VXG Signal Generator

M9484C VXG Vector Signal Generator

This manual provides documentation for the M9484C running the Microsoft Windows 10 operating system.

KEYSIGHT

STARTUP GUIDE

Notices

Trademark Acknowledgments

n/a

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CAUTION

A **CAUTION** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A **WARNING** notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Where to Find the Latest Information

Documentation is updated periodically. For the latest information about this product, including instrument software upgrades, application information, and product information, browse to the following URL:

https://www.keysight.com/us/en/product/M9484C/m9484c.html

Information on preventing instrument damage can be found at:

http://keysight.com/find/PreventingInstrumentRepair

Is your product software up-to-date?

Periodically, Keysight releases software updates to fix known defects and incorporate product enhancements. To search for software updates for your product, go to the Keysight Technical Support website at:

http://www.keysight.com/find/techsupport

Product and Solution Cybersecurity

Keysight complies with multinational regulations for the cybersecurity of its own products and is committed to providing information to assist you in protecting your products and solutions from external cyber threats. For more information, see:

https://www.keysight.com/us/en/about/quality-and-security/security/product-and-solution-cyber-security.html

Keysight also recommends that you secure your IT environments using appropriate third-party tools. For instruments that run the Microsoft Windows operating system, Keysight concurs with Microsoft's recommendations for ensuring that the instrument is protected:

- Get the latest critical Windows updates

- For network-connected instruments, use an Internet firewall (in Keysight instruments, Windows Firewall is enabled by default)

- For network-connected instruments, use up-to-date antivirus and anti-spyware software

Responsible Disclosure Program

Keysight recommends that security researchers share the details of any suspected vulnerabilities across any asset owned, controlled, or operated by Keysight (or that would reasonably impact the security of Keysight and our users) using this form:

https://www.keysight.com/us/en/contact/responsible-disclosure-program.html

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If you discover a cybersecurity issue that you suspect may involve Keysight's proprietary software, or third-party software supplied by Keysight as part of a product, or that may affect the operation of Keysight products, we encourage you to report it to us using this form:

https://www.keysight.com/us/en/about/quality-and-security/security/product-and-solution-cyber-security/report-a-product-cybersecurity-issue

1. Quick Start
Protecting against electrostatic discharge . . . 10
Test Equipment and ESD . . . 10
Additional Information About ESD . . . 10
Unpack and Inspect the Instrument . . . 11
Verify M9484C Shipment Contents . . . 12
Shipping Problems? . . . 12
Prepare the Hardware . . . 15
Redundant Ground for 100/120V 400 Hz and 220/240V 60 Hz Operation . . . 15
Prepare and Power Up the Instrument . . . 17
Verify Operation of the Signal Generator . . . 18
Run a Self Test . . . 18
Run Alignments . . . 19
Generate and View an Output Signal . . . 21
Shutting Down the Instrument . . . 23
Related Documentation . . . 24

2. Front and Rear Panel Features
Front Panel Features . . . 26
One Channel Instruments . . . 26
Two Channel Instruments . . . 47
Four Channel Instruments . . . 70
Rear-Panel Features . . . 76
Option 001 or Option 001 + 002 (1 or 2 Channels) . . . 76
Options 001 + 002 + 003 + 004 (4 Channels) . . . 79

3. Instrument Operating System
Installed Software . . . 82
Microsoft Windows . . . 82
Instrument Software . . . 82
Is Your Product Software Up-To-Date? . . . 82
VXG Licensing Options . . . 83
Fixed Licenses . . . 83
Transportable Licenses . . . 83
Network Licenses . . . 83
USB Portable Licenses . . . 84
Configuring Network and USB Licenses . . . 84
User Installation of Software . . . 86
Installation of Other 3rd Party Software . . . 86
User Accounts and Passwords . . . 87

User Creation of Accounts 87
Windows Configuration 88
Settings That Can Be Changed 88
Settings That Must Not Be Changed 89
Autoplay/Autorun 90
Configuring LAN 91
Hostname 91
IP Address & Gateway 91
Connecting to a Network Shared Folder 91
Windows Security 93
Windows Firewall 93
Automatic Updates 93
Virus Protection 94
Spyware Protection 94
Installing and Using an FTP Server on Windows 10 95
To Install an FTP Server 95
To Configure an FTP Site 96
To Allow an FTP Server Through Windows Firewall 99
System Maintenance 101
Backup 101
System Restore 101
Disk Defragmenting 101
USB Connections 102
Disk Drive Partitioning and Use 103
Disk Drive Recovery Process 104
Updating the Software (required after a recovery) 106

4. Using Windows Tools

Navigating Windows Without a Mouse 108
Remote Desktop: Using the Signal Generator Remotely 109
Overview of Remote Desktop operation 109
Enabling Copy and Paste or File Sharing 109
Setting Up Remote Desktop Operation On the Instrument 111
How to Locate the Computer Name of the Instrument 112
Running a Remote Desktop Session 113
Windows Shortcuts and Miscellaneous Tasks 117
Windows Shortcuts (key combinations) 118
Windows Taskbar Auto-hide Feature 119

5. Removable Solid State Drive (SSD)

Overview . . . 122
Putting the Additional SSD Into Service . . . 123
SSD Interconnect Life Expectancy . . . 124
SSD Removal and Installation . . . 125
Firmware Updates . . . 126
Instrument Security Information . . . 127

6. Safety and Maintenance Information
Safety Information . . . 130
Warnings, Cautions, and Notes . . . 131
General Safety Considerations. . . . 132
Before Applying Power . . . 132
Servicing . . . 135
Operating Conditions . . . 135
Instrument Markings . . . 136
Instrument Maintenance . . . 139
Cleaning the instrument. . . . 139
Cleaning Connectors . . . 139
Returning an Instrument for Service . . . 140
Calling Keysight Technologies . . . 140
Locations for Keysight Technologies . . . 140
Service Options . . . 141
Packaging the Instrument . . . 141

1 Quick Start

Use this guide to unpack and set up the M9484C VXG Millimeter Wave Signal Generator.

The following topics can be found in this section:

"Protecting against electrostatic discharge" on page 10

"Unpack and Inspect the Instrument" on page 11

"Before Applying Power" on page 12

"Prepare and Power Up the Instrument" on page 17

"Verify Operation of the Signal Generator" on page 18

"Generate and View an Output Signal" on page 21

"Shutting Down the Instrument" on page 23

"Related Documentation" on page 24

Protecting against electrostatic discharge

Electrostatic discharge (ESD) can damage or destroy electronic components (the possibility of unseen damage caused by ESD is present whenever components are transported, stored, or used).

Test Equipment and ESD

To help reduce ESD damage that can occur while using test equipment:

WARNING **Do not use these first three techniques when working on circuitry with a voltage potential greater than 500 volts.**

- Before connecting any coaxial cable to an instrument connector for the first time each day, momentarily short the center and outer conductors of the cable together.
- Personnel should be grounded with a 1 MΩ resistor-isolated wrist-strap before touching the center pin of any connector and before removing any assembly from the instrument.
- Be sure that all instruments are properly earth-grounded to prevent build-up of static charge.
- Perform work on all components or assemblies at a static-safe workstation.
- Keep static-generating materials at least one meter away from all components.
- Store or transport components in static-shielding containers.
- Always handle printed circuit board assemblies by the edges. This reduces the possibility of ESD damage to components and prevent contamination of exposed plating.

Additional Information About ESD

For more information about ESD and how to prevent ESD damage, contact the Electrostatic Discharge Association (http://www.esda.org). The ESD standards developed by this agency are sanctioned by the American National Standards Institute (ANSI).

Unpack and Inspect the Instrument

Before unpacking your instrument, inspect the packaging container for evidence of mishandling during transit. Report any damage to the shipping agent immediately, as such damage is not covered by the warranty (refer to the warranty information at the beginning of this document).

Remove the instrument from the packaging container and ensure that all accessories are included. Inspect the instrument and accessories for damage. If the contents appear damaged, notify your local Keysight Technologies Inc. representative.

CAUTION

The instrument is shipped in a container which prevents damage from static. The instrument should only be removed from the packaging in an anti-static area ensuring that correct anti-static precautions are taken. Store the instrument in an anti-static envelope when not in use. See more about electrostatic discharge on page 10**.**

NOTE

Visit www.keysight.com/find/tips for information on preventing damage to your Keysight equipment.

WARNING

Use care when lifting this instrument. Instrument is front heavy. More than one person is required to safely lift or carry this instrument. Alternately a mechanical lift can be used to eliminate the risk of personal injury.

Verify M9484C Shipment Contents

Qty	Keysight Part Number	Description
1	M9484C	M9484C VXG Millimeter Wave Signal Generator
1	M9484-90004	Quick Start Poster
1	5061-7383	South Korean Class A EMC Declaration
1	5991-3402	End User License Agreement
1	9320-6691	China RoHS Addendum for Signal Generator
1	9320-6797	Keysight Safety Leaflet
1 each	83059B[a] 83059C[a]	Adapter, 3.5 mm (f) to (f) Adapter, 3.5 mm (m) to (f)
1	M9484-00001	Guard, jumper cables, front
1	M9484-00002	Guard, jumper cables, rear

a. For Option 520 only, each channel of the M9484C VXG includes one 83059B adapter and one 83059C adapter to help interface with the 3.5 mm (m) RF output.

Instrument Weight

36.7 kg (approximately)

Instrument Dimensions

H x W x L: 193 mm x 445 mm x 605 mm

Shipping Problems?

If the shipping materials are damaged or the contents of the container are incomplete:

- Contact the nearest Keysight Technologies office.
- Keep the shipping materials for the carrier's inspection.
- If you must return the M9484C VXG to Keysight Technologies, use the original (or comparable) shipping materials. See "Returning an Instrument for Service" on page 140.

Before Applying Power

Verify that all safety precautions are taken. Refer to Chapter 6, "Safety and Maintenance Information", on page 129 for Caution and Warning information. Make all connections to the unit before applying power. Note the external markings described in the Instrument Markings section on page 136.

Power Requirements

100/120 VAC, 50/60/400 Hz, 1350 W Max

220/240 VAC, 50/60 Hz, 2000 W Max

Number of Channels	Maximum Frequency	Power Requirements
1 (Option 001)	6 GHz or 8.5 GHz (opt. 506 or 508)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
	14 GHz or 20 GHz (opt. 514 or 520)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
	31.8 GHz, 44 GHz, or 54 GHz (opt. 532, 544, or 554)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
2 (Option 001 and 002)	6 GHz or 8.5 GHz (opt. 506 or 508)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
	14 GHz or 20 GHz (opt. 514 or 520)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
	31.8 GHz, 44 GHz, or 54 GHz (opt. 532, 544, or 554)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
4 Option 001, 002,003, and 004)	6 GHz or 8.5 GHz (opt. 506 or 508)	100/120 VAC, 50/60/400 Hz, 1350 W Max, 220/240 VAC 50/60 Hz, 2000W Max.
	14 GHz or 20 GHz (opt. 514 or 520)	200/220/240 VAC, 50/60 Hz, 2000W Max.

Environmental Conditions (Operating)

For indoor use only.

Environmental Condition	Requirement
Temperature Range	0 to 50 °C
Maximum Relative Humidity	Maximum Relative Humidity (non-condescending): 95% RH up to 40 °C, decreases linearity to 57% RH at 50°C. From 40°C to 50°C, the maximum % Relative Humidity follows the line of constant dew point.
Altitude (m)	3000 m

Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the environmental stresses of Storage, Transportation and End-use; those stresses include but are not limited to temperature, humidity, shock, vibration, altitude and power line conditions. Test Methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F Class 3.

Instrument Cooling

The following are the recommended best practices to ensure proper and safe operating conditions:

- The primary consideration in using the chassis on a bench is ensuring adequate ventilation for cooling. Ensure that there is at least 50 mm (2 inches) of clearance on the sides, front, and rear of the chassis.
- For bench use, ensure that nothing is stacked on top of the instrument, unless you use the M9484C Advanced Cooling Spacer kit. Ensure adequate clearance is provided around all instrument vents, both air intake vents, and air exhaust vents.
- Ensure that the fan grills are unobstructed.
- To the extent possible, install the instrument in a location with lower ambient temperatures. For example, avoid the situation where the exhaust air from another instrument feeds into the air intake for this instrument.

