V general-purpose DIO lines on the MXP and MSP connectors. MXP connectors A and B have 16 DIO lines per connector. On the MXP connectors, each DIO line from 0 to 13 has a 40 kΩ pullup resistor to 3.3 V, and DIO lines 14 and 15 have 2.1 kΩ pullup resistors to 3.3 V. MSP connector C has eight DIO lines. Each MSP DIO line has a 40 kΩ pulldown resistor to ground. DGND is the reference for all the DIO lines. You can program all the lines individually as inputs or outputs. Secondary digital functions include Serial Peripheral

Interface Bus (SPI), I2C, pulse-width modulation (PWM), and quadrature encoder input. Refer to the NI myRIO software documentation for information about configuring the DIO lines.

Figure 7. DIO Lines <13..0> on MXP Connector A or B

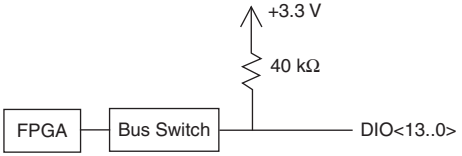


Figure 8. DIO Lines <15..14> on MXP Connector A or B

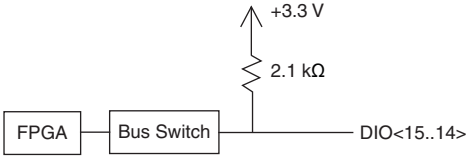
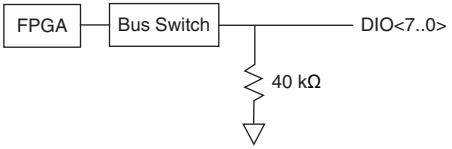


Figure 9. DIO Lines <7..0> on MSP Connector C



When a DIO line is floating, it floats in the direction of the pull resistor. A DIO line may be floating in any of the following conditions:

- when the myRIO device is starting up
- when the line is configured as an input
- when the myRIO device is powering down

You can add a stronger resistor to a DIO line to cause it to float in the opposite direction.

UART Lines

The NI myRIO-1900 has one UART receive input line and one UART transmit ouput line on each MXP connector. The UART lines are electrically identical to DIO lines 0 to 13 on the MXP connectors. Like those lines, UART.RX and UART.TX have 40 kΩ pullup resistors to 3.3 V. Use LabVIEW Real-Time to read and write over the UART lines.

Using the Reset Button

Pressing and releasing the Reset button restarts the processor and the FPGA.

Pressing and holding the Reset button for 5 seconds, then releasing it, restarts the processor and the FPGA and forces the NI myRIO-1900 into safe mode. In safe mode, the NI myRIO-1900 launches only the services necessary for updating configuration and installing software.

When the NI myRIO-1900 is in safe mode, you can communicate with it by using the UART lines on MXP connector A. You need the following items to communicate with the myRIO device over UART:

- USB-to-TTL serial UART converter cable (for example, part number TTL-232RG-VSW3V3-WE from FTD Chip)
- Serial-port terminal program configured with the following settings:
  - 115,200 bits per second
  - Eight data bits
  - No parity
  - One stop bit
  - No flow control

Using the Wireless Button and LED

For information about using the Wireless button, go to `ni.com/info` and enter the Info Code `myriowirelessbutton`.

For information about using the Wireless LED, go to `ni.com/info` and enter the Info Code `myriowirelessled`.

Using Button0

Button0 produces a logic TRUE when depressed and a logic FALSE when not depressed. Button0 is not debounced.

Understanding LED Indications

Power LED

The Power LED is lit while the NI myRIO-1900 is powered on. This LED indicates that the power supply connected to the device is adequate.

Status LED

The Status LED is off during normal operation. The NI myRIO-1900 runs a power-on self test (POST) when you apply power to the device. During the POST, the Power and Status LEDs turn on. When the Status LED turns off, the POST is complete. The NI myRIO-1900 indicates specific error conditions by flashing the Status LED a certain number of times every few seconds, as shown in Table 4.

