

Keysight M9379A PXIe RF Amplifier



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1 Getting Started

Introduction

The Keysight M9379A PXI RF Amplifier Module includes two amplifiers combined with RF switches and a programmable step attenuator for operation up to 13.5GHz. Input and output ports of internal components can be accessed with the test ports on the front panel, so you can configure your test systems using the module.

The 1-slot module is designed to operate with the M9485A PXIe Vector Network Analyzer (VNA). When combined with the M9377A Direct Receiver Access Module and the M9378A high-power Coupler Module for network analysis, the M9379A's internal amplifier (Amp1) can improve the noise floor of the measurement system. For example, the typical dynamic range can be reached to xx dB with the VNA system, making an ideal solution for high-rejection filter measurements. The amplifier works as a programmable preamplifier containing two user-selectable paths, either an amplifier path with a variable gain using a step attenuator or bypass path.

The other amplifier (Amp2) can be used as a booster amplifier with a fixed gain for the VNA's source. For example, the Amp2 offers up to xx dB of gain and a 1dB compression point of +xx dBm, improving the VNA's output power for high-power S-parameter measurements.

The scope of this Startup Guide is to detail the processes of receiving and installing the RF amplifier module. Additionally, installing the required software is documented. If you have any questions after reviewing this information, please contact your local Keysight Technologies Inc. representative or contact us through our support Website at <http://www.keysight.com/support>.

Related Documentation

You can find all M9379A RF Amplifier module documentation and other resources at: <http://www.keysight.com/support/m9379a> or at the respective product pages on www.keysight.com (go to **Document Library > Manuals**).

STEP 1. Unpack and Inspect the RF Amplifier Modules

CAUTION

The RF amplifier module is shipped in materials which prevent damage from static. The modules should only be removed from the packaging in an anti-static area ensuring that correct anti-static precautions are taken. Store all modules in anti-static envelopes when not in use

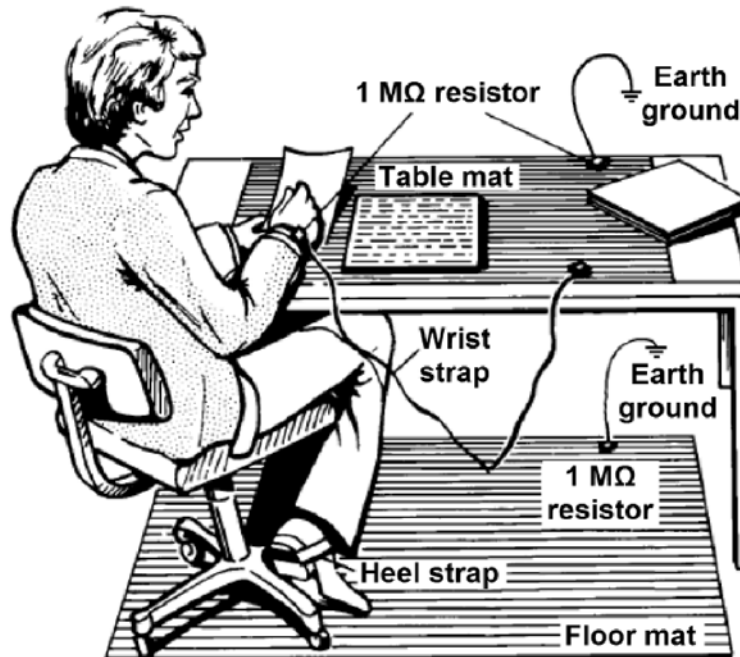
Electrostatic discharge (ESD) can damage or destroy electronic components. Use a static-safe work station to perform all work on electronic assemblies. **Figure 1-1** shows a static-safe work station using two types of ESD protection: conductive table-mat and wrist-strap combination, and conductive floor-mat and heel-strap combination. Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 meg-ohm of isolation from ground.

WARNING

Do NOT use these techniques for a static-safe work station when working on circuitry with a voltage potential greater than 500 volts.

Figure 1-1 ESD protection setup

ESD



M9370_001_101

Unpack the RF amplifier module from the shipping containers. Keep the black plastic port protector and the shipping containers for possible reuse.

Getting Started

STEP 1. Unpack and Inspect the RF Amplifier Modules

Inspect for Damage

After unpacking a RF amplifier module, inspect it for any shipping damage. Report any damage to the shipping agent immediately, as such damage is not covered by the warranty.

CAUTION

To avoid damage when handling the RF amplifier module, do not touch exposed connector pins.

