PXIe-5842 Specifications

2023-03-13

Contents

Specifications Introduction

Definitions

Warranted specifications describe the performance of a model under stated operating conditions and are covered by the model warranty. Warranted specifications account for measurement uncertainties, temperature drift, and aging. Warranted specifications are ensured by design or verified during production and calibration.

Characteristics describe values that are relevant to the use of the model under stated operating conditions but are not covered by the model warranty.

- **Typical** specifications describe the performance met by a majority of models.
- **Typical-95** specifications describe the performance met by 95% (≈2σ) of models with a 95% confidence.
- **Nominal** specifications describe an attribute that is based on design, conformance testing, or supplemental testing.
- **Measured** specifications describe the measured performance of a representative model.

Specifications are **Typical** unless otherwise noted.

Conditions

All specifications are valid under the following conditions unless otherwise noted.

- 30 minutes warm-up time; warm-up time begins when the PXI Express chassis has been powered on and the operating system has completely loaded
- Self-calibration is performed after the warm-up time has completed
- Calibration cycle is maintained

- Environment temperature is within the ambient range, onboard temperature sensors within the PXIe-5842 instrument are within ±5 °C of the last self-calibration temperature, and temperature correction is enabled (default driver behavior)
- Installed in chassis with 82 W slot cooling capacity with fan mode set to Auto
- Empty chassis slots contain slot blockers and EMC filler panels to minimize temperature drift and reduce emissions
- Modules are connected with NI cables and setup instructions, as documented in **PXIe-5842 Getting Started**, are followed
- RFmx 2022 Q4 or later, NI-RFSA 2022 Q4 or later, or NI-RFSG 2022 Q4 or later instrument driver is used with driver default settings unless otherwise noted

Warranted specifications are valid under the following condition unless otherwise noted.

- Over an ambient temperature range of 0 °C to 40 °C

Typical and Typical-95 specifications are valid under the following condition unless otherwise noted.

- Over an ambient temperature range of 23 °C ±5 °C

Typical specifications do not include measurement uncertainty.

Measured specifications do not include measurement uncertainty and are measured immediately after a device self-calibration is performed.

PXIe-5842 Configurations

The PXIe-5842 name applies to various instruments, each with different specifications, that comprise different sets of individual modules. The PXIe-5842 specifications apply to different ports across modules within the PXIe-5842 instrument depending on your PXIe-5842 instrument configuration.

PXIe-5842 specifications use shorthand **Configuration** names to refer to PXIe-5842 instruments. Additionally, depending on the configuration, PXIe-5842 specifications

apply at different ports on different modules within the overall PXIe-5842 instrument.

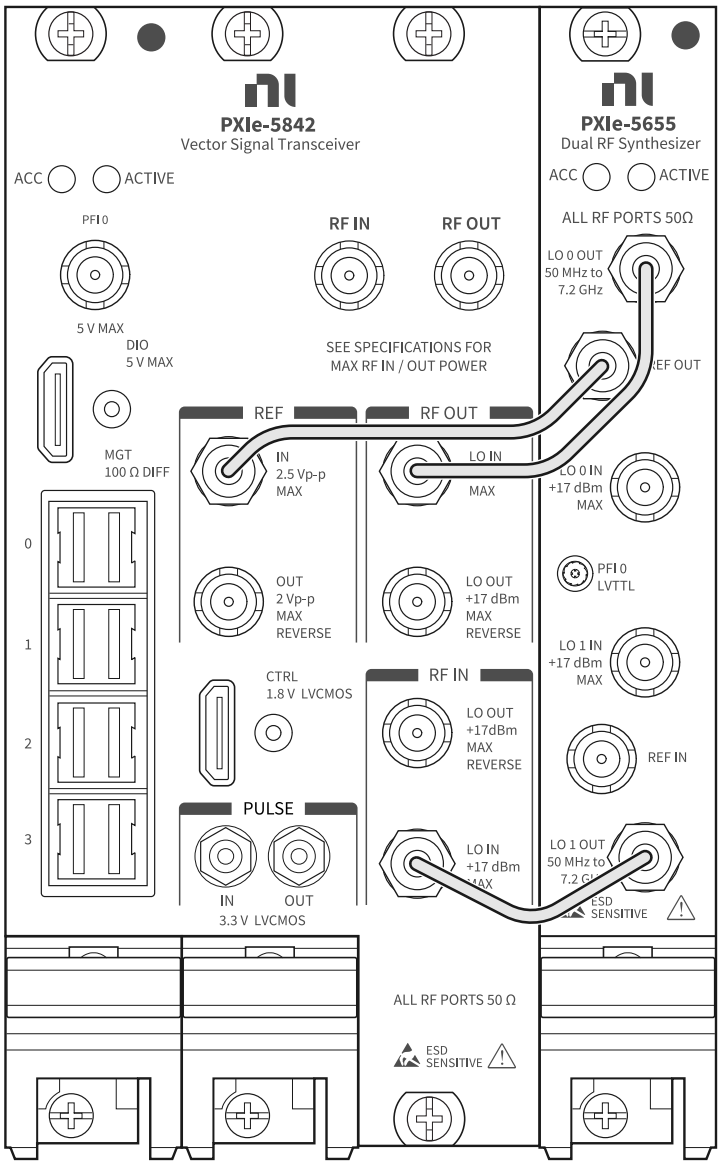
Note PXIe-5842 instruments are integrated at the time of purchase and one instrument cannot be modified into another after purchase.

