

## DEVICE SPECIFICATIONS

# NI 5741

## 16-Channel Signal Generator

This document lists specifications for the NI 5741 adapter module. Pair these specifications with the specifications listed in your NI FlexRIO FPGA specifications document.



**Caution** To avoid permanent damage to the NI 5741, disconnect all signals connected to the NI 5741 before powering down the module, and only connect signals after the module has been powered on by the FlexRIO FPGA module.



**Caution** The protection provided by the NI 5741 can be impaired if it is used in a manner not described in this document.



**Note** All numeric specifications are typical unless otherwise noted.

Specifications are subject to change without notice. For the most recent device specifications, visit [ni.com/manuals](http://ni.com/manuals).

## Contents

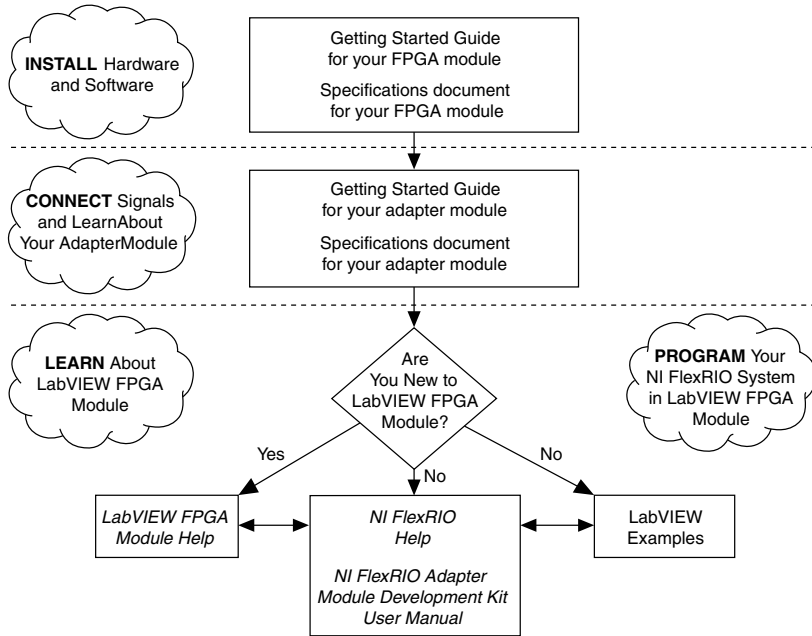
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# How to Use Your NI FlexRIO Documentation

Refer to the following flowchart for information about how to use NI FlexRIO documentation.

**Figure 1.** How to Use Your NI FlexRIO Documentation



## FlexRIO Documentation Locations

**Table 1.** FlexRIO Documentation Locations and Descriptions

Document	Location	Description
Getting started guide for your FPGA module	Available from the Start menu and at <a href="http://ni.com/manuals">ni.com/manuals</a> .	Contains installation instructions for your FlexRIO system.
Specifications document for your FPGA module	Available from the Start menu and at <a href="http://ni.com/manuals">ni.com/manuals</a> .	Contains specifications for your FPGA module.
Getting started guide for your adapter module	Available from the Start menu and at <a href="http://ni.com/manuals">ni.com/manuals</a> .	Contains signal information, examples, and CLIP details for your adapter module.

**Table 1.** FlexRIO Documentation Locations and Descriptions (Continued)

<b>Document</b>	<b>Location</b>	<b>Description</b>
Specifications document for your adapter module	Available from the Start menu and at <a href="http://ni.com/manuals">ni.com/manuals</a> .	Contains specifications for your adapter module.
<i>LabVIEW FPGA Module Help</i>	Embedded in <i>LabVIEW Help</i> and at <a href="http://ni.com/manuals">ni.com/manuals</a> .	Contains information about the basic functionality of the LabVIEW FPGA Module.
<i>NI FlexRIO Help</i>	Available from the Start menu and at <a href="http://ni.com/manuals">ni.com/manuals</a> .	Contains information about the FPGA module, adapter module, and CLIP configuration information.
<i>NI FlexRIO Adapter Module Development Kit User Manual</i>	Available from the Start menu at <b>Start»All Programs»National Instruments»NI FlexRIO»NI FlexRIO Adapter Module Development Kit»Documentation.</b>	Contains information about how to create custom adapter modules for use with FlexRIO FPGA modules.
LabVIEW Examples	Available in NI Example Finder. In LabVIEW, click <b>Help»Find Examples»Hardware Input and Output»FlexRIO.</b>	Contains examples of how to run FPGA VIs and Host VIs on your device.
IPNet	Located at <a href="http://ni.com/ipnet">ni.com/ipnet</a> .	Contains LabVIEW FPGA functions and intellectual property to share.
NI FlexRIO product page	Located at <a href="http://ni.com/flexrio">ni.com/flexrio</a> .	Contains product information and data sheets for FlexRIO devices.