How to Return an Instrument for Service

Should it become necessary to return a RF amplifier module for repair or service, follow the steps below:

1. Review the warranty information shipped with your product.
2. Contact Keysight to obtain a Return Material Authorization (RMA) and return address. For assistance finding Keysight contact information, go to www.keysight.com/find/assist (worldwide contact information for repair and service).
3. Write the following information on a tag and attach it to the RF amplifier module:
 - Name and address of owner. A P.O. box is not acceptable as a return address.
 - RF amplifier module serial numbers. The serial number label is located on the side panel of the module. The serial number can also be read from the Soft Front Panel (SFP) interface, after the hardware is installed.
 - Description of the service required or the failure.
4. On the shipping label, write ATTENTION REPAIR DEPARTMENT and the RMA number.
5. Ship the analyzer module using the original packaging materials. Shipping the analyzer module in anything other than the original packaging may result in non-warranted damage.

NOTE

In your correspondence, refer to the RF amplifier module by serial number and by model number.

Getting Started
STEP 2. Check the Shipment

STEP 2. Check the Shipment

The M9379A consists of several modules, cables and dividers. Use the Contents List in the shipping container to verify the completeness of your shipment. If not complete, refer to **"Contacting Keysight" on page 18**.

STEP 3. Install the RF Amplifier Modules

NOTE

This RF amplifier module can be used in a chassis with a PXIe, or PXI-H chassis slots.

Recommended Best Practices to Ensure Proper and Safe Module Operating Conditions

- Ensure proper chassis air flow is maintained.
- The use of a Keysight M9018A/M9019A chassis is recommended for optimum temperature control. If a different chassis is used, make sure it provides thermal protection if fans become inoperable or forced air cooling is obstructed.
 - If using the Keysight M9018A/M9019A PCIe Cable Interface, download the *Keysight Multiple PXIe and AXIe Chassis System Configuration Tool*. Save the file to your local hard drive; do not try to open the file from the Internet location.
- Use slot blockers and EMC filler panels in empty module slots to ensure proper operating temperatures. Keysight chassis and slot blockers optimize module temperature performance and reliability of test.
- Set chassis fans to high or auto. Do not disable fans.
- Position chassis to allow plenty of space around chassis air intake and fan exhaust.
- At ambient temperatures above 45° C (113° F) set the chassis fan to high.

Figure 1-2 M9018A chassis air flow



The M9018A has multiple air intakes located on the lower sides, lower front and bottom front of chassis.
Fan exhausts through the rear of the chassis

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Tools Required for the Installation Procedure

- Phillips #1 torque driver, set to 4 in-lb (0.45 N.m) - not supplied.
- Socket adapter (part number M9485-23001) - supplied.

Getting Started

STEP 3. Install the RF Amplifier Modules

- Torque driver (for use with socket adapter), set to 8 in-lb (0.91 N.m) - not supplied.
- Cable removal tool (part number 5002-3361) - supplied.
- Torque Wrench for SMA, set to 8 in-lb (0.91 N.m) - not supplied.
- 5.5 mm open end wrench - not supplied.

Installation Procedure

CAUTION

PXI hardware does not support “hot-swap” (changing network analyzer modules while power is applied to the chassis) capabilities. Before installing or removing a module to/from the chassis, power-off the chassis to prevent damage to the module



The RF Amplifier modules can be installed in any PXIe or hybrid PXI slot marked with a peripheral slot compatibility image (solid black circle for PXIe, or solid black circle with the letter “H” for hybrid).

NOTE

If you use this module with M9485A, the sync signal should be connected, Refer to M9485A Help.

NOTE

Cables to connect with the modules in M9485A should be provided by customers.