The M9484C VXG has multiple air intakes. They are located at the lower sides, lower front and bottom of the instrument.

Prepare the Hardware

CAUTION

The following procedures should be followed to ensure safety and to minimize the possibility of damaging electrical components .

- This product is designed for use in Installation Category II and Pollution Degree 2, per IEC 61010 Third Edition and 664 respectively.
- This chassis is designed for indoor use only.
- Mains wiring and connectors shall be compatible with the connector used in the premise electrical system. Failure to ensure adequate earth grounding by not using correct components may cause product damage and serious injury.
- Use only the power cord supplied with the chassis. Keysight power cords ensure continuity between the chassis grounding-type power plug and the safety ground terminal at the power outlet.
- Install the chassis so that the detachable power cord is readily identifiable and is easily reached by the operator. The detachable power cord is the chassis disconnecting device. It disconnects the mains circuits from the mains supply to the chassis before other parts of the chassis. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

Redundant Ground for 100/120V 400 Hz and 220/240V 60 Hz Operation

WARNING

At 100/120V 400 Hz and 220/240V 60 Hz AC input operation, the leakage current of the unit exceeds 3.5 mA. This requires the installation of a permanent, redundant ground from the instrument chassis to earth ground. This ensures that ground will always be connected and that any leakage current will be diverted to ground.

Installing a Redundant Ground

Operation at 100/120V 400 Hz and 220/240V 60 Hz requires the installation of a redundant ground from the instrument chassis to earth ground. The redundant ground must be permanently attached to the unit as well as to the earth ground point.

The following procedure describes how to make the permanent connection to the earth ground screw of the unit. The user must ensure the integrity and permanence of the connection at the earth ground point.

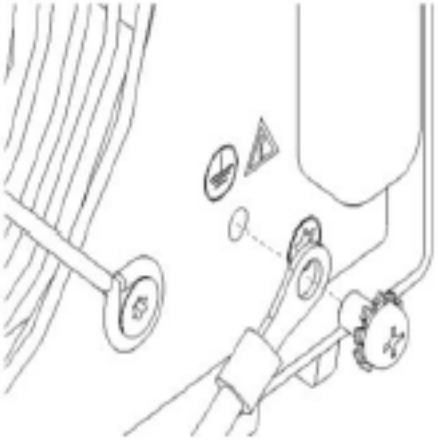
The following customer supplied hardware is required:

– Ground wire (18 AWG)
– Uninsulated ring terminal for attaching the wire to the unit
– Hardware for attaching the wire to the earth ground point
– Phillips cross head screwdriver

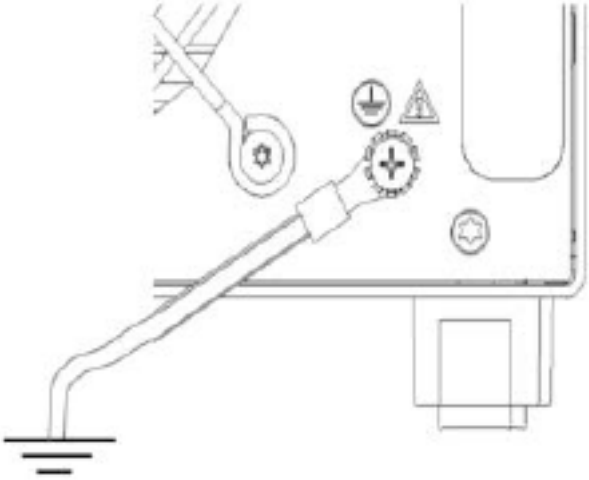
NOTE

The instrument can operate with mains supply voltage fluctuations up to ± 10% of the nominal voltage.

1. Using the screwdriver, remove the screw as shown below.



2. Attach the ground wire with the ring terminal into the screw thread and tighten back to an original ground point.



Prepare and Power Up the Instrument

1. Make sure that the line cord is plugged into a grounded outlet to establish earth ground.
2. Press the power button to power up the instrument.

3. Allow the VXG to warm up for at least 30 minutes before using.

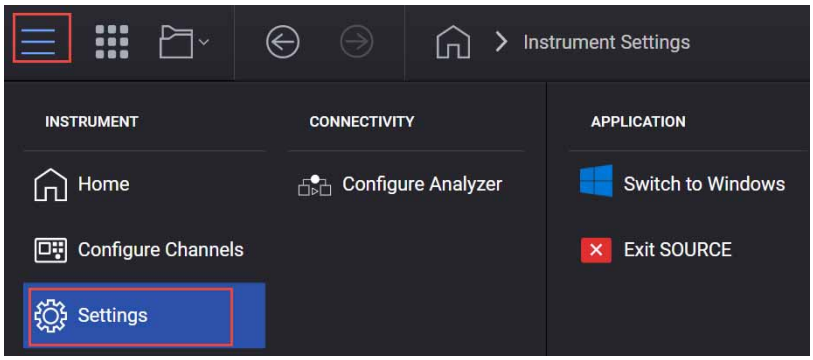
Verify Operation of the Signal Generator

To verify the operation of the M9484C VXG, run a Self Test and Internal Alignments.

Run a Self Test

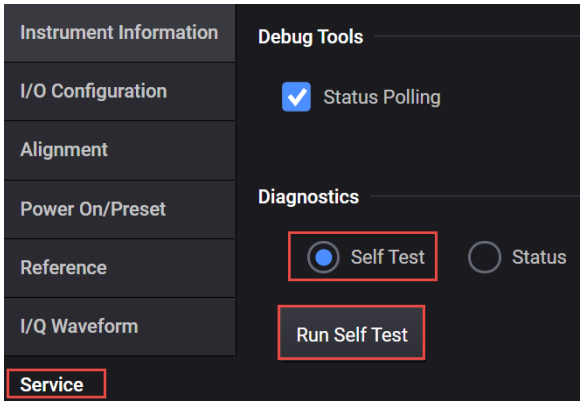
Refer to the "Front and Rear Panel Features" on page 25 for a description of the front and rear panel connectors.

1. From the M9484C application, select the Triple-bar icon (top left corner) and then select **Settings**.

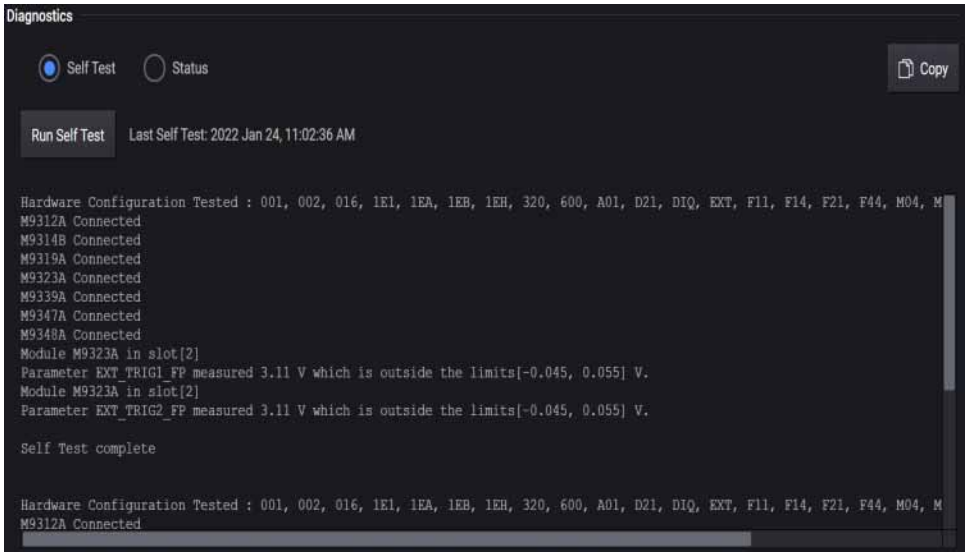


2. Select the **Service** tab > **Self Test** > **Run Self Test**.

   The self test takes 5 to 10 minutes to complete.



If the Self Test passes (see results below), continue on with "Run Alignments" and "Generate and View an Output Signal".



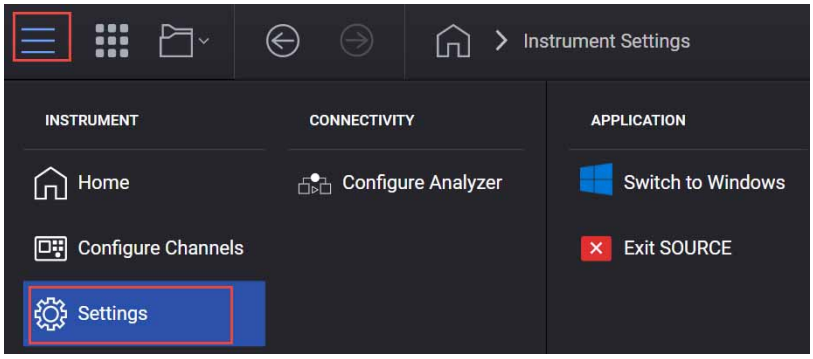
If the Self Test fails, run Alignments (below), then the Self Test again. If it continues to fail, contact Keysight at

https://www.keysight.com/find/assist

for help resolving your issue.

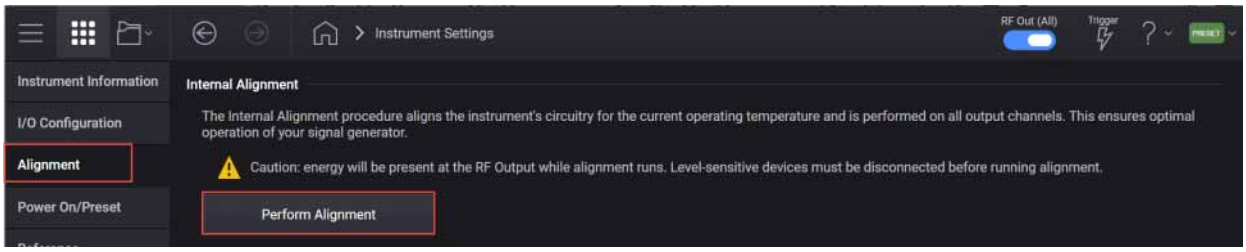
Run Alignments

1. From the M9484C application, select the Triple-bar icon (top left corner) and then select **Settings**.



2. Select the **Alignment** tab > **Perform Alignment**.

   The internal alignments calibration will ensure optimal operation of the VXG. It takes approximately 4 minutes per channel for an 8 GHz unit to complete (higher frequency instruments will take longer).


Instrument Settings
RF Out (All)
Trigger
Instrument Information
I/O Configuration
Alignment
Power On/Preset
Internal Alignment
The Internal Alignment procedure aligns the instrument's circuitry for the current operating temperature and is performed on all output channels. This ensures optimal operation of your signal generator.
Caution: energy will be present at the RF Output while alignment runs. Level-sensitive devices must be disconnected before running alignment.
Perform Alignment

Generate and View an Output Signal

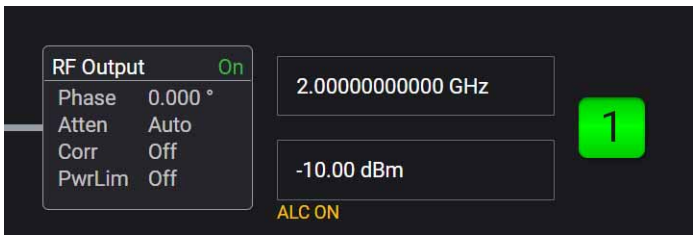
After verifying the operation of the M9484C VXG, you are ready to make a measurement.

NOTE The following measurement uses a M9484C VXG to generate the 2 GHz signal and Keysight Signal Analyzer to analyze it. You may use any frequency depending upon the signal analyzer used.

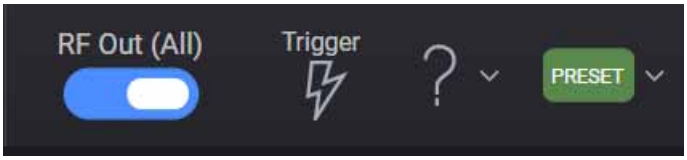
1. Turn on the Keysight signal analyzer.
2. Connect a cable between the M9484C front panel RF Out connector and the RF In connector on the Keysight signal analyzer.

