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Find the *National Instruments PXI-5661* at our website: *Click HERE*

GETTING STARTED GUIDE

NI PXI-5661

2.7 GHz RF Vector Signal Analyzer with Digital Downconversion

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

This document explains how to install, configure, and test the NI PXI-5661 (NI 5661). The NI 5661 is a modular 2.7 GHz RF vector signal analyzer (VSA) with wide real-time bandwidth and digital downconversion. The NI 5661 ships with the NI-RFSA instrument driver, which you use to program the device.

The NI 5661 comprises the following devices:

- NI PXI-5600 (NI 5600) RF downconverter module
- NI PXI-5142 (NI 5142) IF digitizer module

Caution The protection provided by this product may be impaired if it is used in a manner not described in this document.

Hot Surface If the NI 5661 has been in use, it may exceed safe handling temperatures and cause burns. Allow the NI 5661 to cool before removing it from the chassis.

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NATIONAL INSTRUMENTS

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

Caution To ensure the specified EMC performance, operate this product only with shielded cables and accessories.

Caution To ensure the specified EMC performance, the length of all I/O cables must be no longer than 3 m (10 ft).

Verifying the System Requirements

To use the NI-RFSA instrument driver, your system must meet certain requirements.

For more information about minimum system requirements, recommended system, and supported application development environments (ADEs), refer to the product readme, which is available on the driver software media or online at *ni.com/updates*.

Unpacking the Kit

Caution 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.

   Caution Never touch the exposed pins of connectors.

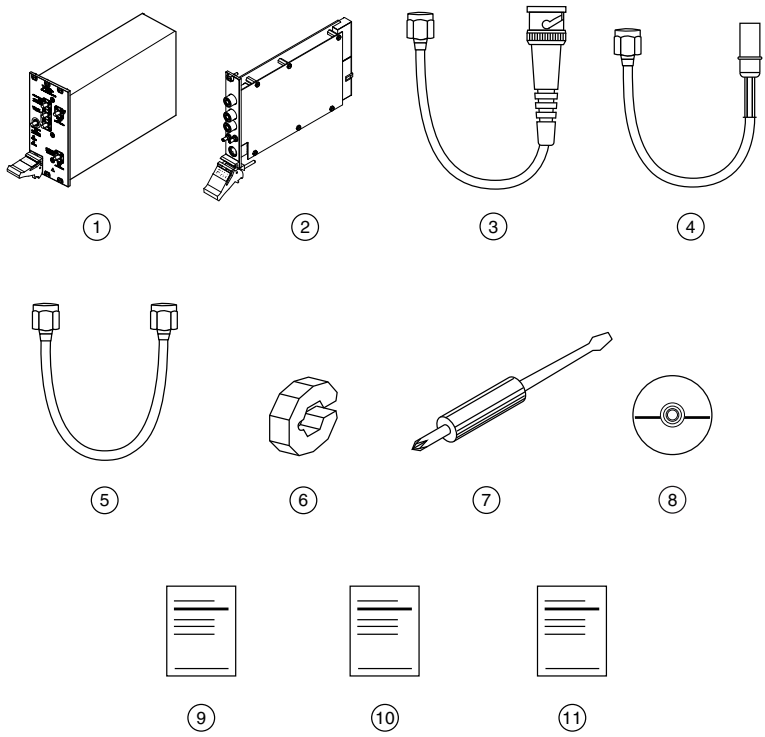
   Notify NI if the device appears damaged in any way. Do not install a damaged device.
3. Unpack any other items and documentation from the kit.

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

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Verifying the Kit Contents

Figure 1. NI 5661 Kit Contents



1. NI 5600 RF Downconverter Module
2. NI 5142 IF Digitizer Module
3. Semi-Flexible SMA-to-BNC Cable, Part Number 192975B-01
4. Semi-Flexible SMA-to-SMB Cable, Part Number 192973B-01
5. Semi-Flexible SMA-to-SMA Cable, Part Number 150611A-01
6. Cable Wrench (x2)
7. Screwdriver, Part Number 772006-01
8. Driver Software DVD
9. Read Me First: Safety and Electromagnetic Compatibility
10. Maintain Forced-Air Cooling Note to Users
11. NI PXI-5661 Getting Started Guide (This Document)

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Other Equipment

There are several required items not included in your device kit that you need to install or operate the NI 5661.