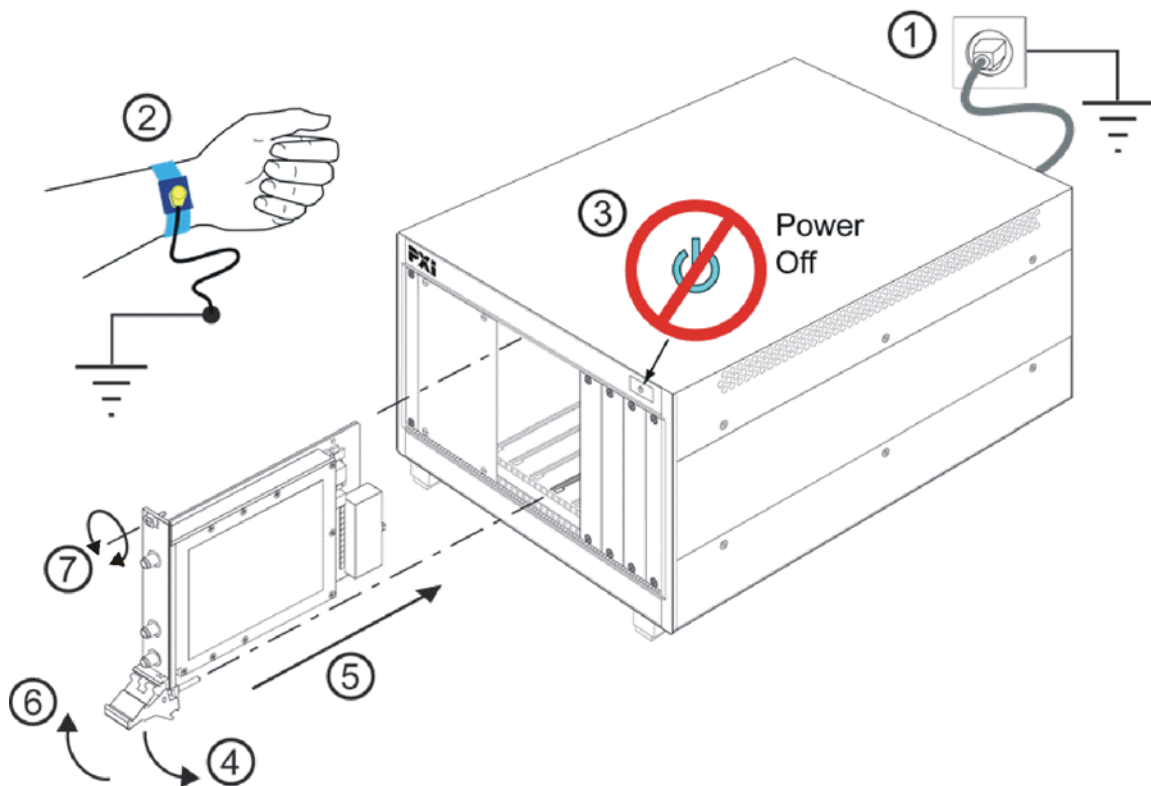
1. Make sure that the line cord is plugged in to establish earth ground and that the chassis power switch is Off (see callouts 1 and 3 in [Figure 1-3 on page 11](#)).
2. Wear a grounded wrist strap for this procedure (see callout 2 in [Figure 1-3 on page 11](#)).
3. If the chassis has multiple fan speed settings, ensure that the fan switch is set to high or auto.
4. Position the chassis to provide ample space between the chassis fan intake and exhaust vents. Blockage by walls or obstructions affects the air flow needed for cooling. (Refer to the chassis documentation for more information about cooling.)
5. Before inserting the RF Amplifier module into the chassis, back-out the top mounting screw (see callout 7 in [Figure 1-3 on page 11](#)) on the module to ensure that there is no interference between the screws and the mounting rails.

Getting Started

STEP 3. Install the RF Amplifier Modules

6. Holding the module by the injector/ejector handle, slide it into a slot, as shown in callouts 4 – 6 in [Figure 1-3 on page 11](#).
 - a. Install the module into the slot of the chassis by placing the module card edges into the front module guides (top and bottom).
 - b. Hold down the silver locking tab while pushing down the injector/ejector handle to the unlatched (downward) position, and slide the module to the rear of the chassis.
 - c. Slide the module completely into the chassis. When you begin to feel resistance, pull up on the injector/ejector handle to fully inject the module into the chassis. The injector/ejector handle should lock into place. (To remove the module from the chassis, you must first press the injector/ejector handle to unlock it.)

Figure 1-3 Installing the RF Amplifier Module



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7. Repeat for other modules, if present.
8. Modules should be installed from left to right and not otherwise.
9. When placing all the modules by the sequence, place the screws at the top and bottom of each module but keep all the screws loose until all module are properly placed.

Getting Started
STEP 3. Install the RF Amplifier Modules

CAUTION

When connecting or disconnecting a cable to the module, do not touch the end of the cable. Doing so may damage the module by electrostatic discharge (ESD).

STEP 4. Install the Software

System Requirements

Topic	Windows 7 and Vista Requirements
Operating system	Windows 7 (32 bit and 64 bit) or Windows 8.1 (32-bit and 64-bit) or Windows 10 (32-bit and 64-bit)
Processor speed	1.5 GHz dual core (x86 or x64) minimum (2.4 GHz recommended)
Available memory	4 GB minimum (8 GB recommended)
Available disk space	1.5 GB available hard disk space minimum
Display	1280 x 930 recommended

Hardware Requirements

Topic	Requirements
Chassis	PXle or PXI-H chassis slot
Controllers	PXle embedded controller or remote controller (external PC connected to the chassis by a PCI-to-PXI interface) is required.
Embedded controller	Keysight M903xA or an equivalent embedded controller that meets the following requirements: <ul style="list-style-type: none">• A PXle system controller (PXI-1 embedded controllers are not compatible).• Utilizes a 2x8, 4x4, or 1x8 PXle system slot link configuration.• Runs one of the operating systems listed in System Requirements (above).
Remote controller	(For Keysight M9018A/M9019A chassis use only) A PC running one of the operating systems listed in System Requirements and a Keysight M9021A Cable Interface x8 with one of the following PC interface options: <ul style="list-style-type: none">• Keysight M9045B PCIe ExpressCard Adaptor x1, with cable (for a laptop PC)• Keysight M9048B PCIe Desktop Adaptor x8, with cable (for a desktop PC)

Getting Started

STEP 4. Install the Software

Power Up the Controller

If you are using a remote controller, complete the following steps:

1. Install the cable interface between the remote controller and the chassis. If you are using an Keysight M9021A cable interface, refer to the Keysight M9021A documentation for further details.
2. Power up the chassis.
3. Power up the PC.