NOTE For an accurate frequency measurement, connect a 10 MHz Ref cable between the M9484C and the signal analyzer.

3. On the M9484C VXG, set the following parameters:
   a. **Frequency**: 2 GHz
   b. **Power**: -10 dBm
   c. Select the channel **1** button to turn on channel 1.

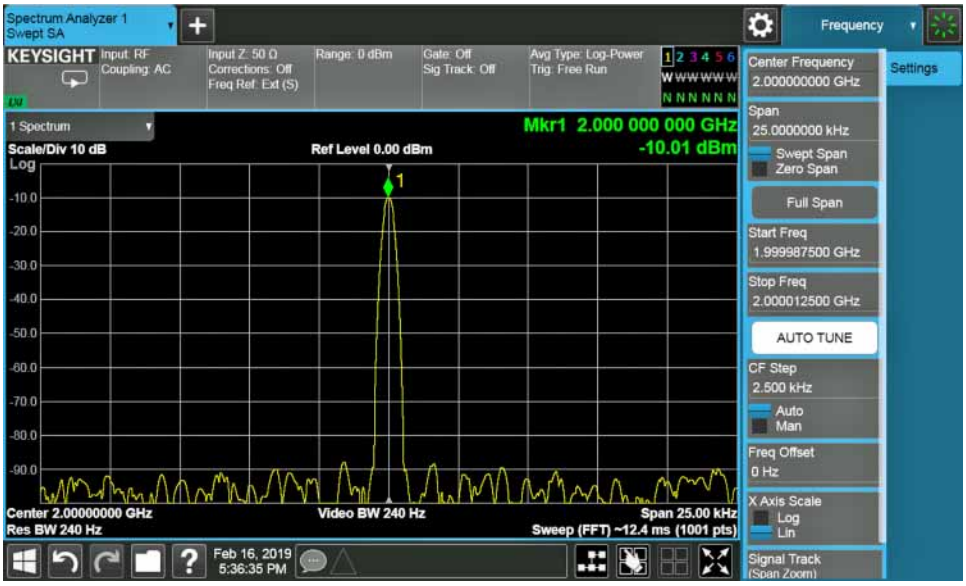


   d. For two and four channel instruments only: In the top right corner of the display, set **RF Out (All)** to **On** by selecting the switch.



4. On the Keysight signal analyzer, select **Frequency** in the menu panel, then **AUTO TUNE**. Verify that you have a 2 GHz, -10 dBm signal as shown below.

NOTE For an accurate frequency measurement, connect a 10 MHz Ref cable between the M9484C and the signal analyzer.



NOTE Repeat the above steps for a M9484C VXG with dual channel configuration, for Channel 2.

NOTE If your shipment includes a Y1265A spare Solid State Drive, continue with "Putting the Additional SSD Into Service" on page 123

NOTE Open the link and click on Technical Support to access the Measurement guide on making basic and 5G NR measurements.
https://www.keysight.com/us/en/product/M9484C/m9484c.html

Shutting Down the Instrument

Power down the instrument using the front panel power button. Press briefly to shut down, press and hold to force a shutdown. Do not power down by removing the power cord. For software controlled shutdown, refer to the **SYSTem:PDOWn** SCPI commands.

Related Documentation

The table below provides the list of documentation available for the M9484C VXG.

Documentation is updated periodically. For the latest documentation, go to the following URL and select Technical Support:

https://www.keysight.com/us/en/product/M9484C/m9484c.html

Document	Description	Format
Startup Guide (this document)	Includes procedures to help you to unpack, inspect, install (software and hardware), perform instrument connections, verify operability, and troubleshoot your product. Also includes an annotated block diagram.	PDF
Embedded Help	Provides user-interface descriptions, programming information, tutorials, SCPI commands and more.	HTML5
Data Sheet	Provides key features and specifications.	PDF
Configuration Guide	Includes standard configurations, options, accessories, and compatible peripherals.	PDF
Measurement Guide	Includes step-by-step procedures to configure the M9484C VXG and perform measurements using the instrument. Also, includes programming examples to help you get started with using SCPI in your application development environment.	PDF

2 Front and Rear Panel Features

This section describes the following features:

"Front Panel Features" on page 26

- "One Channel, 6 GHz or 8.5 GHz" on page 26
- "One Channel, 6.0 GHz or 8.5 GHz, with Analog I/O" on page 29
- "One Channel, 14 GHz or 20 GHz" on page 33
- "One Channel, 14 GHz or 20 GHz, with Analog I/O" on page 36
- "One Channel, 31.8 GHz, 44 GHz, or 54 GHz" on page 40
- "One Channel, 31.8 GHz, 44 GHz, or 54 GHz, with Analog I/O" on page 43
- "Two Channel, 6 GHz or 8.5 GHz" on page 47
- "Two Channel, 6.0 GHz or 8.5 GHz with Analog I/O" on page 50
- "Two Channel, 14 GHz or 20 GHz" on page 54
- "Two Channel, 14 GHz or 20 GHz, with Analog I/O" on page 57
- "Two Channel, 31.8 GHz, 44 GHz, or 54 GHz" on page 62
- "Two Channel, 31.8 GHz, 44 GHz, or 54 GHz with Analog I/O" on page 65
- "Four Channel, 6 GHz or 8.5 GHz" on page 70
- "Four Channel, 14 GHz or 20 GHz" on page 73

"Rear-Panel Features" on page 76

- "Option 001 or Option 001 + 002 (1 or 2 Channels)" on page 76
- "Options 001 + 002 + 003 + 004 (4 Channels)" on page 79

Front Panel Features

One Channel Instruments

One Channel, 6 GHz or 8.5 GHz

For M9484C Option 001and Option 506 or 508 only

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is 0-3 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
4	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the top left 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. The top right 19.2 GHz Out connector is switchable and off by default. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
6	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. The two bottom 19.2 GHz Out connectors have a factory installed 50 Ω termination. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	On/Off Switch	Push Button	Power Switch
8	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
9	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2. Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
10	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3. Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
11	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
12	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
13	RF Out	Type N female	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm Max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

One Channel, 6.0 GHz or 8.5 GHz, with Analog I/O

For M9484C Option 001, Option 506 or 508, and Option AN1

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	Aux I/O	Micro HDMI Type D	Auxiliary Input/Output port (Note: This is not intended for an external monitor) 12 bit single-ended IOs 50 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V Output – Max voltage applied at any output in high-Z state is 5.5 V, 3.8 V when high or low state – 50 Ω output resistance As a Receiver: – 3.3 V output – 5 V tolerant input (damage at 5.5 V) – 10 k Ω input termination

Item		Connector Type	Description
#	Name		
4	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is 0-3 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. The top right 19.2 GHz Out connector is switchable and off by default. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	On/Off Switch	Push Button	Power Switch
9	Trig A, B, or C	SMB	General Purpose Trigger/Marker Ports 100 MHz maximum frequency (drive or receive) As a driver: – 3.3 V output – Max voltage applied at any output in high-Z state is 5.5 V and 3.8 V when in high or low state – 50 Ω output resistance As a receiver: – 5 V input – 5 V tolerant input (damage at 5.5 V) – Selectable input termination (50 Ω or 10 K Ω) – Receiver threshold resolution (5 mV)

Item		Connector Type	Description
#	Name		
10	Ext 1 or 2	SMB	External Inputs 1 and 2 – 16 bit ADC – Selectable input impedance: 50 Ω, 600 Ω, or 1 M Ω – Input Bandwidth: 10 MHz – Input Range: ±1 V (±5 V tolerant)
11	LF Out	SMB	Low Frequency Output – 16 bit DAC – Output impedance: 50 Ω – Output range into 50 Ω: ±5 V (DC to 5 MHz), ±2.5 V (5 MHz to 10 MHz) – Output range into 1 M Ω: ±6.5 V (DC to 5 MHz), ±4.5 V (5 MHz to 10 MHz) – Bandwidth: 10 MHz (sine wave); 2 MHz (square and triangle waves)
12	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
13	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
14	I+ Out	SMA	Analog In-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
15	I- Out	SMA	Analog in-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V

Item		Connector Type	Description
#	Name		
16	Q+ Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
17	Q- Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
18	RF Out	Type N Female	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm Max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

One Channel, 14 GHz or 20 GHz

For M9484C Option 001and Option 514 or 520

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 10-13 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
4	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is 0-3 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
6	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	2.4 GHz Out	SMA[a]	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	On/Off Switch	Push Button	Power Switch
10	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
11	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

Item		Connector Type	Description
#	Name		
12	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
13	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
14	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
15	RF Out	APC 3.5 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm Max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

One Channel, 14 GHz or 20 GHz, with Analog I/O

For M9484C Option 001, Option 514 or 520, and Option AN1

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	Aux I/O	Micro HDMI Type D	Auxiliary Input/Output port (Note: This is not intended for an external monitor) 12 bit single-ended IOs 50 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V Output – Max voltage applied at any output in high-Z state is 5.5 V, 3.8 V when high or low state – 50 Ω output resistance As a Receiver: – 3.3 V output – 5 V tolerant input (damage at 5.5 V) – 10 k Ω input termination

Item		Connector Type	Description
#	Name		
4	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 10-13 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
5	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is 0-3 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
10	On/Off Switch	Push Button	Power Switch

Item		Connector Type	Description
#	Name		
11	Trig A, B or C	SMB	General Purpose Trigger/Marker Ports 100 MHz maximum frequency (drive or receive) As a driver: – 3.3 V output – Max voltage applied at any output in high-Z state is 5.5 V and 3.8 V when in high or low state – 50 Ω output resistance As a receiver: – 5 V input – 5 V tolerant input (damage at 5.5 V) – Selectable input termination (50 Ω or 10 K Ω) – Receiver threshold resolution (5 mV)
12	Ext 1 or 2	SMB	External Inputs 1 and 2 – 16 bit ADC – Selectable input impedance: 50 Ω, 600 Ω, or 1 M Ω – Input Bandwidth: 10 MHz – Input Range: ±1 V (±5 V tolerant)
13	LF Out	SMB	Low Frequency Output – 16 bit DAC – Output impedance: 50 Ω – Output range into 50 Ω: ±5 V (DC to 5 MHz), ±2.5 V (5 MHz to 10 MHz) – Output range into 1 M Ω: ±6.5 V (DC to 5 MHz), ±4.5 V (5 MHz to 10 MHz) – Bandwidth: 10 MHz (sine wave); 2 MHz (square and triangle waves)
14	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
15	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
16	I+ Out	SMA	Analog In-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
17	I- Out	SMA	Analog in-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
18	Q+ Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
19	Q- Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
20	RF Out	APC 3.5 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

One Channel, 31.8 GHz, 44 GHz, or 54 GHz

For M9484C Option 001 and Option 532 or 540 or 554

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	USB 3.0 Type C. Provides power and digital control to the V3080A Vector Signal Generator Frequency Extender. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
4	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.