Required Items

- A PXI chassis and chassis documentation. The NI PXI-1045 chassis is one available option for your device. For more information about compatible chassis options, refer to *ni.com*.
- A PXI embedded controller or MXI controller system that meets the system requirements specified in this guide and chassis documentation.

Optional Items

- A 1 N · m standard SMA torque wrench (NI part number 780487-01).

Preparing the Environment

Ensure that the environment you are using the NI 5661 in meets the following specifications.

Operating ambient temperature.....0 °C to 50 °C
(IEC-60068-2-1, IEC-60068-2-2)

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

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

Pollution Degree.....2

Indoor use only.

Caution 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.

Note Refer to the *NI PXI-5661 Specifications* at *ni.com/manuals* for complete specifications.

Installing the Software

You must be an Administrator to install NI software on your computer.

1. Install an ADE, such as LabVIEW or LabWindows™/CVI™.
2. Insert the driver software media into your computer. The installer should open automatically.

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If the installation window does not appear, navigate to the drive, double-click it, and double-click `autorun.exe`.

3. Follow the instructions in the installation prompts.

Note Windows users may see access and security messages during installation. Accept the prompts to complete the installation.

4. When the installer completes, select **Restart** in the dialog box that prompts you to restart, shut down, or restart later.

Installing the NI 5661

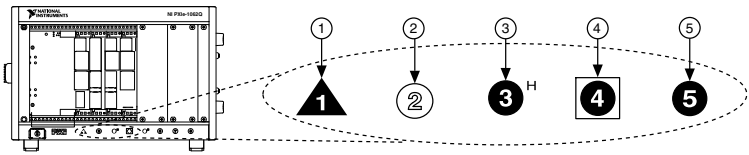
Caution To prevent damage to the device caused by ESD or contamination, handle the device using the edges or the metal bracket.

1. Ensure the AC power source is connected to the chassis before installing the modules.

   The AC power cord grounds the chassis and protects it from electrical damage while you install the modules.

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 connectors 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 2. Chassis Compatibility Symbols



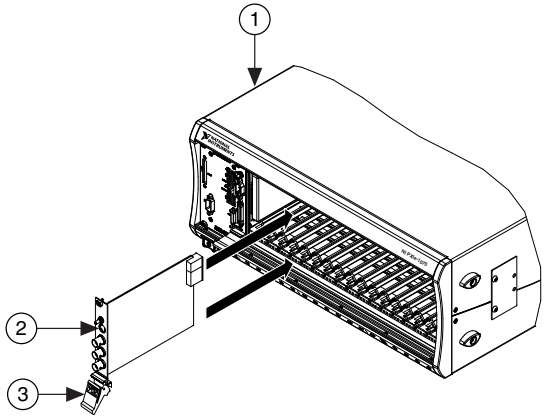
1. PXI Express System Controller Slot
2. PXI Peripheral Slot
3. PXI Express Hybrid Peripheral Slot
4. PXI Express System Timing Slot
5. PXI Express Peripheral Slot

NI 5661 modules can be placed in PXI peripheral slots or PXI Express Hybrid peripheral slots.

6. Touch any metal part of the chassis to discharge static electricity.
7. Ensure that the ejector handle is in the unlatched (downward) position.
8. Place the module edges into the module guides at the top and bottom of the chassis. Slide the device into the slot until it is fully inserted.

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Figure 3. Module Installation



1. Chassis
2. Hardware Module
3. Ejector Handle in Down (Unlatched) Position

9. Latch the module in place by pulling up on the ejector handle.
10. Secure the device 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 filler panels or slot blockers to maximize cooling air flow.
12. Power on the chassis.