The following table describes which configuration name applies to which PXIe-5842 instrument and where the RF Input and RF Output specifications apply within each PXIe-5842 instrument.

Table 1. PXIe-5842 Specifications Configurations and Applicable Ports

Instrument	Constituent Modules	Specification Configuration	Specifications Apply At		
			Module	RF Input	RF Output
PXIe-5842 VST	▪ PXIe-5842 ▪ PXIe-5655	A	PXIe-5842	RF IN	RF OUT

Figure 1. PXIe-5842 Configuration A. PXIe-5842 VST



Common NI Terminology for RF Settings

Refer to the following list for definitions of common NI terms related to software-configured settings for the PXIe-5842 and used throughout this document.

Table 3. Common Terminology Definitions

Term	Definition
Center Frequency	Refers to the IQ Carrier Frequency property in NI-RFSA, the Frequency property in NI-RFSG, and the Center Frequency property in RFmx.
Offset Mode is Automatic	Refers to the NI-RFSA Downconverter Frequency Offset Mode property or NI-RFSG Upconverter Frequency Offset Mode property set to Automatic. The PXIe-5842 uses a direct conversion architecture. Offset Mode allows the instrument to operate in low IF mode, which increases the separation between the signal of interest and the residual sideband image and residual LO leakage power. However, low IF mode limits the available instantaneous bandwidth. A setting of Automatic allows the driver to set Offset Mode to Enabled when the signal bandwidth is configured as small enough to allow it. You can read back the Offset Mode to determine if the driver selected Enabled or User-Defined. Automatic is the default value. NI recommends keeping Offset Mode set to the default value.
Offset Mode is Enabled	Refers to the NI-RFSA Downconverter Frequency Offset Mode property or NI-RFSG Upconverter Frequency Offset Mode property set to Enabled. Equivalent to **Signal Bandwidth** ≤ **Maximum Offset Bandwidth**. The PXIe-5842 uses a direct conversion architecture. Offset Mode allows the instrument to operate in low IF mode, which increases the separation between the signal of interest and

Term	Definition
	the residual sideband image and residual LO leakage power.
Offset Mode is User-Defined	Refers to the NI-RFSA Downconverter Frequency Offset Mode property or NI-RFSG Upconverter Frequency Offset Mode property set to User-Defined. Equivalent to **Signal Bandwidth** > **Maximum Offset Bandwidth**. The PXIe-5842 uses a direct conversion architecture. Offset Mode set to User-Defined allows the instrument to operate with maximum instantaneous bandwidth.
Onboard	Refers to the value of the LO Source property. A value of Onboard configures the hardware to use the PXIe-5842 LO on an associated PXIe-5655.