Item		Connector Type	Description
#	Name		
6	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	On/Off Switch	Push Button	Power Switch
10	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
11	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

Item		Connector Type	Description
#	Name		
12	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
13	LO1 and LO2	APC 3.5 mm	9.6 GHz signal
14	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
15	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
16	RF Out	1.85 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +24 dBm maximum reverse power, 0 VDC Max

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

One Channel, 31.8 GHz, 44 GHz, or 54 GHz, with Analog I/O

For M9484C Option 001, Option 532 or 540 or 554, and Option AN1

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	USB 3.0 Type C. Provides power and digital control to the V3080A Vector Signal Generator Frequency Extender. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	Aux I/O		Auxiliary Input/Output port (Note: This is not intended for an external monitor) 12 bit single-ended IOs 50 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V Output – Max voltage applied at any output in high-Z state is 5.5 V, 3.8 V when high or low state – 50 Ω output resistance As a Receiver: – 3.3 V output – 5 V tolerant input (damage at 5.5 V) – 10 k Ω input termination

Item		Connector Type	Description
#	Name		
4	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
7	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
10	On/Off Switch	Push Button	Power Switch

Item		Connector Type	Description
#	Name		
11	Trig A, B or C	SMB	General Purpose Trigger/Marker Ports 100 MHz maximum frequency (drive or receive) As a driver: – 3.3 V output – Max voltage applied at any output in high-Z state is 5.5 V and 3.8 V when in high or low state – 50 Ω output resistance As a receiver: – 5 V input – 5 V tolerant input (damage at 5.5 V) – Selectable input termination (50 Ω or 10 K Ω) – Receiver threshold resolution (5 mV)
12	Ext 1 or 2	SMB	External Inputs 1 and 2 – 16 bit ADC – Selectable input impedance: 50 Ω, 600 Ω, or 1 M Ω – Input Bandwidth: 10 MHz – Input Range: ±1 V (±5 V tolerant)
13	LF Out	SMB	Low Frequency Output – 16 bit DAC – Output impedance: 50 Ω – Output range into 50 Ω: ±5 V (DC to 5 MHz), ±2.5 V (5 MHz to 10 MHz) – Output range into 1 M Ω: ±6.5 V (DC to 5 MHz), ±4.5 V (5 MHz to 10 MHz) – Bandwidth: 10 MHz (sine wave); 2 MHz (square and triangle waves)
14	LO 1 and LO 2	APC 3.5 mm	9.6 GHz signal
15	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
16	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
17	I+ Out	SMA	Analog In-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
18	I- Out	SMA	Analog in-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
19	Q+ Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
20	Q- Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
21	RF Out	1.85 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +24 dBm maximum reverse power, 0 VDC Max

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Two Channel Instruments

Two Channel, 6 GHz or 8.5 GHz

For M9484C Option 001 + 002 and 506 or 508

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is 0-3 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
4	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
5	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. These two 19.2 GHz Out connectors have a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	On/Off Switch	Push Button	Power Switch
7	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
8	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
9	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
10	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
11	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
12	RF Out	Type N female	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Two Channel, 6.0 GHz or 8.5 GHz with Analog I/O

For M9484C Option 001 + 002, Option 506 or 508, and Option AN1

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	Aux I/O	Micro HDMI Type D	Auxiliary Input/Output port (Note: This is not intended for an external monitor) 12 bit single-ended IOs 50 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V Output – Max voltage applied at any output in high-Z state is 5.5 V, 3.8 V when high or low state – 50 Ω output resistance As a Receiver: – 3.3 V output – 5 V tolerant input (damage at 5.5 V) – 10 k Ω input termination

Item		Connector Type	Description
#	Name		
4	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is 0-3 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	On/Off Switch	Push Button	Power Switch
8	Trig A, B, or C	SMB	General Purpose Trigger/Marker Ports 100 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V output – Max voltage applied at any output in high-Z state is 5.5 V and 3.8 V when in high or low state – 50 Ω output resistance As a Receiver: – 5 V input – 5 V tolerant input (damage at 5.5 V) – Selectable input termination (50 Ω or 10 K Ω) – Receiver threshold resolution (5 mV)
9	Ext 1 or 2	SMB	External Inputs 1 and 2 – 16 bit ADC – Selectable input impedance: 50 Ω, 600 Ω, or 1 M Ω) – Input Bandwidth: 10 MHz – Input Range: ±1 V (±5 V tolerant)

Item		Connector Type	Description
#	Name		
10	LF Out	SMB	Low Frequency Output – 16 bit DAC – Output impedance: 50 Ω – Output range into 50 Ω: ±5 V (DC to 5 MHz), ±2.5 V (5 MHz to 10 MHz) – Output range into 1 M Ω: ±6.5 V (DC to 5 MHz), ±4.5 V (5 MHz to 10 MHz) – Bandwidth: 10 MHz (sine wave); 2 MHz (square and triangle waves)
11	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
12	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
13	I+ Out	SMA	Analog In-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
14	I- Out	SMA	Analog in-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
15	Q+ Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V

Item		Connector Type	Description
#	Name		
16	Q- Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
17	CH 1 and CH 2 RF Out	Type N Female	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm, 0 VDC maximum
18	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
19	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
20	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Two Channel, 14 GHz or 20 GHz

For M9484C Option 001 + 002 and 514 or 520

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
4	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.

Item		Connector Type	Description
#	Name		
6	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
7	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	On/Off Switch	Push Button	Power Switch
10	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
11	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

Item		Connector Type	Description
#	Name		
12	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
13	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
14	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
15	RF Out	APC 3.5 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Two Channel, 14 GHz or 20 GHz, with Analog I/O

For M9484C Option 001 + 002, 514 or 520, and AN1

Item		Connector Type	Description
#	Name		
1	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
2	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
3	Aux I/O	Micro HDMI Type D	Auxiliary Input/Output port (Note: This is not intended for an external monitor) 12 bit single-ended IOs 50 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V Output – Max voltage applied at any output in high-Z state is 5.5 V, 3.8 V when high or low state – 50 Ω output resistance As a Receiver: – 3.3 V output – 5 V tolerant input (damage at 5.5 V) – 10 k Ω input termination

Item		Connector Type	Description
#	Name		
4	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
5	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
7	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
10	On/Off Switch	Push Button	Power Switch

Item		Connector Type	Description
#	Name		
11	Trig A, B, or C	SMB	General Purpose Trigger/Marker Ports 100 MHz maximum frequency (drive or receive) As a driver: – 3.3 V output – Max voltage applied at any output in high-Z state is 5.5 V and 3.8 V when in high or low state – 50 Ω output resistance As a receiver: – 5 V input – 5 V tolerant input (damage at 5.5 V) – Selectable input termination (50 Ω or 10 K Ω) – Receiver threshold resolution (5 mV)
12	Ext 1 or 2	SMB	External Inputs 1 and 2 – 16 bit ADC – Selectable input impedance: 50 Ω, 600 Ω, or 1 M Ω – Input Bandwidth: 10 MHz – Input Range: ±1 V (±5 V tolerant)
13	LF Out	SMB	Low Frequency Output – 16 bit DAC – Output impedance: 50 Ω – Output range into 50 Ω: ±5 V (DC to 5 MHz), ±2.5 V (5 MHz to 10 MHz) – Output range into 1 M Ω: ±6.5 V (DC to 5 MHz), ±4.5 V (5 MHz to 10 MHz) – Bandwidth: 10 MHz (sine wave); 2 MHz (square and triangle waves)
14	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
15	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
16	I+ Out	SMA	Analog In-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
17	I– Out	SMA	Analog in-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
18	Q+ Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
19	Q– Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
20	CH 1 or CH 2 RF Out	APC 3.5 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm max reverse power, 0 VDC maximum
21	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.

Item		Connector Type	Description
#	Name		
22	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
23	Rx FC/Trig 3	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Two Channel, 31.8 GHz, 44 GHz, or 54 GHz

For M9484C Option 001 + 002, Option 532 or 544 or 554

Item		Connector Type	Description
#	Name		
1	System Sync Up		Reserved for future use
2	System Sync Down		Reserved for future use
3	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
4	USB-C PD	USB Type-C female	USB 3.0 Type C. Provides power and digital control to the V3080A Vector Signal Generator Frequency Extender. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
5	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
7	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
8	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
10	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
11	On/Off Switch	Push Button	Power Switch
12	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
13	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

Item		Connector Type	Description
#	Name		
14	Tx FC/Trig 3	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 M Ω impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
15	LO 1 and LO 2	APC 3.5 mm	9.6 GHz signal
16	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
17	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
18	CH 1 and CH2 RF Out	1.85 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +24 dBm maximum reverse power, 0 VDC

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Two Channel, 31.8 GHz, 44 GHz, or 54 GHz with Analog I/O

For M9484C Option 001 + 002, Option 532 or 544 or 554, and Option AN1

Item		Connector Type	Description
#	Name		
1	System Sync Up		Reserved for future use
2	System Sync Down		Reserved for future use
3	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
4	USB-C PD	USB Type-C female	USB 3.0 Type C. Provides power and digital control to the V3080A Vector Signal Generator Frequency Extender. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.

Item		Connector Type	Description
#	Name		
5	Aux I/O	Micro HDMI Type D	Auxiliary Input/Output port (Note: This is not intended for an external monitor) 12 bit single-ended IOs 50 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V Output – Max voltage applied at any output in high-Z state is 5.5 V, 3.8 V when high or low state – 50 Ω output resistance As a Receiver: – 3.3 V output – 5 V tolerant input (damage at 5.5 V) – 10 k Ω input termination
6	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. Damage can occur if the power level exceeds the maximum value in this range.
7	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
9	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
10	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power levels range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
11	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
12	On/Off Switch	Push Button	Power Switch
13	Trig A, B, or C	SMB	General Purpose Trigger/Marker Ports 100 MHz maximum frequency (drive or receive) As a Driver: – 3.3 V output – Max voltage applied at any output in high-Z state is 5.5 V and 3.8 V when in high or low state – 50 Ω output resistance As a Receiver: – 5 V input – 5 V tolerant input (damage at 5.5 V) – Selectable input termination (50 Ω or 10 K Ω) – Receiver threshold resolution (5 mV)
14	Ext 1 or 2	SMB	External Inputs 1 and 2 – 16 bit ADC – Selectable input impedance: 50 Ω, 600 Ω, or 1 M Ω – Input Bandwidth: 10 MHz – Input Range: ±1 V (±5 V tolerant)

Item		Connector Type	Description
#	Name		
15	LF Out	SMB	Low Frequency Output – 16 bit DAC – Output impedance: 50 Ω – Output range into 50 Ω: ±5 V (DC to 5 MHz), ±2.5 V (5 MHz to 10 MHz) – Output range into 1 M Ω: ±6.5 V (DC to 5 MHz), ±4.5 V (5 MHz to 10 MHz) – Bandwidth: 10 MHz (sine wave); 2 MHz (square and triangle waves)
16	LO 1 and LO 2	APC 3.5 mm	9.6 GHz signal
17	Event 2	BNC	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
18	Event 3	BNC	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
19	I+ Out	SMA	Analog In-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
20	I– Out	SMA	Analog in-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
21	Q+ Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V

Item		Connector Type	Description
#	Name		
22	Q– Out	SMA	Analog quadrature-phase component of I/Q modulation from channel 1's internal baseband generator. Frequency range is DC to 1000 MHz (nominal) 50 Ω impedance (nominal) Damage Level is ±2 V
23	CH 1 and CH 2 RF Out	1.85 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +24 dBm maximum reverse power, 0 VDC
24	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
25	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
26	Tx FC/Trig 3	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Four Channel Instruments

Four Channel, 6 GHz or 8.5 GHz

For M9484C Option 001 + 002 + 003 + 004 and Option 506 or 508

Item		Connector Type	Description
#	Name		
1	System Sync Up		Reserved for future use
2	System Sync Down		Reserved for future use
3	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
4	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
5	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
6	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
7	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
8	On/Off Switch	Push Button	Power Switch
9	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
10	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.
11	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
12	Event 1	BNC	Baseband Marker Output #1 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
13	Event 2	SMB	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
14	Event 3	SMB	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
15	RF Out	Type N Female	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Four Channel, 14 GHz or 20 GHz

For M9484C Option 001 + 002 + 003 + 004 and Option 514 or 520

Item		Connector Type	Description
#	Name		
1	System Sync Up		Reserved for future use
2	System Sync Down		Reserved for future use
3	SS - USB 3.0	USB Type-A female	Host controller, SuperSpeed, 900 mA (nominal)
4	USB-C PD	USB Type-C female	Reserved for future use. The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.
5	2.4 GHz In[a]	SMA	2.4 GHz input 50 Ω impedance The power level range is 11-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
6	2.4 GHz Out[a]	SMA	Output of 2.4 GHz frequency reference. A factory installed cable connects the 2.4 GHz Out connector to the 2.4 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 15-17 dBm. This range is nominal to minimize distortion and get the best signal fidelity.