Related Information

Installing the Software on page 4

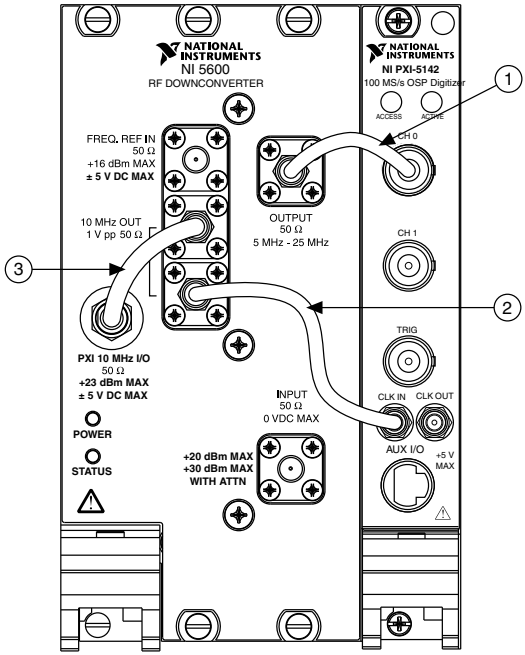
Interconnecting the NI 5661 Modules

Caution The signal pins of this product's input/output ports can be damaged if subjected to ESD. To prevent damage, remove power from the product before

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connecting cables and employ industry-standard ESD prevention measures during installation, maintenance, and operation.

Figure 4. NI 5661 Front Panel Interconnection



1. Semi-Flexible SMA-to-BNC Cable
2. Semi-Flexible SMA-to-SMB Cable
3. (Optional) Semi-Flexible SMA-to-SMA Cable

1. Using the short semi-flexible SMA-to-BNC coaxial cable, connect the OUTPUT connector on the NI 5600 front panel to the CH 0 connector on the NI 5142 front panel.
2. Using the long semi-flexible SMA-to-SMB coaxial cable, connect the lower of the two 10 MHz OUT connectors on the NI 5600 front panel to the CLK IN connector on the NI 5142 front panel.
3. (Optional) Using the semi-flexible SMA-to-SMA coaxial cable center pin, connect the bidirectional PXI 10 MHz I/O connector on the NI 5600 front panel to the other 10 MHz OUT connector on the NI 5600 front panel. This connection drives the PXI 10 MHz backplane with the NI 5600 onboard frequency reference.

   Note You can use this connection to drive the PXI 10 MHz backplane clock only when the NI 5600 RF downconverter module is installed in Slot 2 of a PXI chassis.
4. Hand-tighten all SMA cable ends on the SMA connectors after the cable center pins are correctly aligned and connected. The cable connectors should tighten without much torque or effort. If a cable bends due to incorrect alignment, remove the cable from the

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front panel connector and reconnect the cable center pin on the SMA cable to the SMA connector.

5. Carefully complete tightening all SMA connectors to 1 N · m using an appropriate torque wrench (not included) or torque screwdriver and SMA driver bit. Tighten only until the wrench clicks.

   Caution Incorrect torque at SMA connections can degrade signal fidelity and phase-locked loop (PLL) performance and may cause insertion loss. Use an appropriate torque wrench or torque screwdriver and SMA driver bit to ensure all SMA connections are properly torqued. SMA connectors for connections to external equipment may require torque different from 1 N · m, depending on the connector type, material, and manufacturer.

6. Power on the PXI chassis and controller system.
7. Verify that the POWER LED on the NI 5600 RF downconverter module is on.

Related Information

Troubleshooting on page 18

If an issue persists after you complete a troubleshooting procedure, contact NI technical support or visit *ni.com/support*.

Direct Connections to the NI 5600

The NI 5600 is a precision RF instrument that is sensitive to ESD and transients. Ensure you are making proper direct connections to the NI 5600 to avoid damaging the device.

Caution Apply external signals only while the NI 5600 is powered on. Applying external signals while the device is powered off may cause damage.