Table 4. Status LED Indications

Number of Flashes Every Few Seconds	Indication
2	The device has detected an error in its software. This usually occurs when an attempt to upgrade the software is interrupted. Reinstall software on the device.
3	The device is in safe mode.
4	The software has crashed twice without rebooting or cycling power between crashes. This usually occurs when the device runs out of memory. Review your RT VI and check the memory usage. Modify the VI as necessary to solve the memory usage issue.
Continuously flashing or solid	The device has detected an unrecoverable error. Contact National Instruments.

LEDs 0 to 3

You can use LEDs 0 to 3 to help debug your application or easily retrieve application status. Logic TRUE turns an LED on and logic FALSE turns an LED off.

Using the USB Host Port

The NI myRIO-1900 USB host port supports Web cameras that conform to the USB Video Device Class (UVC) protocol as well as machine vision cameras that conform to the USB3 Vision standard and are USB 2.0 backward compatible. The NI myRIO-1900 USB host port also supports Basler ace USB3 cameras.

The NI myRIO-1900 USB host port also supports USB Flash drives and USB-to-IDE adapters formatted with FAT16 and FAT32 file systems. LabVIEW usually maps USB devices to the `/U`, `/V`, `/W`, or `/X` drive, starting with the `/U` drive if it is available.

NI myRIO-1900 Physical Dimensions

Figure 10. NI myRIO-1900 Dimensions, Front

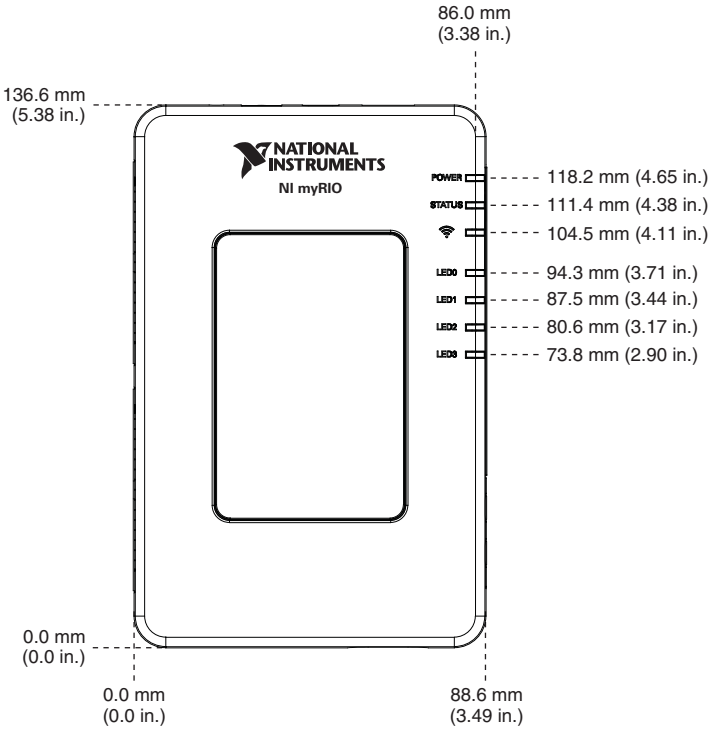


Figure 11. NI myRIO-1900 Dimensions, Back

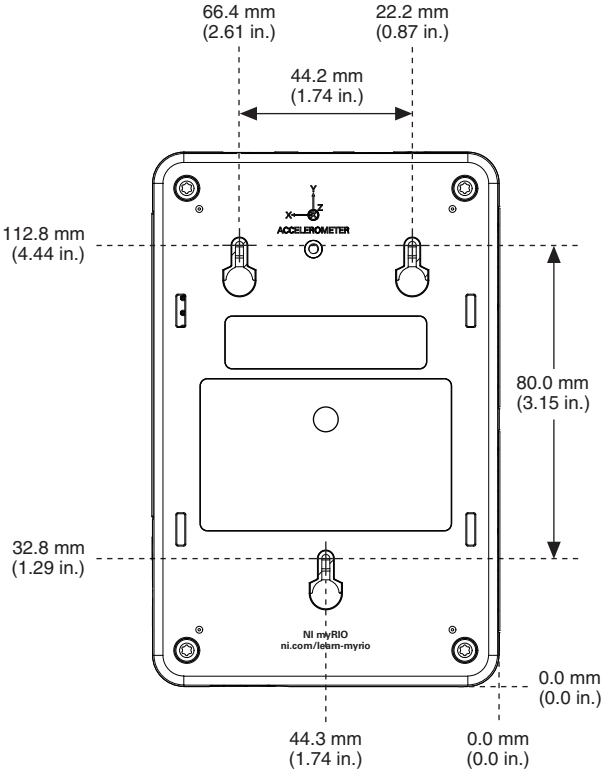
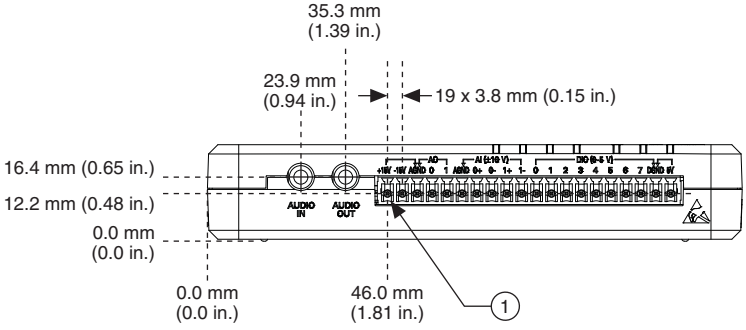
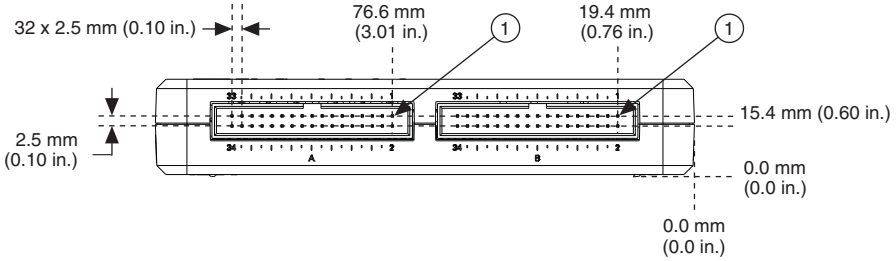


Figure 12. NI myRIO-1900 Dimensions, MSP Side



1 Pin 1

Figure 13. NI myRIO-1900 Dimensions, MXP Side



1 Pin 1

Figure 14. NI myRIO-1900 Dimensions, I/O End

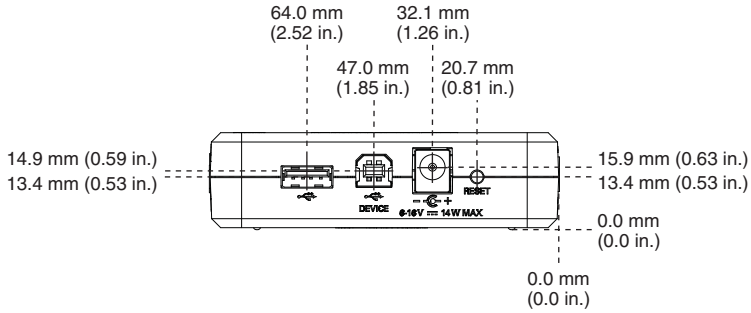
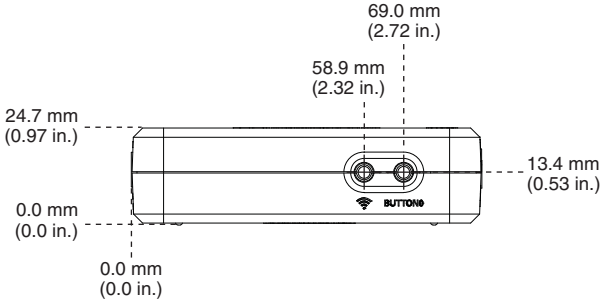


