PXIe-7911/7912/7915 Getting Started

Contents

Getting Started Guide

> **Note** Before you begin, install and configure your chassis and controller.

This document explains how to install, configure, test, and use the PXIe-7911/7912/7915. You can program the PXIe-7911/7912/7915 with the following software options.

- FlexRIO Support driver software
- NI LabVIEW Instrument Design Libraries for FlexRIO (instrument design libraries)

Safety Guidelines

> ⚠ **Caution** You can impair the protection provided by the PXIe-7911/7912/7915 if you use it in a manner not described in this document.

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 industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. 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 changes or modifications to the product not expressly approved by NI could void your authority to operate it under your local regulatory rules.

FlexRIO Documentation and Resources

Document/Resource	Location	Description
PXIe-7911/7912/7915 Getting Started Guide (this document)	Available at ni.com/ manuals.	Contains installation instructions and basic programming instructions for your PXIe-7911/7912/7915.
PXI-7911 Specifications, PXI-7912 Specifications, PXI-7915 Specifications	Available at ni.com/ manuals.	Contains specifications for your PXIe-7911/7912/7915.
PXIe-7911/7912/7915 Safety, Environmental, and Regulatory Information	Available at ni.com/ manuals.	Contains important safety, environmental, and regulatory information for your PXIe-7911/7912/7915.
LabVIEW FPGA Module Help	Embedded in **LabVIEW Help** and at ni.com/ manuals.	Contains information about the basic functionality of the LabVIEW FPGA Module.
FlexRIO Help	Available at ni.com/ manuals.	Contains information about the FPGA module front panel connectors and I/O, programming instructions, and I/O component-level IP (CLIP).
LabVIEW Examples	Available in NI Example Finder. In LabVIEW, click Help » Find Examples » Hardware Input and Output » FlexRIO.	Contains examples of how to run FPGA VIs and Host VIs on your FlexRIO devices.
FlexRIO product page	Located at ni.com/ flexrio.	Contains product information and data sheets for FlexRIO hardware.

Table 1. FlexRIO Documentation and Resources

Verifying the System Requirements

To use the PXIe-7911/7912/7915, your system must meet certain requirements. For more information about minimum system requirements, recommended system,

and supported application development environments (ADEs), refer to the readme, which is installed or available at ni.com/manuals.

Unpacking the Kit

> **(!) Notice** To prevent electrostatic discharge (ESD) from damaging the device, ground yourself using a grounding strap or by holding a grounded object, such as your computer chassis.

1. Touch the antistatic package to a metal part of the computer chassis.
2. Remove the device from the package and inspect the device for loose components or any other sign of damage.

> **(!) Notice** Never touch the exposed pins of connectors.

> **✏ Note** Do not install a device if it appears damaged in any way.

3. Unpack any other items and documentation from the kit.

Store the device in the antistatic package when the device is not in use.

PXIe-7911/7912/7915 Kit Contents

The following items are included in the device kit:

- PXIe-7911/7912/7915
- Documentation:
    - **PXIe-7911/7912/7915 Getting Started Guide** (this document)
    - **PXIe-7911/7912/7915 Safety, Environmental, and Regulatory Information**

Preparing the Environment

Ensure the environment in which you are using the PXIe-7911/7912/7915 meets the following specifications.

Operating environment	
Ambient temperature range	0 °C to 45 °C (Tested in accordance with IEC-60068-2-1 and IEC-60068-2-2. Meets MIL-PRF-28800FClass 3 low temperature limit and MIL-PRF-28800FClass 4 high temperature limit.)
Relative humidity range	10% to 90%, noncondensing
Maximum altitude	2,000 m (800 mbar) (at 25 °C ambient temperature)
Pollution Degree	2

Indoor use only.

> **Note** For complete specifications, refer to the specifications document for your device at ni.com/manuals.