- Ensure you are properly grounded when manipulating cables or antennas connected to the NI 5600 INPUT connector.
- If you are using noninsulated devices, such as a noninsulated RF antenna, ensure the devices are maintained in a static-free environment.
- If you are using an active device, such as a preamplifier or switch routed to the NI 5600 INPUT connector, ensure that there are no signal transients greater than the RF and DC specifications for the device that are being generated and sourced to the NI 5600 INPUT connector.

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NI 5600 RF Downconverter Module Front Panel

The NI 5600 RF downconverter module front panel contains six connectors and two LEDs.

Figure 5. NI 5600 RF Downconverter Module Front Panel

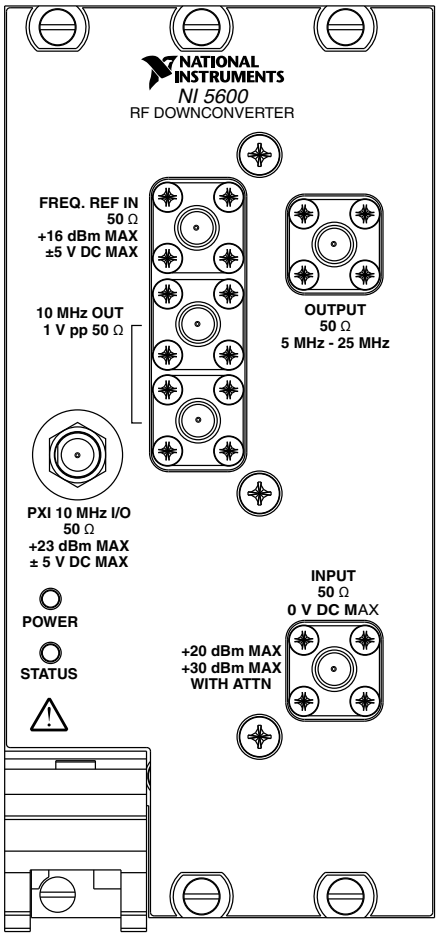


Table 1. Device Front Panel Icon Definition

⚠	Refer to the user documentation for required maintenance measures to ensure user safety and/or preserve the specified EMC performance.

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Table 2. NI 5600 RF Downconverter Module Front Panel Connectors

Connector	Use
FREQ REF IN	Routes an external frequency reference signal to which the NI 5600 can lock. You can propagate this signal to the PXI backplane when the NI 5600 is installed in PXI Slot 2.
10 MHz OUT (two connectors)	Generates replications of the downconverter 10 MHz frequency reference signal. These replicated signals are useful for driving other devices. Each replication is 180° out of phase with the other. The signal output at these connectors is always on and cannot be disabled. Connect the lower 10 MHz OUT connector to the REF CLK IN connector on the NI 5620 module front panel or to the CLK IN connector on the NI 5142.
PXI 10 MHz I/O	Provides bidirectional connection to the PXI 10 MHz backplane clock. You can use this connector to drive the PXI 10 MHz backplane clock only when the NI 5600 is installed in PXI Slot 2. You can use this connector to export the PXI 10 MHz backplane clock when the NI 5600 RF downconverter is installed in any PXI slot.
OUTPUT	Connects to the INPUT connector on the NI 5142 IF digitizer module front panel. This connector is the output terminal for the frequency-translated IF signal for digitization.
INPUT	Connects to the analog RF input signal to be measured by the NI 5661.

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Table 3. NI 5600 RF Downconverter Module Front Panel LEDs

LED	Indications
POWER	Indicates the basic hardware power status of the NI 5600 RF downconverter module. This LED functions identically to the ACCESS LED on the NI 5142 IF digitizer module front panel. OFF—The module is not yet functional, or has detected a problem with a power rail. GREEN—The module is functional and receiving power.
STATUS	Indicates the status of the NI 5600 RF downconverter module PLLs. OFF—The module is in an uninitialized state, or the module PLLs are attempting to lock. GREEN—The module is in a ready state; applicable PLLs are locked.