Figure 15. NI myRIO-1900 Dimensions, User End

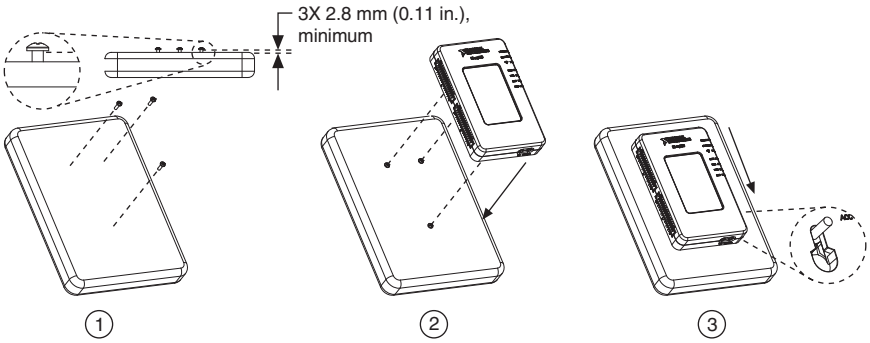


Mounting the NI myRIO-1900

Mounting the NI myRIO-1900 Using the Key Holes

You can use the provided key holes on NI myRIO-1900 to mount the device on a flat surface. Install the NI myRIO-1900 as shown in Figure 16. Use Unified #4 or ISO M3 screws to mount the NI myRIO-1900 using the key holes. Panhead screws are suitable for use with the NI myRIO-1900 key holes.

Figure 16. Mounting the NI myRIO-1900 Using the Key Holes

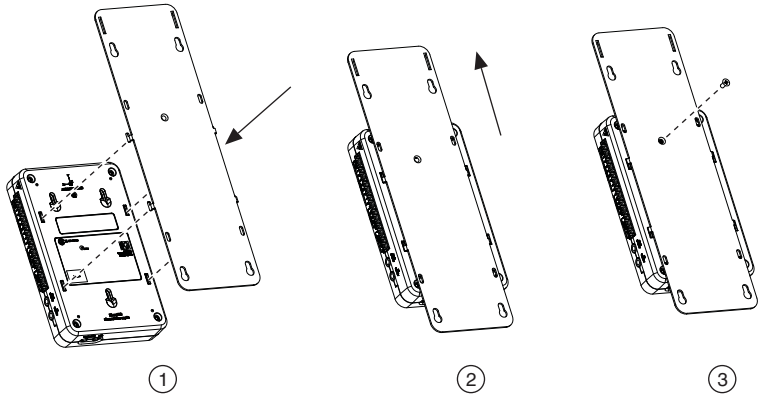


1 Install three Unified #4 or M3 screws in the flat surface using the key hole dimensions of the NI myRIO-1900 as a guide. Refer to Figure 11 for NI myRIO-1900 key hole dimensions. Leave a minimum spacing of 2.8 mm (0.11 in.) between the flat surface and the screw heads.
2 Place the NI myRIO-1900 on the screw heads.
3 Slide the NI myRIO-1900 down to secure the key holes on the screw heads.

Mounting the NI myRIO-1900 Using the Panel Mounting Kit

You can use the Panel Mounting Kit for NI myRIO-1900 to mount the device on a flat surface such as a panel or wall. Install the panel mounting kit on the NI myRIO-1900 as shown in Figure 17.

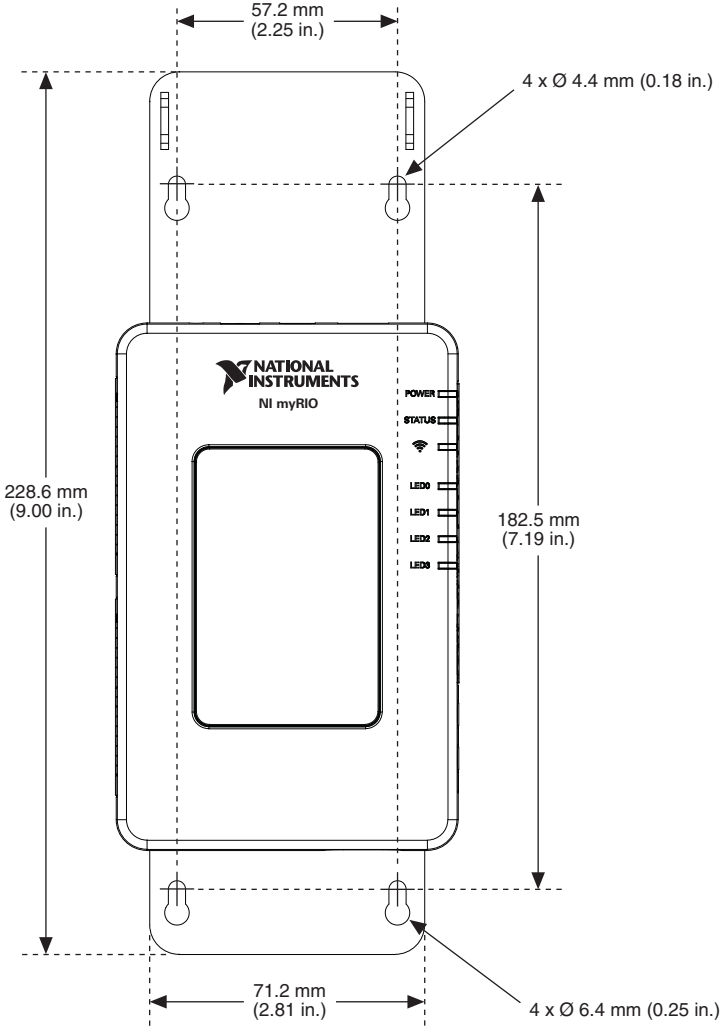
Figure 17. Installing the Panel Mounting Kit on the NI myRIO-1900