Installing the Application Software and Driver

Before installing your hardware, you must install the application software and instrument driver. Visit NI FlexRIO Driver Supported Versions for FlexRIO Adapters and Modules to determine which minimum software versions you need for your device. Install the software in the following order:

1. Install LabVIEW.
   Refer to the **LabVIEW Installation Guide** for installation instructions for LabVIEW and system requirements for the LabVIEW software. Refer to the **LabVIEW Upgrade Notes** for additional information about upgrading to the most recent version of LabVIEW for Windows. Documentation for LabVIEW is available at ni.com/manuals and by selecting Start » All Programs » National Instruments » LabVIEW » LabVIEW Manuals.

2. Install the LabVIEW FPGA Module.

Refer to the **LabVIEW FPGA Module Release and Upgrade Notes** for installation instructions and information about getting started with the LabVIEW FPGA Module. Documentation for the LabVIEW FPGA Module is available at ni.com/manuals and by selecting Start » All Programs » National Instruments » LabVIEW » LabVIEW Manuals.

3. Install FlexRIO Support.
   Refer to the **FlexRIO Readme** on the FlexRIO installation media for system requirements and installation instructions for FlexRIO Support. Documentation for FlexRIO Support is available at ni.com/manuals and by selecting Start » All Programs » National Instruments » NI FlexRIO.

Installing the PXIe-7911/7912/7915

> (!) **Notice** To prevent damage to the PXIe-7911/7912/7915 caused by ESD or contamination, handle the module using the edges or the metal bracket.

1. Ensure the AC power source is connected to the chassis before installing the module.
   The AC power cord grounds the chassis and protects it from electrical damage while you install the module.

2. Power off the chassis.

3. Inspect the slot pins on the chassis backplane for any bends or damage prior to installation. Do not install a module if the backplane is damaged.

4. Remove the black plastic covers from all the captive screws on the module front panel.

5. Identify a supported slot in the chassis. The following figure shows the symbols that indicate the slot types.

Figure 1. Chassis Compatibility Symbols
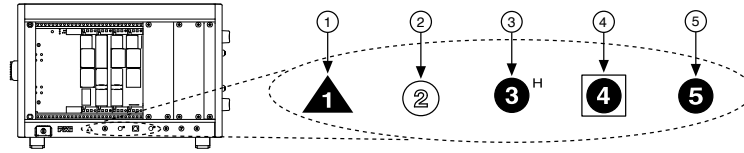
1. PXI Express System Controller Slot
2. PXI Peripheral Slot
3. PXI Express Hybrid Peripheral Slot
4. PXI Express System Timing Slot
5. PXI Express Peripheral Slot

6. Touch any metal part of the chassis to discharge static electricity.

7. Ensure that the ejector handle is in the downward (unlatched) position.

8. Place the module edges into the module guides at the top and bottom of the chassis. Slide the module into the slot until it is fully inserted.

9. Latch the module in place by pulling up on the ejector handle.

10. Secure the module front panel to the chassis using the front-panel mounting screws.

> **Note** Tightening the top and bottom mounting screws increases mechanical stability and also electrically connects the front panel to the chassis, which can improve the signal quality and electromagnetic performance.

11. Cover all empty slots using either filler panels (standard or EMC) or slot blockers with filler panels, depending on your application.

> **Note** For more information about installing slot blockers and filler panels, go to ni.com/r/pxiblocker.

12. Power on the chassis.

PXIe-7911/7912/7915 Front Panels

The following figures show the PXIe-7911/7912/7915 front panels.
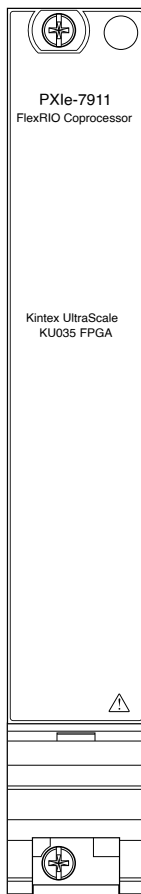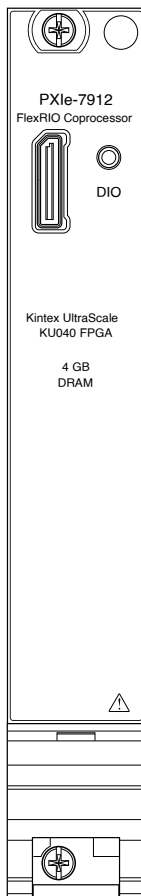
Figure 2. PXIe-7911 Front Panel