Related Information

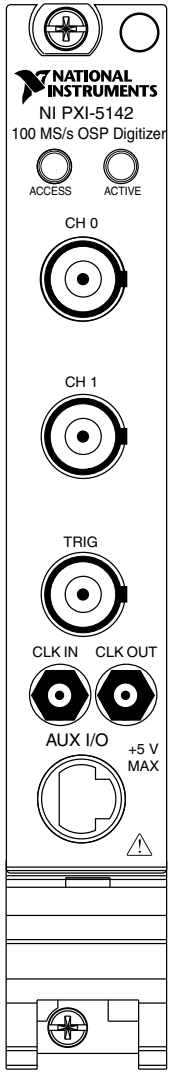
Refer to the NI RF Vector Signal Analyzers Help for more information about using the PXI 10 MHz I/O connector.

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NI 5142 IF Digitizer Module Front Panel

The front panel of the NI 5142 IF digitizer module contains six connectors and two LEDs.

Figure 6. NI 5142 IF Digitizer Module Front Panel



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Table 4. Device Front Panel Icon Definition

	Refer to the user documentation for required maintenance measures to ensure user safety and/or preserve the specified EMC performance.

Table 5. NI 5142 IF Digitizer Module Front Panel Connectors

Connector	Use
CH 0	Connects to the OUTPUT connector on the NI 5600 front panel. This connector is the input terminal for a frequency-translated IF waveform from the NI 5600 RF downconverter for digitization and measurement.
CH 1	This input terminal is not used for NI 5661 operation. CH 0 is the only channel with digital downconverter (DDC) capabilities.
TRIG	This connector is the input terminal for a digital trigger from an external source.
CLK IN	Connects to the lower 10 MHz OUT connector on the NI 5600 RF downconverter module front panel. This connector is the input terminal for the NI 5600 internal Reference Clock signal.
CLK OUT	This connector is the output terminal for the NI 5142 Reference Clock or Sample Clock.
AUX I/O	Provides access to the multipurpose digital timing and triggering lines, PFI 0, and PFI 1 (with optional cable).

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Table 6. NI 5142 IF Digitizer Module Front Panel LEDs

LED	Indications
ACCESS	Indicates the basic hardware status of the NI 5142 module. OFF—The module is not yet functional, or the module detected a problem with a power rail. AMBER—The module is being accessed. *Accessed* means that the device setup registers are being written to in order to control the device. GREEN—The module is ready to be programmed by NI-RFSA.
ACTIVE	Indicates the NI 5142 module state. OFF—The module is not armed, triggered, or acquiring a waveform. AMBER—The module is armed and waiting for a trigger. GREEN—The module has received a Reference Trigger. Also indicates that the module is acquiring a waveform. RED—The module has detected an error. The LED remains red until the error condition is removed.

Related Information

Refer to the NI High-Speed Digitizers Help for more information about triggering.

Configuring the NI 5661 in MAX

Use Measurement & Automation Explorer (MAX) to configure your National Instruments hardware. MAX informs other programs about which devices reside in the system and how they are configured. MAX is automatically installed with NI-RFSA.

1. Launch MAX.
2. In the configuration tree, double-click **Devices and Interfaces** to see the list of installed devices.

   Note If you are using the NI 5661 with the LabVIEW Real-Time Module, expand **Remote Systems**. Find your target IP address or name, expand it, and then expand **Devices and Interfaces**.

   Installed devices appear under the name of their associated chassis.
3. Expand your **Chassis** tree item.

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MAX lists all devices installed in the chassis. Your default device names may vary.

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

4. Record the device identifier MAX assigns to the hardware. Use this identifier when programming the NI 5661.
5. Associate the hardware modules that comprise your device.
   a) Select the NI 5600 that appears as not configured in the configuration tree.
   b) In the Associated Devices section, select the appropriate module from each system component drop-down listbox.

      For the NI 5661, you must associate the NI 5142 IF digitizer module with the NI 5600 RF downconverter.
   c) Click **Save** in the MAX toolbar.

Note Module associations may be lost when you move the modules to different chassis slots.