1 Place the panel on the back of the NI myRIO-1900
2 Slide the panel up to line up the screw holes on the panel and the NI myRIO-1900.
3 Secure the panel to the NI myRIO-1900. You must use the included 4-40 × 1/4 in. screw to attach the panel mounting kit to the NI myRIO-1900. Tighten the screw to 0.76 N · m (6.7 lb · in.) of torque. Do not exceed 0.87 N · m (7.7 lb · in.) of torque.

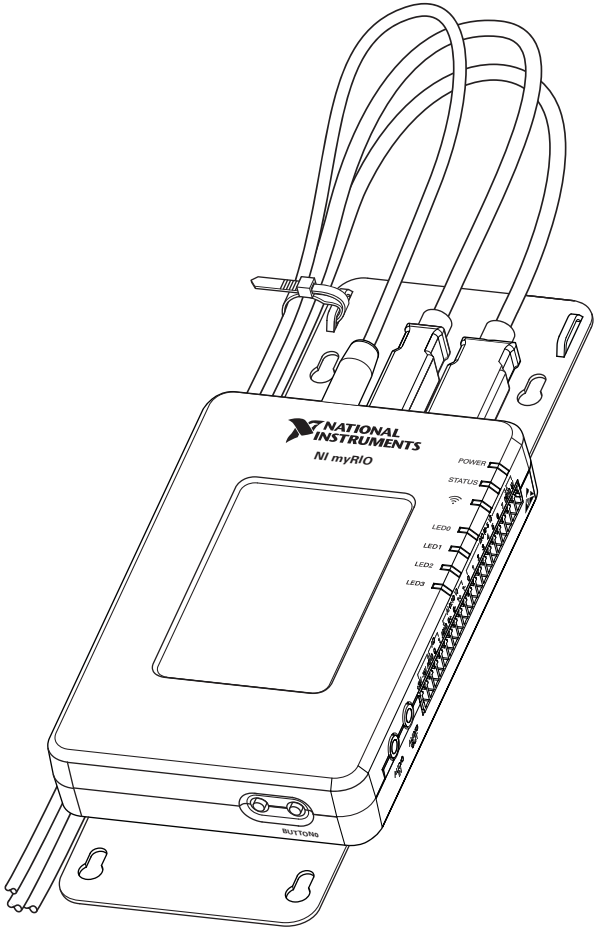
Fasten the panel mounting kit to the panel or wall using screws appropriate for the surface. The following figure shows the dimensions of the NI myRIO-1900 with the panel mounting kit installed.

Figure 18. Dimensions of NI myRIO-1900 with Panel Mounting Kit



Use a cable tie to secure the power and USB cables to the panel mounting kit as shown in Figure 19.

Figure 19. Securing the Power and USB Cables to the Panel Mounting Kit



Cables and Accessories

Table 5. Accessories Available from NI

Accessory	Description	NI Part Number
Power supply	Power supply for NI myRIO-1900	723403-01
MXP breakouts	Set of five MXP breakout boards for NI myRIO-1900	782696-01
MSP connector	MSP replacement connector plug for NI myRIO-1900	765788-01
Panel mounting kit	Panel mounting kit for NI myRIO-1900	783091-01

Specifications

The following specifications are typical for the 0 to 40 °C operating tempreature range unless otherwise noted.