Item		Connector Type	Description
#	Name		
7	19.2 GHz In[a]	SMA	19.2 GHz input 50 Ω impedance The power level range is -2 to 7 dBm (MAX). Hardware damage can occur if the power level exceeds the maximum value in this input range.
8	19.2 GHz Out[a]	SMA	Output of 19.2 GHz frequency reference. A factory installed cable connects the 19.2 GHz Out connector to the 19.2 GHz In. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is -1 to 2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
9	2.4 GHz Out	SMA	Output of 2.4 GHz frequency reference. This 2.4 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 11-13 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
10	19.2 GHz Out	SMA	Output of 19.2 GHz frequency reference. This 19.2 GHz Out connector has a factory installed 50 Ω termination. This port is always on. If unused, this port should be terminated with 50 Ω load. The power level range is 0-2 dBm. This range is nominal to minimize distortion and get the best signal fidelity.
11	On/Off Switch	Push Button	Power Switch
12	Tx FC/Trig 2	SMB	Dual function connector: ODI transmit flow control or trigger input/output 2 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
13	ODI	ODI	Optical Digital Interface. Optical interconnect for very high speed streaming applications between instruments, processors, and storage.

Item		Connector Type	Description
#	Name		
14	Rx FC/Trig 3	SMB	Dual function connector: ODI receive flow control or trigger input/output 3 Input: 1.8 V LVCMOS 1 MΩ impedance Output: 1.8 V LVCMOS 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 5.5 V
15	Event 1	BNC	Baseband Marker Output #1 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
16	Event 2	SMB	Baseband Marker Output #2 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
17	Event 3	SMB	Baseband Marker Output #3 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
18	RF Out	APC 3.5 mm	RF Output signal, level selected by user interface. 50 Ω impedance (nominal) +30 dBm max reverse power, 0 VDC maximum

a. The 2.4 GHz and 19.2 GHz input and output ports are designed for phase coherent operation between one or more M9484C VXG signal generators. Keysight Technologies recommends that you do not connect an external 2.4 GHz or 19.2 GHz signal to the M9484C VXG 2.4 GHz or 19.2 GHz inputs as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Rear-Panel Features

Option 001 or Option 001 + 002 (1 or 2 Channels)

Item		Connector Type	Description
#	Name		
1	Line	3-prong plug	AC power receptacle, accepts 3-pronged AC power cord supplied with the instrument.
2	GPIB	Micro-D-25-pin	IEEE-488.2, 1987 with listen and talk Use accessory: Y1260A for GPIB cabling
3	LAN	RJ-45	GbE 10/100/1000BASE-T Ethernet: the LAN supports DHCP, connection monitoring, dynamic hostname services, TCP/IP communication, TCP keep alive, and SCPI remote programming
4	Ch1 Trig 1	BNC	Channel 1 Trigger 1 input/output: 1 MΩ input impedance Threshold is adjustable from 0 V to 3.3 V Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
5	Ch1 Event 1	BNC	Channel 1 Baseband Waveform Marker Output #1 Maximum Edge Rate: every 1.667 ns VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V

Item		Connector Type	Description
#	Name		
6	Ch2 Trig 1	BNC	Channel 2 Trigger 1 input/output: (not used for a single channel instrument) 1 MΩ impedance Threshold is adjustable from 0 V to 3.3 V Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
7	Ch2 Event 1	BNC	Channel 2 Baseband Waveform Marker Output #2 Maximum Edge Rate: every 1.667 ns (not used for a single channel instrument) VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
8	10 MHz Out	BNC	Output of 10 MHz frequency reference, this port is always on +15 dBm (nominal) 50 Ω impedance (nominal) ESD damage level is 30 V
9	Ref In	BNC	Externally supplied 1 MHz to 110 MHz frequency reference, switched by the user interface; off by default. Input level -3 dBm to +20 dBm (nominal), 50 Ω impedance.
10	100 MHz Out[a]	SMA	Output of 100 MHz reference signal is to be connected to SClk In. This port is always on and its output level is +15 dBm (nominal). If alternate SCLK In is provided this port should be terminated with 50 Ω load. Ports 10 and 11 are connected by a factory installed cable.
11	SClk In[a]	SMA	Synchronization clock input. Refer to "Basic Sync Cabling Setup for Multi-Instrument" topic in the M9484C Online Help. 50 Ω impedance. +2 dBm to +12 dBm
12	SClk Out	SMA	Synchronization clock output. Refer to "Basic Sync Cabling Setup for Multi-Instrument" topic in the M9484C Online Help. 50 Ω impedance. +2 dBm nominal

Item		Connector Type	Description
#	Name		
13	STrig Out	SMA	Synchronization trigger input/output. To be connected to downstream STrig In for synchronization. Input: Threshold is adjustable from 0 V to 3.3 V 1 MΩ impedance Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
14	STrig In	SMA	Synchronization trigger input/output. To be connected to upstream STrig Out for synchronization. Input: Threshold is adjustable from 0 V to 3.3 V 1 MΩ impedance Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
15	EFC	SMA	Reserved for future use. ESD damage level is 30 V

a. The SClk In and 100 MHz Out ports are designed for phase coherent operation between one or more M9484C VXG signal generators with Option SNC. The SClk In port should only be used to connect to upstream SClk Out from other VXGs. Keysight Technologies recommends that you do not connect any other signals to the SClk In port as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

Options 001 + 002 + 003 + 004 (4 Channels)

Item		Connector Type	Description
#	Name		
1	Line	3-prong plug	AC power receptacle, accepts 3-pronged AC power cord supplied with the instrument.
2	GPIB	Micro-D-25-pin	IEEE-488.2, 1987 with listen and talk Use accessory: Y1260A for GPIB cabling
3	LAN	RJ-45	GbE 10/100/1000BASE-T Ethernet: the LAN supports DHCP, connection monitoring, dynamic hostname services, TCP/IP communication, TCP keep alive, and SCPI remote programming
4	Ch1 Trig 1, Ch2 Trig 1, Ch3 Trig 1, and Ch4 Trig 1	BNC	Channel 1, 2, 3, or 4 Trigger 1 input/output: 1 MΩ input impedance Threshold is adjustable from 0 V to 3.3 V Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
5	10 MHz Out	BNC	Output of 10 MHz frequency reference, this port is always on +15 dBm (nominal) 50 Ω impedance (nominal) ESD damage level is 30 V
6	Ref In	BNC	Externally supplied 1 MHz to 110 MHz frequency reference, switched by the user interface; off by default. Input level –3 dBm to +20 dBm (nominal), 50 Ω impedance.

Item		Connector Type	Description
#	Name		
7	100 MHz Out[a]	SMA	Output of 100 MHz reference signal is to be connected to SClk In. This port is always on and its output level is +15 dBm (nominal). If alternate SCLK In is provided this port should be terminated with 50 Ω load. Ports 7 and 8 are connected by a factory installed cable.
8	SClk In[a]	SMA	Synchronization clock input. Refer to "Basic Sync Cabling Setup for Multi-Instrument" topic in the M9484C Online Help. 50 Ω impedance. +2 dBm to +12 dBm
9	SClk Out	SMA	Synchronization clock output. Refer to "Basic Sync Cabling Setup for Multi-Instrument" topic in the M9484C Online Help. 50 Ω impedance. +2 dBm nominal
10	STrig Out	SMA	Synchronization trigger input/output. To be connected to downstream STrig In for synchronization. Input: Threshold is adjustable from 0 V to 3.3 V 1 MΩ impedance Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
11	STrig In	SMA	Synchronization trigger input/output. To be connected to upstream STrig Out for synchronization. Input: Threshold is adjustable from 0 V to 3.3 V 1 MΩ impedance Output: VOL < 0.4 V, VOH is 2.8 V to 3.3 V into high impedance 50 Ω impedance (nominal) Damage level is outside of -0.5 V to 3.8 V
12	EFC	SMA	Reserved for future use. ESD damage level is 30 V

a. The SClk In and 100 MHz Out ports are designed for phase coherent operation between one or more M9484C VXG signal generators with Option SNC. The SClk In port should only be used to connect to upstream SClk Out from other VXGs. Keysight Technologies recommends that you do not connect any other signals to the SClk In port as the instrument specifications will not be covered by the warranty.
Jumper removal and connection should be performed when the VXG is powered off.

3 Instrument Operating System

This chapter describes the Microsoft Windows configuration and settings used with the Keysight instrument software. It includes information about changing some of the system settings.

The following topics can be found in this chapter:

"Installed Software " on page 82

"VXG Licensing Options" on page 83

"User Installation of Software" on page 86

"User Accounts and Passwords" on page 87

"Windows Configuration" on page 88

"Configuring LAN" on page 91

"Windows Security" on page 93

"Installing and Using an FTP Server on Windows 10" on page 95

"System Maintenance" on page 101

"USB Connections" on page 102

"Disk Drive Partitioning and Use" on page 103

"Disk Drive Recovery Process" on page 104

Installed Software

Microsoft Windows

Your instrument has Microsoft Windows installed at the factory. Keysight has already configured many of the settings in Microsoft Windows for optimal behavior in your instrument. This chapter contains details about many of these settings.

Instrument Software

The instrument software is factory installed in the M9484C VXG Millimeter Wave Signal Generator. For optional software and capabilities, you may purchase the license at a later date.

Is Your Product Software Up-To-Date?

Periodically, Keysight releases firmware updates to fix known defects and incorporate product enhancements. To search for software updates for your product, visit

https://www.keysight.com/us/en/product/M9484C/m9484c.html

VXG Licensing Options

The VXG has four licensing types that have one of two terms attached. The terms are P (Perpetual) and L (1 year). These licensing types and terms are available on all software options. Fixed Perpetual licenses are also required to enable hardware options.

Fixed Licenses

Fixed licenses are identified by the “F” in the second character and a “P” or an "L" in the third character of the option designator:

Example: N7653APPC-1FP or N7653APPC-1FL

You can only install the license key on the specific instrument for which it was created.

Transportable Licenses

Transportable licenses are a type of license offering deployment that is not fixed to a specific instrument model and serial number. Transportable licenses are identified in the product structure by a “T” in the second character and a “P” or an "L" in the third character of the option designator:

Example: N7621APPC-1TP or N7621APPC-1TL

Transportable licenses require a connection to the Keysight server only for managing the transfer of the license to and from the instrument. The connection to the Keysight server may be via the instrument itself or an external PC. The Keysight licensing server also provides for storage of unused licenses that have been transported off instruments but are awaiting assignment to new instruments. The server will limit the number of transports per 30 day period per application license to 10.

Transportable licenses require redemption and installation of the license before the first transport to a different instrument.

It is recommended that instruments be at the same instrument software release so that the user experience is identical between instruments. This is particularly important when transporting the license for a newly-released application, which may only be available in the latest software release.

Network Licenses

Network licenses are available over the user’s network from a server the user configures. Network licenses are identified in the product structure by an "N" in the second character and either a "P" or an "L" in the third character, indicating a term of either Perpetual or 1 year (12 months), respectively.

Example: N7642APPC-1NP

The server has a count for each license and will only allow instruments to "check-out" a license up to that count. Once the count is reached for a specific license, further check-outs fail until one of the licenses is checked back in to the server. Therefore, it is possible for an instrument to have different features available based on what licenses are available on the server when it tries to get the licenses.

Setting up network licenses is done via the Keysight Floating License Manager. Refer to the Installation Guide that can be downloaded from this web page.

USB Portable Licenses

The USB Portable license is implemented with a physical dongle that is a USB device like a USB thumb drive. It has a Host ID fixed in the dongle hardware. It does not contain any writable data and so is acceptable to high security A/D users. Transporting licenses from one instrument to another just requires moving the dongle and license files to the desired instrument. The license files can be installed on many instruments, but they will only be valid on the one instrument that has the dongle.

USB Portable licenses are identified in the product structure by an "U" in the second character and either a "P" or an "L" in the third character, indicating a term of either Perpetual or 1 year (12 months), respectively.

Example: N7631APPC-1UP

With USB portable licenses, the pre-installed Keysight Floating License Manager is used to add licenses to the instrument's server.

USB Portable licenses with a limited count are checked out and in like Network licenses. Because the licenses are local, there will be no network latency involved in the check-out/check-in, but there can still be a slight performance degradation compared to Fixed and Transportable licenses.

USB Portable licenses that are "uncounted", will perform comparably to the Fixed and Transportable licenses.

Plugging/un-plugging the dongle is equivalent to transporting a license to/from the instrument, however, the application must be restarted whenever the dongle is plugged in.