CAUTION

If you are using a remote controller and you have installed the interface cable, you must power up the chassis BEFORE you power up the PC.

When you power down your system, shut down the PC BEFORE you power down the chassis.

If you are using an embedded controller, complete the following steps:

1. Install the embedded controller module into a compatible chassis. The Keysight M9018A and M9019A PXIe chassis is recommended. Refer to the Keysight M9018A and M9019A documentation for further details.
2. Connect peripherals (mouse, keyboard, monitor).
3. Power up the chassis.

Software Installation Overview

The software installation includes the following items:

- Keysight IO Libraries Suite (IOLS), which includes the Keysight Connection Expert. This software is included with your shipment and the latest version is available at www.keysight.com/find/iosuite. This software must be installed first.

NOTE

Version 17.1 (or newer) of the Keysight IO Libraries Suite is required.

- If you are using the M9379A as standalone, install the M9379A driver from Keysight.com. The M9379A driver is available at <http://www.keysight.com/support/m9379a>.
- If you are using M9379A with M9485A, install Network analyzer software, which includes the soft front panel (SFP) software, device drivers (IVI-C and IVI-COM, and LabVIEW G), and documentation for the M9485A PXIe Vector Network Analyzer. This software is available at <http://www.keysight.com/support/m9485a>.

Getting Started

STEP 4. Install the Software

- PXIe Chassis Drivers, which includes IVI-C (32-bit/64-bit), IVI-COM (32-bit/64-bit), MATLAB (32-bit only), LabVIEW (32-bit/64-bit) for M9018A/M9019A. This software is pre-installed on the M9037A Embedded Controller and also available at <http://www.keysight.com/support/m9018a> and <http://www.keysight.com/support/m9019a>

Software Installation Procedure

1. Install the Keysight IO Libraries Suite, using either the Keysight IO Libraries Suite CD included with your shipment, or the downloadable file at www.keysight.com/find/iosuite. Follow the installer prompts to install the IO libraries.
2. If you use M9379A as standalone, install the M9379A RF amplifier module driver:
 - a. Using the downloadable file at <http://www.keysight.com/support/m9379a>, launch the installer.
 - b. Follow the installer prompts.
3. If you use M9379A with M9485A, install the network analyzer module software:
 - a. Using the downloadable file at <http://www.keysight.com/support/m9485a>, launch the installer.
 - b. Follow the installer prompts.
4. If using a remote controller, install the PXIe Chassis Drivers
 - a. Using the downloadable file at <http://www.keysight.com/support/m9018a> and <http://www.keysight.com/support/m9019a>, launch the installer.
 - b. Follow the installer prompts.
5. Complete the installation:
 - If Using an Embedded Controller:
 - a. After the InstallShield Wizard has completed, click Finish.
 - b. Restart the embedded controller PC, using Start > Restart, and wait for the system to restart.
 - If Using a Remote Controller:
 - a. After the InstallShield Wizard has completed, click Finish.
 - b. Shut down the remote controller PC, using Start > Shut down.
 - c. Power down the chassis.
 - d. Power up the chassis.

Getting Started
STEP 4. Install the Software

- e. Power up the remote controller PC.

NOTE

Check for software updates at: <http://www.keysight.com/support/m9379a>.

2 Getting Help with Your RF Amplifier Module

Help System

Use the Help System to quickly reference programming and user documentation

To access Help:

- If you use the M9379A as standalone,
 - On your PC screen, click the M9379 SFP icon.
 - Click **Help**.
- If you use the M9379A with M9485A,
 - On your PC screen, click the Network Analyzer icon.
 - After making your analyzer module configuration settings, click **Help**.
- Online Help is available on Keysight.com, go to <http://www.keysight.com/manuals/m9485a>.

NOTE

45-minute warm up time is required to meet the specification accuracy. Not only chassis power-on but also turning on the amplifiers by software (PXI VNA firmware, Soft Front Panel or IVI-driver) are required for warm up.

Contacting Keysight

Assistance with test and measurements needs and information on finding a local Keysight office are available on the Web at:

www.keysight.com/find/assist.

If you do not have access to the Internet, please contact your Keysight field engineer.

NOTE

In any correspondence or telephone conversation, refer to the Keysight product by its model number and full serial number. With this information, the Keysight representative can determine whether your product is still within its warranty period.

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