APEX WAVES PXIe-5842 Third Generation PXI Vector Signal Transceiver Instructions

Contents

PXIe-5842 Third Generation PXI Vector Signal Transceiver

PXIe-5842 – Product Information

The PXIe-5842 is a 23 GHz, 2 GHz Bandwidth, RF PXI Vector Signal
Transceiver. It is a module that requires installation, configuration, operation, and maintenance by following the instructions given in the user manual.

It is important to familiarize yourself with the installation and wiring instructions and comply with all applicable codes, laws, and standards. Safety, Environmental, and Regulatory Information for the instrument can be found in the documentation for each module in your PXIe-5842.

Icons
The following icons may be marked on your product or used in the guide:

Notice: Take precautions to avoid data loss, loss of signal integrity, degradation of performance, or damage to the product.

Caution: Take precautions to avoid injury. Consult the product documentation for cautionary statements when you see this icon printed on the product. Cautionary statements are localized into French for compliance with Canadian requirements.

ESD Sensitive: Take precautions to avoid damaging the product with electrostatic discharge.

Safety Guidelines
Connect only voltages that are below the limits mentioned below:

- +27 dBm with RF IN absolute maximum input power reference level >20 dBm
- **RF OUT** absolute maximum reverse power
- **RF OUT:** LO IN absolute maximum input power
- **RF OUT:** LO OUT absolute maximum reverse power
- **RF IN:** LO IN absolute maximum input power
- **RF IN:** LO OUT absolute maximum reverse power
- **REF:** IN maximum input voltage Frequency 10 MHz
- Frequency 6.6 Gbps CTRL absolute maximum input 150 mV pk-pk to 1.25 V pk-pk 1.8 V

NOTE: The CTRL port is not an HDMI interface. Do not connect the CTRL port on the PXIe-5842 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

- **PULSE:** IN, PULSE: OUT absolute maximum input 5 V

NOTE: Use of the PULSE: IN and PULSE: OUT connectors is reserved.

Measurement Category
CAT I/O

Connector Nomenclature
Individual connectors not within a larger grouping of connectors are named according to their label on the front panel; individual connectors within a grouping of connectors are named according to the convention Grouping Label: Connector Label. For example:

- **RF IN –**-The individual connector on the PXIe-5842 front panel labeled RF IN
- **RF IN:** LO OUT –The individual connector on the PXIe-5842 front panel labeled LO OUT within the group of connectors on the PXIe-5842 labeled RF IN

PXIe-5842 – Product Usage Instructions

Follow the instructions below for using the PXIe-5842:

1. Familiarize yourself with the installation and wiring instructions in the user manual.
2. Connect only voltages that are below the limits mentioned in the Safety Guidelines section.
3. Do not connect the CTRL port on the PXIe-5842 to the HDMI interface of another device.
4. Use of the PULSE: IN and PULSE: OUT connectors is reserved.
5. Follow the Connector Nomenclature convention for identifying individual connectors.

Safety, Environmental, and Regulatory Information

Read this document before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards. Visit **ni.com/manuals** for more information about your product, including specifications, pinouts, and instructions for connecting, installing, and configuring your system.

NOTE
This document applies to the individual PXIe-5842 module. Refer to the documentation for each module in your PXIe-5842 instrument to understand the complete safety, environmental, and regulatory information for the instrument.

Icons
Refer to the following descriptions if one of these icons is marked on your product or used in this guide.

Notice —Take precautions to avoid data loss, loss of signal integrity, degradation of performance, or damage to the product.

Caution — Take precautions to avoid injury. Consult the product documentation for cautionary statements when you see this icon printed on the product. Cautionary statements are localized into French for compliance with Canadian requirements.

ESD Sensitive —Take precautions to avoid damaging the product with electrostatic discharge.

Safety Guidelines

CAUTION
Observe all instructions and cautions in the user documentation. Using the product in a manner not specified can damage the product and compromise the built-in safety protection.

Safety Voltages

Connect only voltages that are below these limits.

- RF IN absolute maximum input power: +27 dBm with reference level 20 dBm
- RF OUT absolute maximum reverse power

  +20 dBm with output power setting set to maximum
- RF OUT: LO IN absolute maximum input power +15 dBm
- RF OUT: LO OUT absolute maximum reverse power +10 dBm
- RF IN: LO IN absolute maximum input power +15 dBm
- RF IN: LO OUT absolute maximum reverse power +10 dBm
- REF: IN maximum input voltage
  - Frequency ≥10 MHz 5 V pk-pk
  - Frequency <10 MHz 2 V pk-pk
- REF: OUT absolute maximum reverse voltage 2 V pk-pk
- PFI 0 absolute maximum input range -0.5 V to 5 V
- DIO absolute maximum input range -0.5 V to 5 V

NOTICE
The DIO port is not an HDMI interface. Do not connect the DIO port on the PXIe-5842 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

MGT absolute maximum input range

- ≤6.6 Gbps: 150 mV pk-pk to 2 V pk-pk
- 6.6 Gbps: 150 mV pk-pk to 1.25 V pk-pk
- CTRL absolute maximum input 1.8 V

NOTICE

The CTRL port is not an HDMI interface. Do not connect the CTRL port on the PXIe-5842 to the HDMI interface of another device. NI is not liable for any damage resulting from such signal connections.

- PULSE: IN, PULSE: OUT absolute maximum input: 5 V

NOTE
Use of the PULSE: IN and PULSE: OUT connectors is reserved.

- Measurement Category: CAT I/O

Understanding Connector Nomenclature
Individual connectors not within a larger grouping of connectors are named according to their label on the front panel; individual connectors within a grouping of connectors are named according to the convention **Grouping Label:** Connector Label. For example:

RF IN —The individual connector on the PXIe-5842 front panel labeled RF IN
RF IN: LO OUT —The individual connector on the PXIe-5842 front panel labeled LO OUT within the group of connectors on the PXIe-5842 labeled RF IN

Measurement Category

CAUTION
Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV.