Configuring Network and USB Licenses

The Keysight Floating License Manager must be used to configure the Network or USB Portable licenses before the licenses can be used. An instrument can be configured for Network or USB Portable licenses or both. To set up USB Portable licenses, in the Keysight Floating License Manager select "Start a floating license server with a license file" and add files containing the USB Portable licenses desired. To set up Network licenses, in the Keysight Floating License Manager select "Connect to a floating license server" and enter the network server's name preceded by the "@" character (example: "@myserver").

To set up both Network and USB Portable license, first configure the USB Portable license, then configure the Network licenses, but append ";@localhost" to the server name (example: "@myserver;@localhost"). Whenever the configuration is changed, the software must be restarted.

User Installation of Software

Installation of Other 3rd Party Software

The M9484C VXG platform is an Open Windows environment, so you can install software on the instrument. However, installation of non-approved software may affect instrument performance. Keysight does not warrant the performance of the instruments with non-approved software installed.

If you install programs other than those that Keysight has tested, it could cause problems with the instrument's applications. If this happens, you should try uninstalling the program that has caused the problem, or try changing the program's configuration. If this does not correct the problem, you may have to use the Instrument Recovery system to reinstall the instrument's system software.

User Accounts and Passwords

The instrument ships with the following user accounts already set up. In addition, you can create your own accounts if you desire. The privileges associated with each account determine what you can and cannot do using that account.

User Name	Default Password	Operations that can be performed using this user account
Administrator	Keysight4u!	- Install software - Configure network and printer access - Access all files on the instrument - Add or change user accounts and passwords - Change Firewall settings - Change Windows settings (e.g., using Device Manager) - Change the time and date - Run any application
Instrument *(member of the Standard Users group)*	measure4u	- Configure network and printer access (although not local printer access) - Access files on the instrument that are accessible to the Users group - Run applications that are accessible to the Users group

NOTE For security reasons, it is recommended that you change the default passwords for these user accounts.

User Creation of Accounts

You can create additional user accounts and decide on the level of security granted to any new user accounts created. For example, the level of security can be assigned as Administrator, power user, standard user, backup operators. User names are not case sensitive but passwords are case sensitive.

It is Keysight's expectation that each user's Documents folder is mapped to the D: drive. This is to avoid overwriting the user's data in the event the Instrument Recovery must be performed. Also, this facilitates convenient backup by copying the contents of the D: drive to external media. All user accounts created by the factory already have Documents mapped to the D: drive. It is recommended to map all new users' Documents folders to the D: drive.

Windows Configuration

The Windows settings have been optimized for the best measurement performance. Any modifications to these settings may degrade instrument performance and measurement speed. In general, most Windows System settings (typically set through the Windows Control Panel) should not be modified. Those that can be safely modified are listed below.

CAUTION **To recover from problems caused by changing Windows Systems settings, you may have to reinstall the Windows system and instrument applications using the Instrument Recovery process.**

Settings That Can Be Changed

You may change the following Windows settings or administrative tasks (available from the Windows Control Panel) to suit your own personal preferences. It is recommended that you document any changes to the instrument's configuration in case an Instrument Recovery is performed and the configuration is reset.

NOTE **Some of these actions can only be performed with Administrator privileges.**

You May Use This Feature:	To Do This...
 Windows Update	Configure Microsoft Windows Automatic Updates. Microsoft recommends that you always get the latest critical Windows updates to ensure that the instrument's Windows operating system is protected. If the instrument has Internet access, the instrument default is set to automatically check for critical Windows Updates and notify you.
 Network and Sharing Center	Add the instrument to a network
 Devices and Printers	Install and configure a printer
 Date and Time	Set the time and date

You May Use This Feature:	To Do This...
 System	If you click on “Advanced System Settings” a dialog will open called “System Properties.” On this dialog there is an “Advanced” tab, which opens up a dialog with a number of settings options. One of these is “Performance”, and if you click on the “Settings” button under “Performance”, you will see another dialog with a number of settings options. The default is “Let Windows choose what’s best for my computer.” You can also select “Adjust for best performance.” You should leave the remaining selections unchanged.

Settings That Must Not Be Changed

Avoid changing the settings described below (available from the Windows Control Panel). Changes to these settings may degrade instrument performance, screen displays, and measurement speed.

Do NOT Use This Feature:	To Do This...
 Power Options	Do not change Power Options.
 System	If you click on “Advanced System Settings” a dialog will open called “System Properties.” On this dialog there is a tab called “Hardware.” You should not modify any settings under the “Hardware” tab. On this dialog there is also a tab called “Advanced.” You should not modify any settings under the “Advanced” tab except as described above under “Settings that can be changed”.
 Fonts	Do not remove installed Fonts
 Display	Do not change the following Display Settings: –Screen Saver settings (under “Personalization) –Screen resolution (under “Adjust Resolution”) –DPI setting (under “Set custom text size”)
 Region and Language	**CAUTION** **Do not change any settings under “Region and Language” or the instrument keyboard and display may not operate properly.**
 User Accounts	Do not delete or modify the "KeysightOnly" user account.

In addition, do not:

- Add, delete, or modify disk drive partitions.
- Delete or modify Keysight registry entries.
- Change the contents of any directories containing the name "Keysight".
- Stop the IIS server
- Tamper with any virtual directories (or their contents) that came configured with the instrument.
- Uninstall these libraries, interfaces, or programs:
  - The I/O Libraries
  - The .NET Framework or any Hotfixes or Service Packs for the .NET Framework
  - The “Microsoft Visual J# .NET Redistributable Package 1.1”
  - Programs that begin with "Keysight"
  - The Adobe Acrobat reader
- Modify:
  - The I/O Library “GPIB27”, “GPIB28” interfaces shown as configured Instrument I/O in the Connection Expert or I/O Config

Autoplay/Autorun

Since the introduction of Windows XP, the term Autoplay (sometimes also called Autorun) has come to be associated with the feature which assists users in selecting appropriate actions when new media and devices are detected. The Autoplay/Autorun feature is turned off in the instrument, by default, for heightened security, unless the Administrator account is running.

If you wish to re-enable Autoplay/Autorun, you may use the Auto Play function in the Control Panel. However, be aware that if you do this you may be more subject to virus attack from portable media such as USB flash drives.

Configuring LAN

Hostname

The Computer Name, or Hostname, is preconfigured from the factory. It must be a unique name such that it does not conflict with other equipment on your LAN. The preconfigured Computer Name is K-<model number>-xxxxx, where xxxxx is the last 5 digits of the instrument's serial number.

IP Address & Gateway

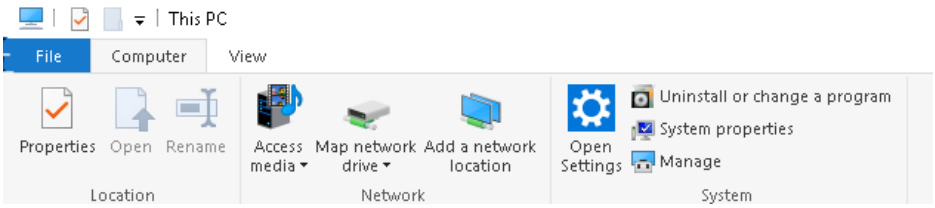
The instrument is preconfigured to obtain an IP Address via DHCP. You can change the IP Address and Gateway as you desire.

You must be logged in as an "Administrator" (default password:"Keysight4u!") to make changes.

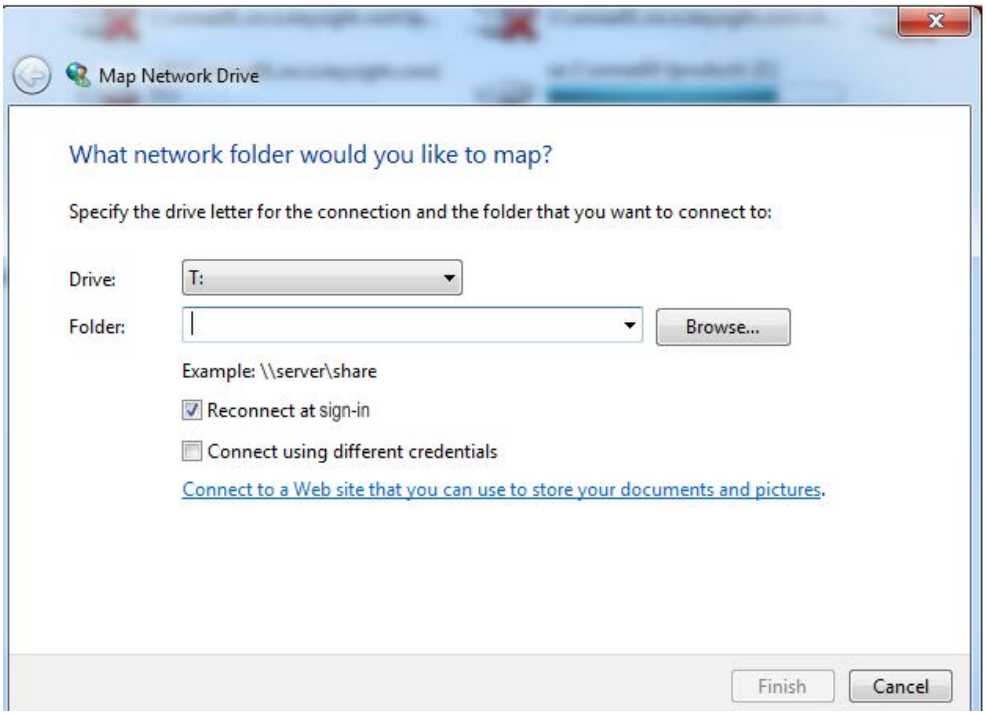
Connecting to a Network Shared Folder

The instrument contains standard Windows networking. The time required to authenticate is dependent on your LAN infrastructure. You may have improved performance by mapping a network drive to the shared folder that you need to access.

1. To map a network drive, Select the **Start** icon , **System Tools**, **Computer**.
2. Select the **Computer** tab, and select **Map Network Drive** from the dropdown menu.



3. Browse to the correct folder, and select **Finish**.



NOTE In Windows 10 there is no visual indication that authentication is in progress.

Windows Security

Microsoft recommends the following to ensure the instrument's Windows operating system is protected:

- Use an Internet firewall.
- Get the latest critical Windows updates.
- Use up-to-date anti-virus software.

Windows Firewall

The instrument is shipped with the Windows Firewall enabled. You can verify the status of Windows Firewall by going to the Control Panel and selecting Windows Firewall.

Windows Firewall Exceptions for programs and ports have been added to allow proper operation of the instrument over a network. Modifying these settings may cause the instrument to not operate properly.

Automatic Updates

Microsoft recommends that you always get the latest critical Windows updates to ensure that the instrument's Windows operating system is protected. If the instrument has Internet access, the instrument default is set to automatically check for critical Windows Updates and notify you.

You can change the configuration of the Microsoft Automatic Updates. You can choose not to have automatic updates. However, if you do this then you should manually update Windows periodically.

NOTE

Be aware that downloading and installing Windows Updates can be network and CPU usage intensive (impacting the instrument performance), and some Windows Updates automatically reboot the instrument. It is recommended that Windows Updates be performed when the instrument is not in normal use.

Virus Protection

There is no anti-virus software included with your instrument. It is recommended that users work with their own IT departments to determine what software should be installed.

NOTE **Having anti-virus software installed may have a slight impact on the instrument performance.**

Spyware Protection

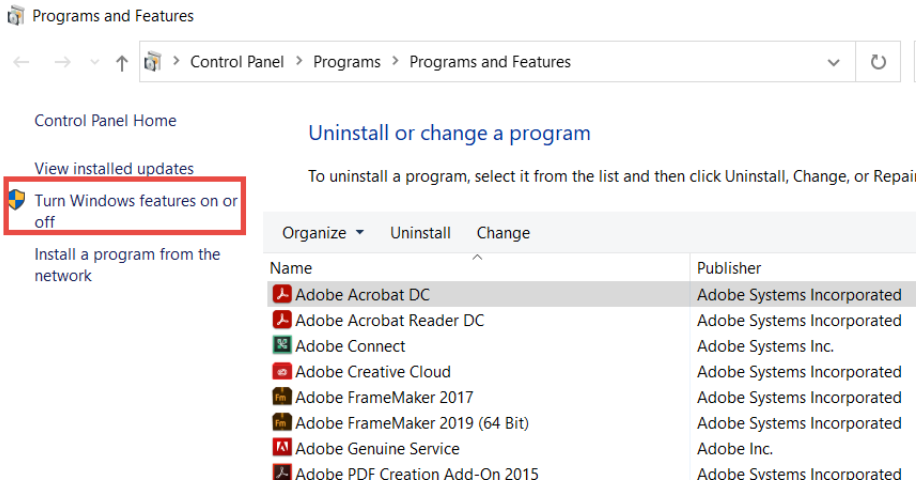
There is no anti-Spyware software installed on the instrument. This should not be a problem if you do not use the instrument for a lot of Internet browsing. Having Spyware in the instrument could have an impact on the instrument performance.