6. Self-test the device modules by selecting the modules in the configuration tree, and clicking **Self-Test** in the MAX toolbar. Repeat this step for all modules in your NI 5661 system.

   The MAX self-test performs a basic verification of hardware resources.

Related Information

Troubleshooting on page 18

If an issue persists after you complete a troubleshooting procedure, contact NI technical support or visit *ni.com/support*.

Refer to the NI RF Vector Signal Analyzers Help for more information about renaming devices.

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Programming the NI 5661

You can acquire data interactively using the NI-RFSA Soft Front Panel (SFP) or use NI-RFSA to program your device in the ADE of your choice.

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Table 7. NI 5661 Programming Options

Application Programming Interface (API)	Location	Description
NI-RFSA SFP	Available from the Start menu at **Start»All Programs»National Instruments»NI-RFSA»NI-RFSA Soft Front Panel**.	NI-RFSA SFP controls, analyzes, and presents data similar to stand-alone RF vector signal analyzers. The NI-RFSA SFP operates on the PC, so it provides processing, storage, and display capabilities.
NI-RFSA Instrument Driver	LabVIEW—Available on the LabVIEW Functions palette at **Measurement I/O»NI-RFSA**. C or LabWindows/CVI—Available at **Program Files»IVI Foundation»IVI»Drivers»niRFSA**.	NI-RFSA configures and operates the device hardware and acquires and analyzes data using LabVIEW VIs or LabWindows/CVI functions. After you associate the modules of the NI 5661 in MAX, NI-RFSA operates the modules as a single instrument.
	Microsoft Visual C/C++—Use examples located in the *<NIDocDir>*`\NI-RFSA\examples` directory, where *<NIDocDir>* is one of the following directories: • Windows 8/7/Vista—`Users\Public\Public Documents\National Instruments` • Windows XP—`Documents and Settings\All Users\Documents\National Instruments`	You can modify an NI-RFSA example to create an application with Microsoft Visual C/C++, and all required include and library files are automatically added to the project.

Related Information

Refer to the Getting Started with NI-RFSA section of the NI RF Vector Signal Analyzers Help for detailed instructions about how to acquire data in a specific ADE.

Refer to the Creating an Application with Microsoft Visual C and C++ topic of the NI RF Vector Signal Analyzers Help if you prefer to manually add all required include and library files to the project.

NI-RFSA Examples

Examples demonstrate the functionality of the device and serve as programming models and building blocks for your own applications. The NI Example Finder is a utility available for

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some ADEs that organizes examples into categories and allows you to easily browse and search installed examples. You can see descriptions and compatible hardware models for each example or see all the examples compatible with one particular hardware model.

Table 8. Locating NI-RFSA Examples

ADE	How to Locate Examples
LabVIEW or LabWindows/CVI	Locate examples with the NI Example Finder. Within LabVIEW or LabWindows/CVI, select **Help»Find Examples** and navigate to **Hardware Input and Output»Modular Instruments**.
ANSI C or Microsoft Visual C/C++	Locate examples in the *<NIDocDir>*\NI-RFSA\examples directory, where *<NIDocDir>* is one of the following directories: • Windows 8/7/Vista—Users\Public\Public Documents\National Instruments • Windows XP—Documents and Settings\All Users\Documents\National Instruments

Troubleshooting

If an issue persists after you complete a troubleshooting procedure, contact NI technical support or visit *ni.com/support*.

Installation

What Should I Do if the NI 5600 RF Downconverter Module Front Panel POWER LED is Off When the PXI Chassis is On?

If the POWER LED fails to light after you power on the PXI chassis, a problem may exist with the PXI power rail, a hardware module, or the LED.

1. Disconnect any signals from the PXI module front panel.
2. Power off the PXI chassis.
3. Remove the module from the PXI chassis and inspect it for damage. Do not reinstall a damaged device.
4. Reinstall the module in a different PXI chassis slot.
5. Power on the PXI chassis.
6. Verify that the device appears in MAX.
7. Reset the device in MAX and perform a self-test.