- **WARNING**
  Do not connect the product to signals or use for measurements within Measurement Categories II, III, or IV, or for measurements on MAINs circuits or on circuits derived from Overvoltage Category II, III, or IV which may have transient over voltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary over voltages, and transient over voltages in the system must be conducted prior to making measurements.

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.

NOTE
Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are for other circuits not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Safety Compliance Standards

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 C22.2 No. 61010-1

NOTE
For safety certifications, refer to the product label or the Product Certifications and Declarations section.

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

This product is intended for use in commercial and light-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 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.

EMC Notices
Refer to the following notices for cables, accessories, and prevention measures necessary to ensure the specified EMC performance.

- **NOTICE**
  For EMC declarations and certifications, and additional information, refer to the Product Certifications and Declarations section.
- **NOTICE**
  Changes or modifications to the product not expressly approved by NI could void your authority to operate the product under your local regulatory rules.
- **NOTICE**
  This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.
- The performance of this product can be disrupted if subjected to Electrostatic Discharge (ESD) during operation. To prevent damage, industry-standard ESD prevention measures must be employed during installation, maintenance, and operation.
- **NOTICE**
  Operate this product only with shielded cables and accessories.

- **NOTICE**

  The length of all I/O cables must be no longer than 3 m (10 ft).

EMC Standards

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
- AS/NZS CISPR 11: Group 1, Class A emissions
- ICES-001: Class A emissions

NOTE

Group 1 equipment 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

In Europe, Australia, New Zealand, and Canada (per CISPR 11) Class A equipment is intended for use in non-residential locations.

Environmental Guidelines

- **NOTICE**

  Failure to follow the mounting instructions in the product documentation can cause temperature derating.

- **NOTICE**

  This product is intended for use in indoor applications only.

Environmental Characteristics

Temperature

- Operating 0 °C to 40 °C†
- Storage -41 °C to 71 °C

Humidity

- Operating 10% to 90%, noncondensing
- Storage 5% to 95%, noncondensing

Pollution Degree 2

- Maximum altitude 2,000 m (800 mbar) (at 25 °C ambient temperature)

Shock and Vibration

- Operating vibration 5 Hz to 500 Hz, 0.3 g RMS
- Non-operating vibration 5 Hz to 500 Hz, 2.4 g RMS
- Operating shock 30 g, half-sine, 11 ms pulse

Environmental Standards
This product meets the requirements of the following environmental standards for electrical equipment.

- IEC 60068-2-1 Cold
- IEC 60068-2-2 Dry heat
- IEC 60068-2-78 Damp heat (steady state)
- IEC 60068-2-64 Random operating vibration

† The PXIe-5842 requires a chassis with 82 W slot cooling capacity. Refer to chassis specifications to determine the ambient temperature ranges your chassis can achieve.

- IEC 60068-2-27 Operating shock

NOTE: To verify marine approval certification for a product, refer to the product label or visit ni.com/certification and search for the certificate.

Power Requirements
Power requirements, nominal

- +3.3 V DC 7.5 A (24.75 W)
- +12 V DC 14.5 A (174.0 W)
- Total power 198.75 W

Physical Characteristics

- Dimensions: 3U, 3 slots

  For more information, visit ni.com/dimensions and search by model number.
- Weight: 1,418 g (50.0 oz)

Export Compliance
This product is subject to control under the U.S. Export Administration Regulations (15 CFR Part 730 et. seq.) administered by the U.S. Department of Commerce's Bureau of Industry and Security (BIS) (www.bis.doc.gov) and other applicable U.S. export control laws and sanctions regulations. This product may also be subject to additional license requirements of other countries' regulations.
Additionally, this product may also require export licensing before being returned to NI. The issuance of a Return Material Authorization (RMA) by NI does not constitute export authorization. The user must comply with all applicable export laws prior to exporting or re-exporting this product. See ni.com/legal/export-compliance for more information and to request relevant import classification codes (e.g. HTS), export classification codes (e.g. ECCN), and other import/export data.

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 Engineering a Healthy Planet 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.

EU and UK Customers

 Waste Electrical and Electronic Equipment (WEEE) —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**.

RoHS — NI **ni.com/environment/rohs_china** (For information about China RoHS compliance, go to **ni.com/environment/rohs_china**.)

Product Certifications and Declarations

Refer to the product Declaration of Conformity (DoC) for additional regulatory compliance information. To obtain product certifications and the DoC for NI products, visit: **ni.com/product-certifications**, search by model number, and click the appropriate link.

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.
NI corporate headquarters is located at 11500 N Mopac Expwy, Austin, TX, 78759-3504, USA.

Printed in Malaysia.
327612A-01 2022-10-05

Documents / Resources

	APEX WAVES PXIe-5842 Third Generation PXI Vector Signal Transceiver [pdf] Instructions PXIe-5842, PXIe-5842 Third Generation PXI Vector Signal Transceiver, Third Generation PXI Vector Signal Transceiver, RF PXI Vector Signal Transceiver

References

- Engineer Ambitiously - NI
- Engineer Ambitiously - NI
- Product Certifications - NI
- Dimensional Drawings - NI
- Engineering a Healthy Planet - NI
- Managing Critical Substances - NI
- Product Take-Back Program and Recycling - NI
- Trade Compliance - NI
- Product Documentation - NI
- National Instruments Patents - NI
- Product Certifications - NI
- Log In - National Instruments
- NI Services - NI
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- NI Trademarks and Logo Guidelines - NI
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