## Analog Output

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### General Characteristics

Number of channels.....16

Connector type.....VHDCI

Output type.....	Single-ended, DC-coupled
Digital data resolution.....	16-bit, unsigned, binary data <sup>1</sup>
Data update rate.....	Up to 1 MS/s <sup>2</sup>
Sample Clock sources.....	Internal FPGA-based data clock
DAC part number.....	AD5541A

## Related Information

*For more information about the DAC, refer to the Analog Devices website.*

## Typical Specifications

Output impedance.....	0.8 $\Omega$ , typical
Output current drive.....	$\pm 2$ mA
Overdrive protection.....	$\pm 20$ V

### Glitch

Mid-scale glitch.....	$\pm 10$ mV at 3 $\mu$ s
Turn-on glitch.....	$\pm 1$ V for 2 ms

### Noise

Average noise density.....	28 nV/ $\sqrt{\text{Hz}}$
RMS noise to 1 MHz (single pole roll-off equivalent).....	35 $\mu$ V <sub>rms</sub>

### Gain and offset

Full-scale range.....	4.996 V $\pm$ 2.3 mV
Offset error.....	$\pm 5.7$ mV
Gain error.....	$\pm 0.1\%$

### Integral non-linearity (INL)

Typical.....	$\pm 0.5$ least significant bits (LSB)
Maximum.....	$\pm 2$ LSB

### Differential non-linearity (DNL)

Typical.....	$\pm 0.5$ LSB
Maximum.....	$\pm 1$ LSB

<sup>1</sup> Data is written using a U16 data type.

<sup>2</sup> Each channel can be individually updated.

Settling time	
8 LSB.....	3.0 $\mu$ s
4 LSB.....	3.8 $\mu$ s
2 LSB.....	5.1 $\mu$ s
Slew rate.....	10 V/ $\mu$ s

## Programmable Function Interface (PFI 0, Front Panel Connector)

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Connector.....	SMA
Direction.....	Bidirectional

## AUX I/O (Port 0 DIO <0..3>, Port 1 DIO <0..3>, and PFI <0..3>)

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Number of channels.....	12 bidirectional (8 DIO and 4 PFI)
Connector type.....	HDMI
Interface standard.....	3.3 V LVCMOS
Interface logic	
Maximum $V_{IL}$ .....	0.8 V
Minimum $V_{IH}$ .....	2.0 V
Maximum $V_{OL}$ .....	0.4 V
Minimum $V_{OH}$ .....	2.7 V
Maximum $V_{OH}$ .....	3.6 V
$Z_{out}$ .....	50 $\Omega$ $\pm$ 20%
$I_{out}$ (DC).....	$\pm$ 2 mA
Pull-down resistor.....	150 k $\Omega$
Recommended operating voltage.....	-0.3 V to 3.6 V
Overvoltage protection.....	$\pm$ 10 V
Maximum toggle frequency.....	100 MHz
+5 V maximum power.....	10 mA
+5 V voltage tolerance.....	4.2 V to 5 V

# Environment

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Maximum altitude.....2,000 m (800 mbar) (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. Meets MIL-PRF-28800F Class 3 low temperature limit and MIL-PRF-28800F Class 2 high temperature limit.)

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

## Storage Environment

Ambient temperature range.....-40 °C to 71 °C (Tested in accordance with IEC 60068-2-1 and IEC 60068-2-2. Meets MIL-PRF-28800F Class 3 limits.)

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

## Shock and Vibration

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Operating shock.....30 g peak, half-sine, 11 ms pulse (Tested in accordance with IEC 60068-2-27. Meets MIL-PRF-28800F Class 2 limits.)

### Random vibration

Operating.....5 Hz to 500 Hz, 0.3 g<sub>rms</sub>

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

# Compliance and Certifications

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## 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, certifications, and additional information, refer to the [Online Product Certification](#) section.

## CE Compliance

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)

## 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](http://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](http://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](http://ni.com/environment/weee).

## 电子信息产品污染控制管理办法（中国 RoHS）



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