Why Is the ACCESS LED Off When the Chassis is On?

The LEDs may not light until the device has been configured in MAX. Before proceeding, verify that the NI 5661 appears in MAX.

If the ACCESS LED fails to light after you power on the chassis, a problem may exist with the chassis power rails, a hardware module, or the LED.

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Caution Apply external signals only while the NI 5661 is powered on. Applying external signals while the device is powered off may cause damage.

1. Disconnect any signals from the module front panels.
2. Power off the chassis.
3. Remove the module from the chassis and inspect it for damage. Do not reinstall a damaged device.
4. Reinstall the module in a different chassis slot.
5. Power on the chassis.
6. Verify that the device appears in MAX.
7. Reset the device in MAX and perform a self-test.

What Should I Do if the NI 5661 Doesn't Appear in MAX?

1. In the MAX configuration tree, click **Devices and Interfaces**.
2. Expand the **Chassis** tree to see the list of installed devices, 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.

Operating System	Description
Windows 8	Right-click the Start screen, and select **All apps»Control Panel» Hardware and Sound»Device Manager**.
Windows 7	Select **Start»Control Panel»Device Manager**.
Windows Vista	Select **Start»Control Panel»System and Maintenance»Device Manager**.
Windows XP	Select **Start»Control Panel»System»Hardware»Device Manager**.

5. If you are using a PXI controller, verify that a **National Instruments** entry appears in the system device list. Reinstall NI-RFSA and the device if error conditions appear in the list. If you are using an MXI controller, right-click **PCI-to-PCI Bridge**, and select **Properties** from the shortcut menu to verify that the bridge is enabled.

What Should I Do if the Module 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.

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Configuration

What Should I Do if the Device Does Not Initialize?

Failure to initialize may indicate a problem with module interconnections or with MAX. If the niRFSA Initialize VI or the `niRFSA_init` function returns an error and the NI 5661 fails to initialize, complete the following steps:

1. Reconnect the NI 5661 hardware module front panel cables securely.
2. Power on your system and run the MAX configuration and self-test procedures.

Related Information

Interconnecting the NI 5661 Modules on page 6
Configuring the NI 5661 in MAX on page 14

What Should I Do if the NI 5600 RF Downconverter STATUS LED Does Not Light?

If the RF vector signal analyzer is programmed to lock to an external reference source or to the PXI backplane but the STATUS LED light does not indicate a phase-locked status, verify the following items:

1. Verify that a cable is connected from the external source or the PXI 10 MHZ I/O connector to the FREQ REF IN connector.
2. Verify that the external source signal is large enough—typically greater than -10 dBm.
3. Verify the external source signal falls within the specified frequency accuracy.
4. If you programmed the RF vector signal analyzer to use the NI 5600 RF downconverter module internal timebase, verify the following items:
   a) Verify that one or more of the local oscillators is phase-locked if the RF vector signal analyzer measures the frequency incorrectly or detects no signal when one is supplied.
   b) Verify that there is no driver software error and the LED is not damaged if the RF vector signal analyzer measures the frequency correctly but the LED does not light.

What Should I Do if the NI 5142 IF Digitizer Module Does Not Phase-Lock to the RF Downconverter Module?

If the IF digitizer module fails to phase-lock to the NI 5600 RF downconverter module internal reference through the front panel, complete the following steps:

1. Verify that the cable is not faulty and that all cables are connected to the correct terminals.
2. Verify that there is a reference signal output from the NI 5600 10 MHZ OUT front panel connectors.

   If there is no signal at these output terminals, contact NI technical support or visit *ni.com/support*.

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3. If the IF digitizer module fails to phase-lock to the PXI backplane driven by the NI 5600 RF downconverter module internal reference, verify the following items:
   a) Verify that the NI 5600 is in Slot 2 of the PXI chassis, immediately adjoining the PXI controller slot.
   b) Verify that the PXI 10 MHZ I/O connector is securely wired to one of the 10 MHZ OUT connectors using the included cable.
   c) (NI 5600) Verify that in the niRFSA Configure PXI Chassis Clk10 VI, the **PXI Clk10 source** parameter is set to OnboardClock or that in the `niRFSA_ConfigurePXIChassisClk10` function, the PXIClk10Source parameter is set to NIRFSA_VAL_ONBOARD_CLOCK_STR.