Processor

Processor type ..... Xilinx Z-7010

Processor speed ..... 667 MHz

Processor cores 2

Memory

Nonvolatile memory ..... 512 MB

DDR3 memory ..... 256 MB

- DDR3 clock frequency ..... 533 MHz
- DDR3 data bus width ..... 16 bits

For information about the lifespan of the nonvolatile memory and about best practices for using nonvolatile memory, go to `ni.com/info` and enter the Info Code `SSDBP`.

FPGA

FPGA type ..... Xilinx Z-7010

Wireless Characteristics

Radio mode ..... IEEE 802.11 b,g,n

Frequency band ..... ISM 2.4 GHz

Channel width ..... 20 MHz

Channels ..... USA 1 to 11, International 1 to 13

TX power ..... +10 dBm max (10 mW)

Outdoor range ..... Up to 150 m (line of sight)

Antenna directivity ..... Omnidirectional

Security ..... WPA, WPA2, WPA2-Enterprise

USB Ports

USB host port ..... USB 2.0 Hi-Speed

USB device port ..... USB 2.0 Hi-Speed

Analog Input

Aggregate sample rate ..... 500 kS/s

Resolution ..... 12 bits

Overvoltage protection ..... ±16 V

MXP connectors

- Configuration ..... Four single-ended channels per connector
- Input impedance ..... >500 kΩ acquiring at 500 kS/s
1 MΩ powered on and idle
4.7 kΩ powered off
- Recommended source impedance ..... 3 kΩ or less
- Nominal range ..... 0 V to +5 V
- Absolute accuracy ..... ±50 mV
- Bandwidth ..... >300 kHz

MSP connector

- Configuration ..... Two differential channels
- Input impedance ..... Up to 100 nA leakage powered on;
4.7 kΩ powered off
- Nominal range ..... ±10 V
- Working voltage
(signal + common mode) ..... ±10 V of AGND
- Absolute accuracy ..... ±200 mV
- Bandwidth ..... 20 kHz minimum, >50 kHz typical

Audio input

- Configuration ..... One stereo input consisting of two AC-coupled, single-ended channels
- Input impedance ..... 10 kΩ at DC
- Nominal range ..... ±2.5 V
- Bandwidth ..... 2 Hz to >20 kHz

Analog Output

Aggregate maximum update rates

- All AO channels on MXP connectors ..... 345 kS/s
- All AO channels on MSP connector and audio output channels ..... 345 kS/s

Resolution ..... 12 bits

Overload protection ..... ±16 V

Startup voltage ..... 0 V after FPGA initialization

MXP connectors

- Configuration ..... Two single-ended channels per connector
- Range ..... 0 V to +5 V
- Absolute accuracy ..... 50 mV
- Current drive ..... 3 mA
- Slew rate ..... 0.3 V/µs

MSP connector

- Configuration ..... Two single-ended channels
- Range ..... ±10 V
- Absolute accuracy ..... ±200 mV
- Current drive ..... 2 mA
- Slew rate ..... 2 V/µs

Audio output

- Configuration ..... One stereo output consisting of two AC-coupled, single-ended channels
- Output impedance ..... 100 Ω in series with 22 µF
- Bandwidth ..... 70 Hz to >50 kHz into 32 Ω load; 2 Hz to >50 kHz into high-impedance load

Digital I/O

Number of lines

- MXP connectors ..... 2 ports of 16 DIO lines (one port per connector); one UART.RX and one UART.TX line per connector
- MSP connector ..... 1 port of 8 DIO lines

Direction control ..... Each DIO line individually programmable as input or output

Logic level ..... 5 V compatible LVTTL input; 3.3 V LVTTL output

Input logic levels

- Input low voltage, V_{IL} ..... 0 V min; 0.8 V max
- Input high voltage, V_{IH} ..... 2.0 V min; 5.25 V max

Output logic levels

- Output high voltage, V_{OH} sourcing 4 mA ..... 2.4 V min; 3.465 V max
- Output low voltage, V_{OL} sinking 4 mA ..... 0 V min; 0.4 V max

Minimum pulse width..... 20 ns

Maximum frequencies for secondary digital functions

- SPI ..... 4 MHz
- PWM..... 100 kHz
- Quadrature encoder input ..... 100 kHz
- I^2C..... 400 kHz