Figure 3. PXIe-7912 Front Panel

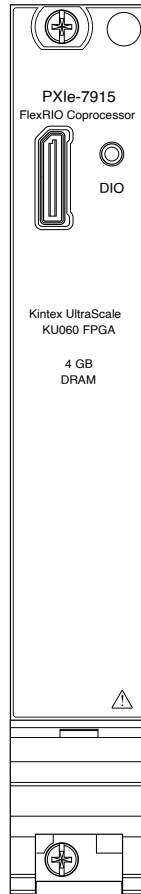The following table describes the signal connections for the PXIe-7912.

Connector	Description	Function
DIO	Molex™ Nano-Pitch DIO connector	Multi-signal DIO connector that provides access to FPGA multi-gigabit transceivers (MGTs) and general-purpose LVCMOS signals.

The following table lists the available pins on the DIO connector.

Signal	Type	Description
MGT Tx± <3..0>	Xilinx UltraScale GTH	Output
MGT Rx± <3..0>	Xilinx UltraScale GTH	Input
DIO <7..0>	Single-ended	Bidirectional
5.0 V	DC	Output

Signal	Type	Description
GND	Ground	—

Figure 4. PXIe-7915 Front Panel

The following table describes the signal connections for the PXIe-7915.

Connector	Description	Function
DIO	Molex™ Nano-Pitch DIO connector	Multi-signal DIO connector that provides access to FPGA multi-gigabit transceivers (MGTs) and general-purpose LVCMOS signals.

The following table lists the available pins on the DIO connector.

Signal	Type	Description
MGT Tx± <3..0>	Xilinx UltraScale GTH	Output
MGT Rx± <3..0>	Xilinx UltraScale GTH	Input

Signal	Type	Description
DIO <7..0>	Single-ended	Bidirectional
5.0 V	DC	Output
GND	Ground	—

Configuring the PXIe-7911/7912/7915 in MAX

Use Measurement & Automation Explorer (MAX) to configure your NI hardware. MAX informs other programs about which NI hardware products are in the system and how they are configured. MAX is automatically installed with FlexRIO Support.

1. Launch MAX.

2. In the configuration tree, expand Devices and Interfaces to see the list of installed NI hardware.
   Installed modules appear under the name of their associated chassis.

3. Expand your Chassis tree item.
   MAX lists all modules installed in the chassis. Your default names may vary.

   > **Note** If you do not see your module listed, press <F5> to refresh the list of installed modules. If the module is still not listed, power off the system, ensure the module is correctly installed, and restart.

4. Record the identifier MAX assigns to the hardware. Use this identifier when programming the PXIe-7911/7912/7915.

5. Self-test the hardware by selecting the item in the configuration tree and clicking Self-Test in the MAX toolbar.
   The MAX self-test performs a basic verification of hardware resources.

FlexRIO Examples

FlexRIO includes several example applications for LabVIEW. These examples serve as interactive tools, programming models, and as building blocks in your own applications.

Accessing FlexRIO Examples

FlexRIO examples are available in LabVIEW's NI Example Finder. Complete the following steps to access the examples by task.

1. In LabVIEW, click Help » Find Examples.

2. In the NI Example Finder window that appears, click Hardware Input and Output » FlexRIO.
   Click on an example and refer to the Information window for a description of the example. Refer the Requirements window for a list of hardware that can run the example.
   You can also click the Search tab to search all installed examples by keyword. For example, search for FlexRIO to locate all FlexRIO examples.