If failures continue and there is no signal at these output terminals, there may be a problem with the NOT USED hardware. Contact NI technical support or visit *ni.com/support*.

Related Information

Interconnecting the NI 5661 Modules on page 6

What Should I Do if the NI-RFSA Soft Front Panel Does Not Launch?

1. Verify the front panel interconnections for your RF vector signal analyzer.
2. Verify the MAX device association for your NI 5661.
3. If you have verified the interconnections and associations of your device and you are still unable to launch the NI-RFSA SFP, try uninstalling and then reinstalling NI-RFSA.

Related Information

Interconnecting the NI 5661 Modules on page 6
Configuring the NI 5661 in MAX on page 14

Measurements

What Should I Do if the Device Amplitude Reading Does Not Match the Source?

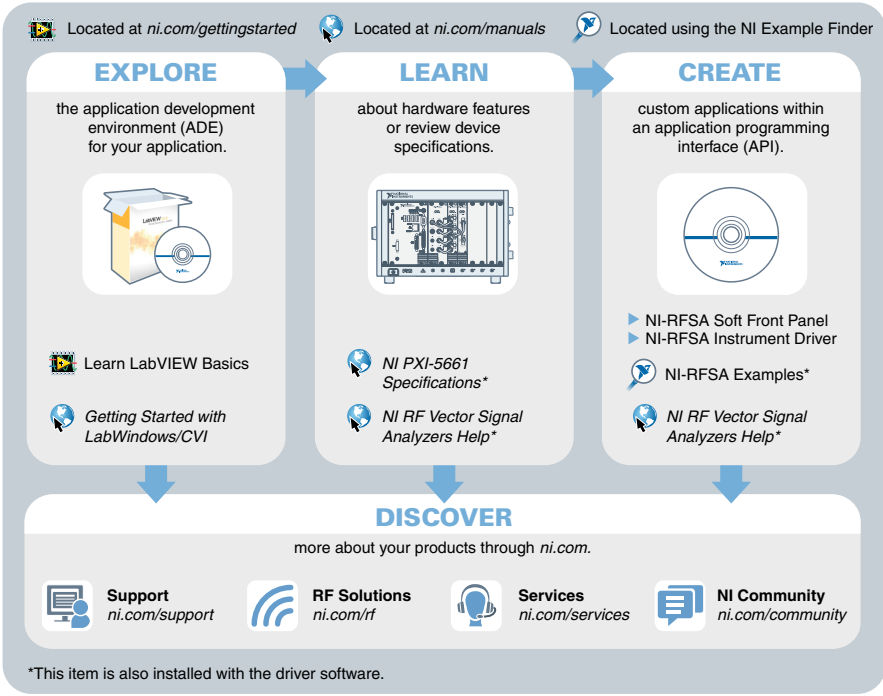
1. Verify that the discrepancy between the NI 5661 and the source is within the error limits of the devices.
   a) Verify the absolute amplitude accuracy of the NI 5661 using the appropriate value.
   b) Verify the level accuracy of the input signal into the receiver.
2. Check for cable loss, which can be substantial. For example, an RG58 coaxial cable loses about 2.1 dB of signal amplitude per foot at 2 GHz. Unless you are using high-quality cables, expect losses when working with high-frequency signals.
3. Perform a self-calibration for the NI 5661.

If errors continue, contact NI technical support or visit *ni.com/support*.

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Where to Go Next

Refer to the following figure for information about other product tasks and associated resources for those tasks.



Tip The *NI RF Vector Signal Analyzers Help* is an HTML version of a traditional user manual that includes detailed information about RF fundamentals, device features, and programming with NI-RFSA.

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376113B-01 Oct14

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