UART lines

- Maximum baud rate..... 230,400 bps
- Data bits..... 5, 6, 7, 8
- Stop bits 1, 2
- Parity..... Odd, Even, Mark, Space
- Flow control..... XON/XOFF

Accelerometer

Number of axes..... 3

Range ..... ±8 g

Resolution..... 12 bits

Sample rate ..... 800 S/s

Noise..... 3.9 mg_{rms} typical at 25 °C

Power Output

+5 V power output

- Output voltage ..... 4.75 V to 5.25 V
- Maximum current on each connector ..... 100 mA

+3.3 V power output

- Output voltage ..... 3.0 V to 3.6 V
- Maximum current on each connector ..... 150 mA

+15 power output

Output voltage.....+15 V to +16 V

Maximum current .....32 mA (16 mA during startup)

-15 V power output

Output voltage.....-15 V to -16 V

Maximum current .....32 mA (16 mA during startup)

Maximum combined power from +15 V and -15 V power output .....500 mW

Power Requirements

NI myRIO-1900 requires a power supply connected to the power connector.

Power supply voltage range.....6 to 16 VDC

Maximum power consumption .....14 W

Typical idle power consumption.....2.6 W

Environmental

To meet these specifications, you must operate the NI myRIO-1900 with the window facing away from the mounting surface and ensure that there is at least 1 in. of clearance in front of the window during use.

Ambient temperature near device (IEC 60068-2-1, IEC 600682-2).....0 to 40 °C

Storage temperature (IEC 60068-2-1, IEC 600682-2).....-20 to 70 °C

Operating humidity (IEC 60068-2-56) .....10 to 90% RH, noncondensing

Storage humidity (IEC 60068-2-56) .....10 to 90% RH, noncondensing

Maximum altitude.....2,000 m

Pollution Degree (IEC 60664) 2

Indoor use only.

Physical Characteristics

Weight.....193 g (6.8 oz)

Safety

Safety Standards

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.

Caution Using the NI myRIO-1900 in a manner not described in this document may impair the protection the NI myRIO-1900 provides.

Hazardous Locations

The NI myRIO-1900 is not certified for use in hazardous locations.

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 55022 (CISPR 22): Group 1, Class A emissions
- EN 55011 (CISPR 11): Group 1, Class A emissions
- AS/NZS CISPR 11: Group 1, Class A emissions
- AS/NZS CISPR 22: Group 1, Class A emissions
- FCC 47 CFR Part 15B: Class A emissions
- ICES-001: Class A emissions

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

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)
- 1999/5/EC; Radio and Telecommunications Terminal Equipment Directive (R&TTE)

Online Product Certification

To obtain product certifications and the Declaration of Conformity (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 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`.

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`.)

Regulatory Information

United States

FCC Radio Exposure

The radiated output power of this device is below the FCC radio frequency exposure limits. Nevertheless, this device should be used in such a manner that the potential for human contact during normal operation is minimized. This device has been evaluated for and shown compliant with the FCC RF Exposure limits under mobile exposure conditions (antennas are greater than 20 cm from a person's body). This device cannot be co-located with any other transmitter unless approved by FCC.

This product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate the warranty and all applicable regulatory certifications and approvals.

FCC Interference Statement

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This wireless adapter generates, uses, and can radiate radio frequency energy. If the wireless adapter is not installed and used in accordance with the instructions, the wireless adapter may

cause harmful interference to radio communications. There is no guarantee, however, that such interference will not occur in a particular installation. If this wireless adapter does cause harmful interference to radio or television reception (which can be determined by turning the equipment off and on), the user is encouraged to try to correct the interference by taking one or more of the following measures:

- Reorient or relocate the receiving antenna of the equipment experiencing the interference.
- Increase the distance between the wireless adapter and the equipment experiencing the interference.
- Connect the equipment to an outlet on a circuit different from which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada

Industry Canada (IC) Notices

This product complies with Industry Canada RSS-210.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, the radio transmitter(s) in this device may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Avis d'Industry Canada (IC)

Cet appareil est conforme aux norme RSS210 d'Industrie Canada.