Installing and Using an FTP Server on Windows 10

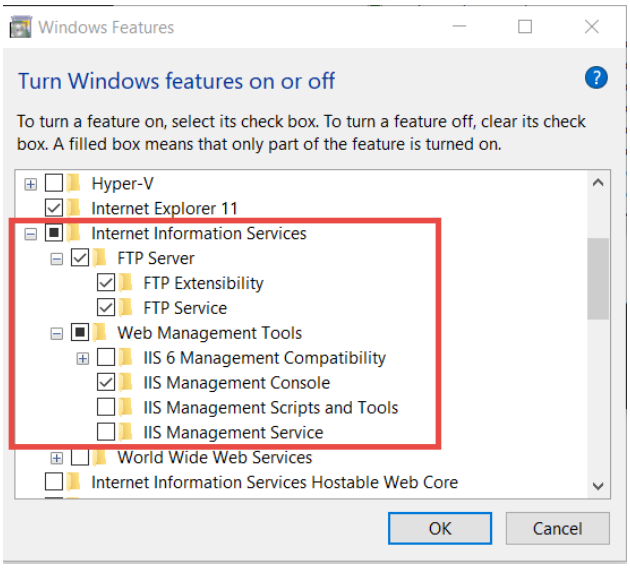
Windows 10 includes the necessary components to run an FTP server on the M9484C VXG.

To Install an FTP Server

1. From the Windows Start menu, select **Programs and Features** and then select **Turn Windows features on or off**.



2. Expand Internet Information Services and select:
   a. FTP Server and the FTP Extensibility option.
   b. Expand **Web Management Tools** and select **IIS Management Console**, or the default selections.
   c. Select **OK** to begin the installation. This will take a couple of minutes.

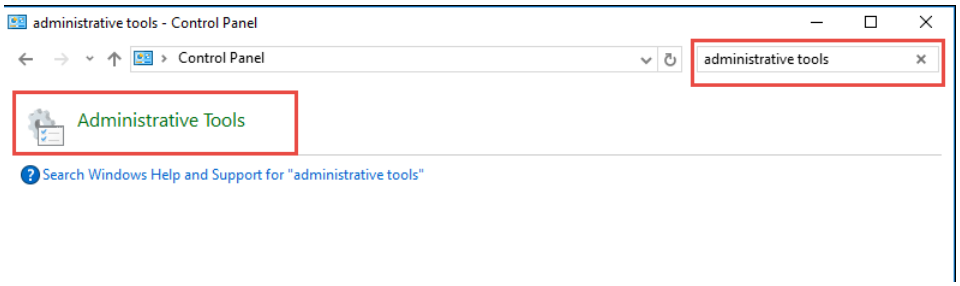


3. When the installation is complete, select **Close**.

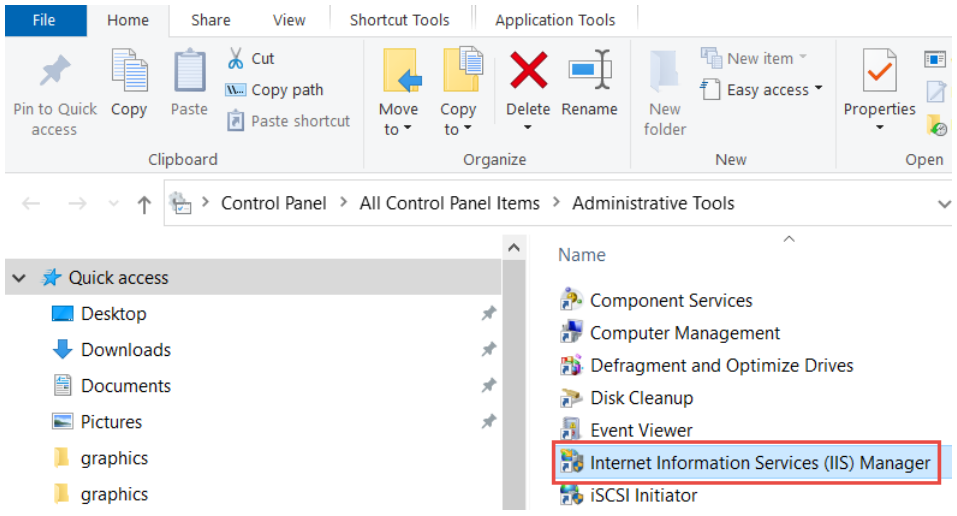
To Configure an FTP Site

After installation, you need to create an FTP site.

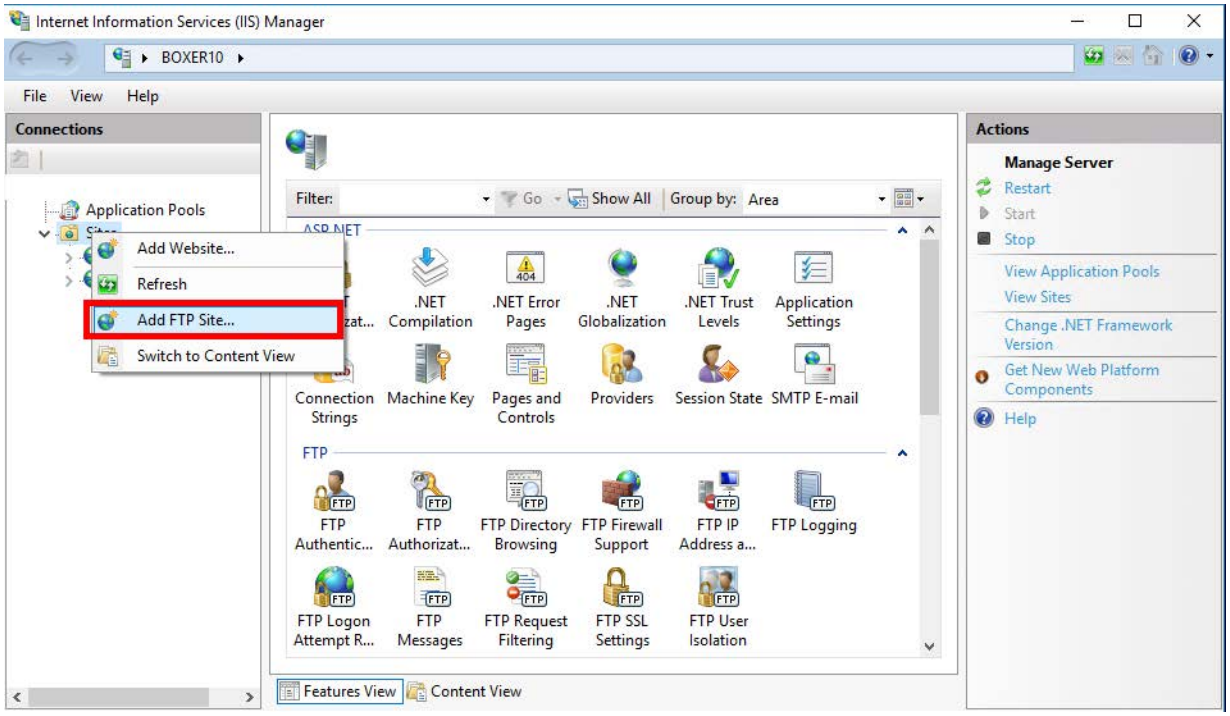
1. In the Program and Features dialog, select **Control Panel** and search for `Administrative Tools`, and then open.



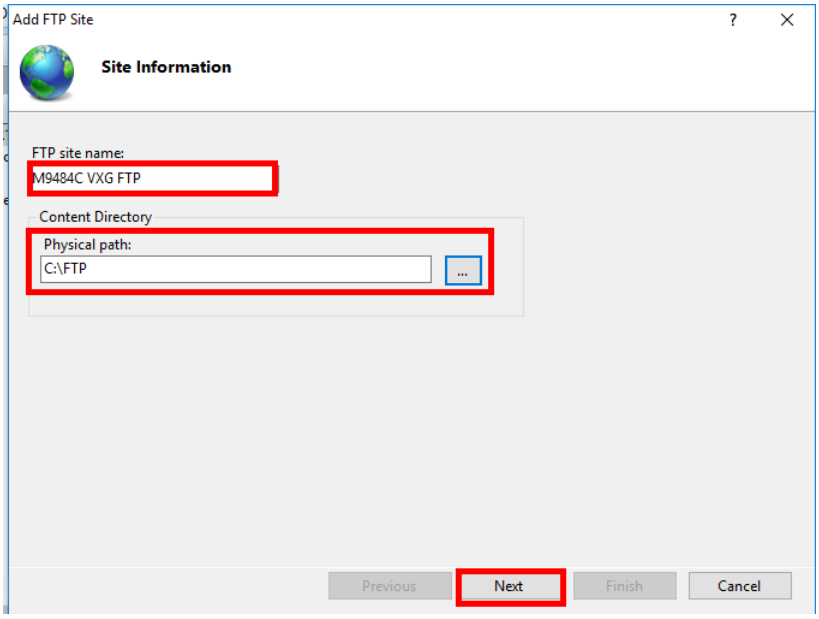
2. In the Administrative Tools dialog, double-click on **Internet Information Services**.



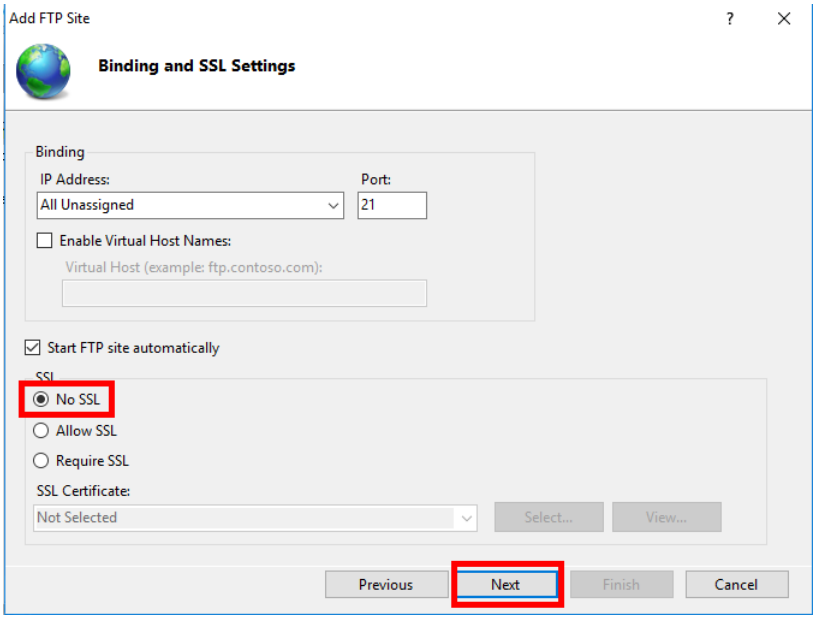
3. In the right pane, expand and right click on the **Sites**, and then select **Add FTP Site**.



4. Name your FTP site and then enter the path to the FTP folder where you want to send and receive files. Select **Next** to continue.