Online examples are also available to demonstrate FlexRIO basics, such as using DRAM, acquiring data from adapter modules, and performing high throughput streaming. To access these examples, search FlexRIO examples in the Search the community field at ni.com/examples.
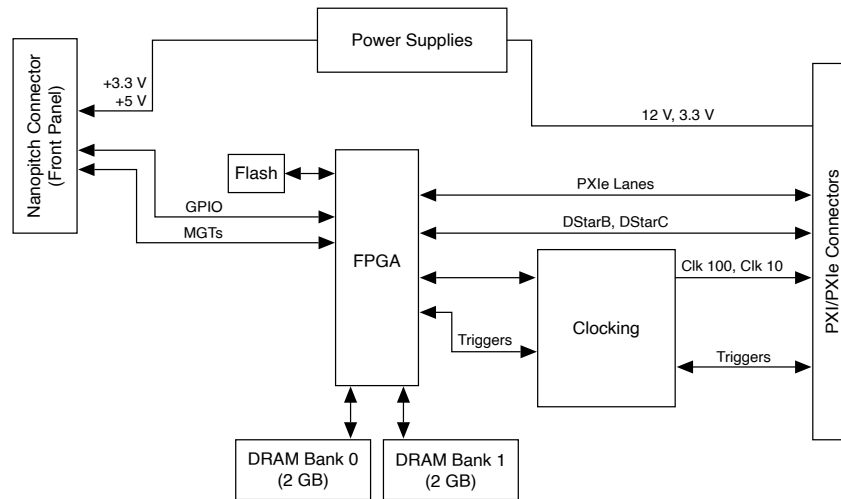
Block Diagram

The following figure shows the PXIe-7911 block diagram and signal flow.

Figure 5. PXIe-7911 Block Diagram
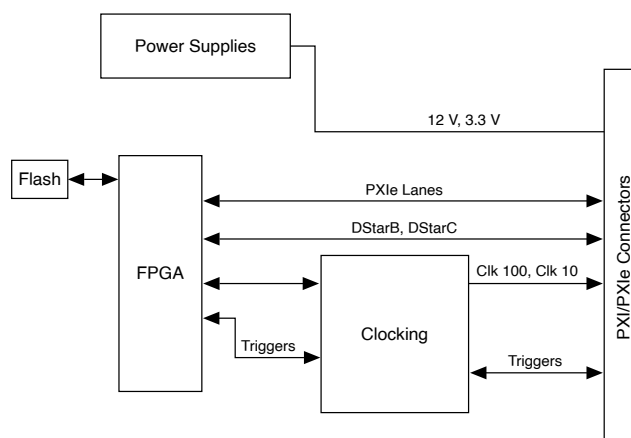
The following figure shows the block diagram and signal flow for both the PXIe-7912 and PXIe-7915.

Figure 6. PXIe-7912 and PXIe-7915 Block Diagram

Making a Measurement with LabVIEW

1. Launch LabVIEW.
2. Select Help » Find Example.
3. Open the example VI that you want to use by selecting Hardware Input and Output » FlexRIO.
4. Follow any setup, configuration, and execution instructions in the VI.

Troubleshooting

If an issue persists after you complete a troubleshooting procedure, search our KnowledgeBase for additional information our technical support engineers create as they answer common user questions and resolve unexpected issues.

What Should I Do if the PXIe-7911/7912/7915 Does Not Appear in MAX?

1. In the MAX configuration tree, expand Devices and Interfaces.
2. Expand the Chassis tree to see the list of installed hardware, and press <F5> to refresh the list.

3. If the module is still not listed, power off the system, ensure that all hardware is correctly installed, and restart the system.

4. Navigate to the Device Manager by right-clicking the Start button, and selecting Device Manager.

5. Verify the PXIe-7911/7912/7915 appears in the Device Manager.

    1. Under an NI entry, confirm that a PXIe-7911/7912/7915 entry appears.

    > **Note** If you are using a PC with a device for PXI remote control system, under System Devices, also confirm that no error conditions appear for the PCI–to–PCI Bridge.

    2. If error conditions appear, reinstall the FlexRIO Support driver.

What Should I Do if the PXIe-7911/7912/7915 Fails the Self-Test?

1. Restart the system.
2. Launch MAX, and perform the self-test again.
3. Power off the chassis.
4. Reinstall the failed module in a different slot.
5. Power on the chassis.
6. Perform the self-test again.

NI Services

Visit ni.com/support to find support resources including documentation, downloads, and troubleshooting and application development self-help such as tutorials and examples.

Visit ni.com/services to learn about NI service offerings such as calibration options, repair, and replacement.

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

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