Cet appareil est conforme aux normes d'exemption de licence RSS d'Industry Canada. Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Conformément aux réglementations d'Industry Canada, les émetteurs radio de cet appareil ne peuvent fonctionner qu'à l'aide d'une antenne dont le type et le gain maximal (ou minimal) pour ces émetteurs – transmetteurs sont approuvés par Industry Canada. Pour réduire le risque d'interférence éventuelle pour les autres utilisateurs, le type et le gain de l'antenne doivent être choisis de manière à ce que la puissance isotrope rayonnée équivalente (p.i.r.e.) minimale nécessaire à une bonne communication soit fournie.

EU Regulatory Statements

cs Česky [Czech]	*National Instruments* tímto prohlašuje, že tento NI myRIO-1900 je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede *National Instruments* erklærer herved, at følgende udstyr NI cDAQ-1900 overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt *National Instruments*, dass sich das Gerät NI myRIO-1900 in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab*National Instruments* seadme NI myRIO-1900 vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, *National Instruments*, declares that this NI myRIO-1900 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente *National Instruments* declara que el NI myRIO-1900 cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *National Instruments* ΔΗΛΩΝΕΙ ΟΤΙ NI myRIO-1900 ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr Français [French]	Par la présente *National Instruments* déclare que l'appareil NI myRIO-1900 est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
it Italiano [Italian]	Con la presente *National Instruments* dichiara che questo NI myRIO-1900 è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
lv Latviski [Latvian]	Ar šo *National Instruments* deklarē, ka NI myRIO-1900 atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
lt Lietuvių [Lithuanian]	Šiuo *National Instruments* deklaruoja, kad šis NI myRIO-1900 atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl Nederlands [Dutch]	Hierbij verklaart *National Instruments* dat het toestel NI myRIO-1900 in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt Malti [Maltese]	Hawnhekk, *National Instruments*, jiddikjara li dan NI myRIO-1900 jikkonforma mal-htigijiet essenzjali u ma provvedimenti ohrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, *National Instruments* nyilatkozom, hogy a NI myRIO-1900 megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.

pl Polski [Polish]	Niniejszym *National Instruments*. oświadcza, że NI myRIO-1900 jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	*National Instruments* declara que este NI myRIO-1900 está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko [Slovenian]	*National Instruments* izjavlja, da je ta NI myRIO-1900 v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
sk Slovensky [Slovak]	*National Instruments* týmto vyhlasuje, že NI myRIO-1900 spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
fi Suomi [Finnish]	*National Instruments* vakuuttaa täten että NI myRIO-1900 tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
sv Svenska [Swedish]	Härmed intygar *National Instruments* att denna NI myRIO-1900 står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.
Íslenska [Icelandic]	Hér með lýsir *National Instruments* yfir því að NI myRIO-1900 er í samræmi við grunnkröfur og aðrar kröfur, sem gerðar eru í tilskipun 1999/5/EC.
no Norsk [Norwegian]	*National Instruments* erklærer herved at utstyret NI myRIO-1900 er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

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.

Singapore

Complies with IDA Standards DA105692

Taiwan R.O.C.

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第十二條經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。
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Mexico

La operación de este equipo está sujeta a las siguientes dos condiciones:
1) es posible que este equipo o dispositivo no cause interferencia perjudicial y
2) este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su propia operación no deseada.

Brazil



Brasil-Aviso da Anatel

Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.

Warranty

For customers other than private individual users in the EU: The NI myRIO-1900 is warranted against defects in materials and workmanship for a period of one year from the date of shipment, as evidenced by receipts or other documentation. National Instruments will, at its option, repair or replace equipment that proves to be defective during the warranty period. This warranty includes parts and labor.

For private individual users in the EU: Based on your statutory rights, National Instruments will—through its distributor—cure defects in materials and workmanship within two years from delivery.

Worldwide Support and Services

The NI website is your complete resource for technical support. At ni.com/support you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.

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Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.

A Declaration of Conformity (DoC) is our claim of compliance with the Council of the European Communities using the manufacturer's declaration of conformity. This system affords the user protection for electromagnetic compatibility (EMC) and product safety. You can obtain the DoC for your product by visiting ni.com/certification. If your product supports calibration, you can obtain the calibration certificate for your product at ni.com/calibration.

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