5. In the Binding and SSL Settings dialog, change the SSL setting to **No SSL**. Select **Next** to continue.

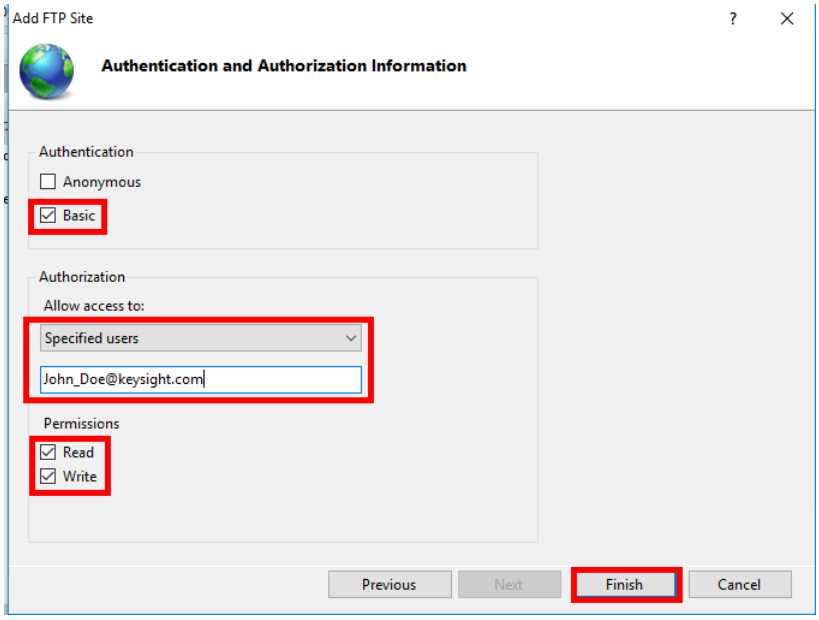


NOTE

On an FTP server that will host sensitive data, it is best to configure the site to require SSL. The <ssl> element specifies the FTP over Secure Sockets Layer (SSL) settings for the FTP service.

6. In the Authentication and Authorization Information dialog:
    a. Set Authentication to **Basic**.
    b. In Authorization, select **Specified users** from the dropdown menu.
    c. Enter the email address of t Windows 10 account or local account name to allow access to the FTP server. (More than one email address can be added by placing a semicolon in between addresses.)
    d. Select the **Read** and **Write** options.

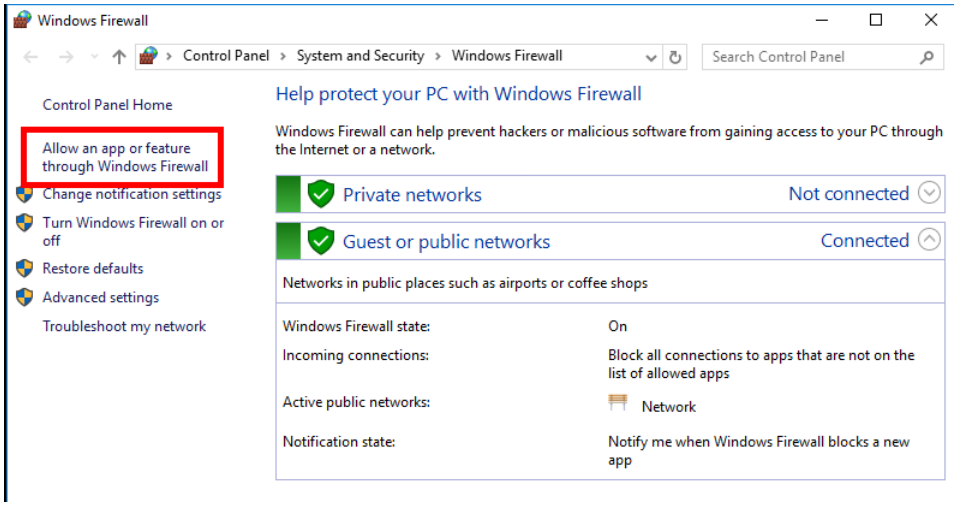
e. Select **Finish**.



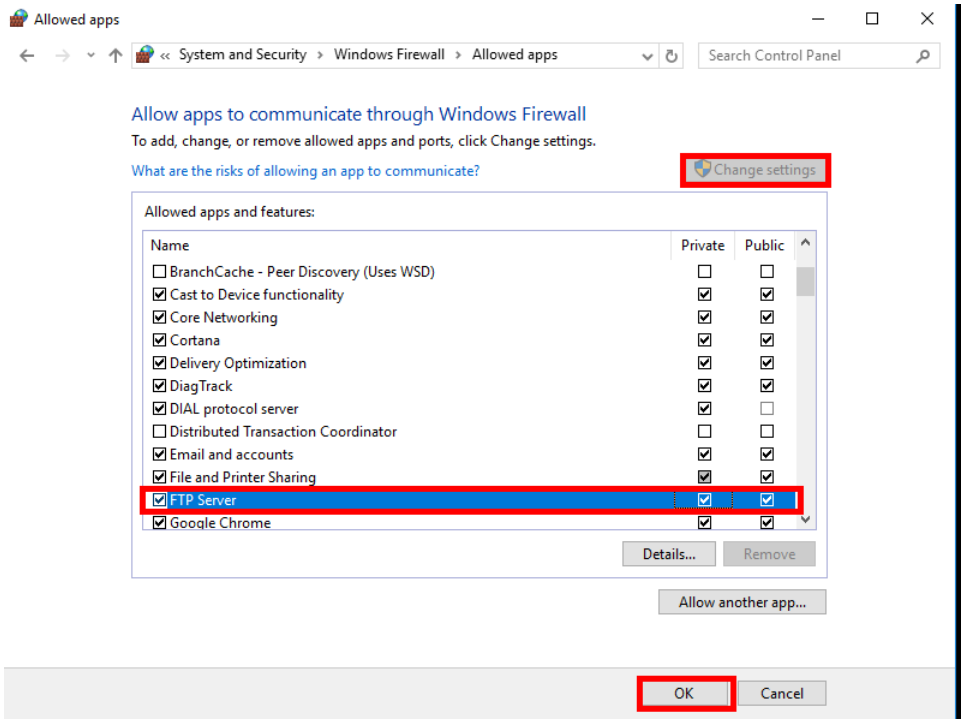
To Allow an FTP Server Through Windows Firewall

If you have Windows Firewall running on your VXG, then the security feature will block any connections trying to access the FTP server. Follow the steps below to allow the FTP server through the firewall.

1. In the Windows Start menu, search on `Windows Firewall` and open.
2. In the Windows Firewall dialog, select **Allow an app or feature through Windows Firewall**.



3. Select Change Settings. In the Allowed apps and features area, select **FTP** and select both **Private** and **Public** networks. Select **OK**.



Now you should be able to use your FTP client to connect to your newly created FTP server, from you local network.

NOTE

If you are using another security software then Windows Firewall, make sure to check your software vendor support website for specific instructions to allow an FTP server.

System Maintenance

Backup

It is recommended that you have a regular backup strategy. Your IT department may already have a backup strategy in place that is suitable for the instrument and its data. Using the Instrument Recovery system in conjunction with a regular backup strategy should allow full recovery of the instrument data.

Windows has a Backup utility that you can use to archive files and folders in case of a disk drive failure. You can also use third party backup utilities. However, you must ensure that this third party software is compatible with the instrument's system software. See “User Installation of Software” on page 86 for more information.

When performing backups, we recommend that you backup the data to an external storage device connected to the network or one of the instrument's USB connectors. Also, you should perform backups at times when the instrument is not being used for normal operations, as it may impact the instrument's overall performance.

System Restore

Windows contains the capability to restore the system to a previous point in time. System Restore is enabled with default settings as provided by Microsoft. However, System Restore is not always 100% successful. Therefore, it is not recommended that you rely on System Restore to protect your instrument. System Restore has not been tested to verify successful restoring.

Disk Defragmenting

The instrument has a solid state drive. Disk defragmenting is not recommended.

USB Connections

The two USB 3.0 Type A ports are compatible with the USB 2.0/3.0 and 1.1 specification. These ports can be used to connect USB mass storage devices and printers. The instrument USB Host support includes the standard Microsoft Windows USB drivers for human interface, mass storage, printing, scanning, and imaging devices. The USB 3.0 Type C connector is used only for connection to the Keysight V3080A Frequency Extender. (The V3080A is only available on the 32 GHz, 44 GHz, and 54 GHz instruments.) A complete up-to-date list of the Windows USB class driver support is available on the Microsoft website.

CAUTION

The front panel USB 3.0 Type C connectors do not have USB-compliant pin configurations. Do not use these ports for any USB devices as damage may occur.

Figure 3-1 Location of USB Ports

Keysight Technologies does not support or warrant correct instrument operation if additional USB drivers from third parties are installed in the instrument. It is possible that additional drivers could break the normal USB operation. If USB operation is broken, recovery would require reinstalling the instrument application using the Instrument recovery process.

Disk Drive Partitioning and Use

The drive is partitioned into 3 sections: C:, D: and E:

- The **C: partition** contains the Windows 10 operating system and software installed by Keysight. This is an Open System which means you can install additional software, and these should be installed on the C: drive. However, only a limited set of software applications are tested for use with the Keysight measurement software. The installation and/or use of other software is not warranted and could interfere with the operation of the measurement software. If instrument repair is ever needed, the Keysight version of the C: drive is the only part of the instrument software that is restored by the Instrument Recovery process. You must reload any other software that you have added in the instrument.
- The **D: partition** is reserved for data storage. The User Accounts that are configured by Keysight have their Documents folder mapped to the D: drive. This is for the convenience of backing-up the measurement data. You should always back-up the data on the D: drive to an external device. This allows you to restore the data if you ever need to replace the disk drive.
- The **E: partition** is reserved for Keysight's use. The primary use of the E: drive is for housing the Calibration and Alignment data. Do not change or overwrite the files on this drive. This could cause your instrument to not meet specifications, or even to stop functioning correctly. Do not use this drive for data storage.

Disk Drive Recovery Process

The Instrument Recovery System can be used to repair errors on the instrument's C: drive partition or to restore the original factory configuration of the system software on the disk drive. The Instrument Recovery System is stored in a separate hidden disk drive partition.

Restoring the original factory system software does not restore any of the following items:

- Additional software that has been installed after the instrument was shipped from the factory. (Thus, following an Instrument Recovery any software installed after the instrument was shipped from the factory will need to be re-installed.)
- System configurations (for example user accounts, windows configurations) that have been made after the instrument was shipped from the factory. (Thus, following an Instrument Recovery configuration changes will have to be performed.)
- The Instrument Recovery overwrites the contents of the C: partition. It does not affect the D: or E: partitions.

It is recommended that the user use a regular back up strategy. Your IT department may already have a backup strategy in place that is suitable for the instrument and its data. Using the Instrument Recovery System in conjunction with a regular back up strategy should allow you to fully recover the instrument's software and data.

Table 3-1 Recovery Process

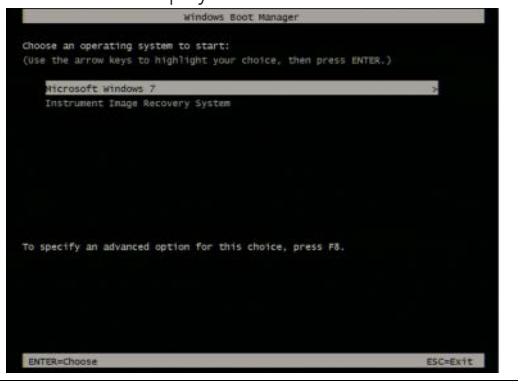
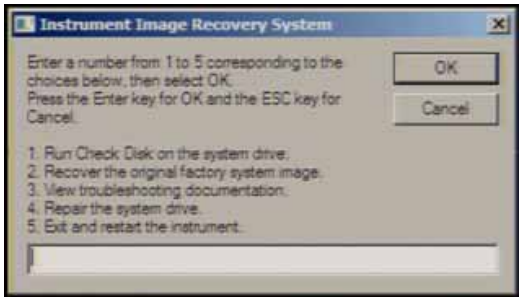
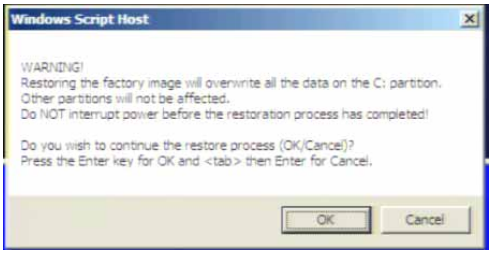
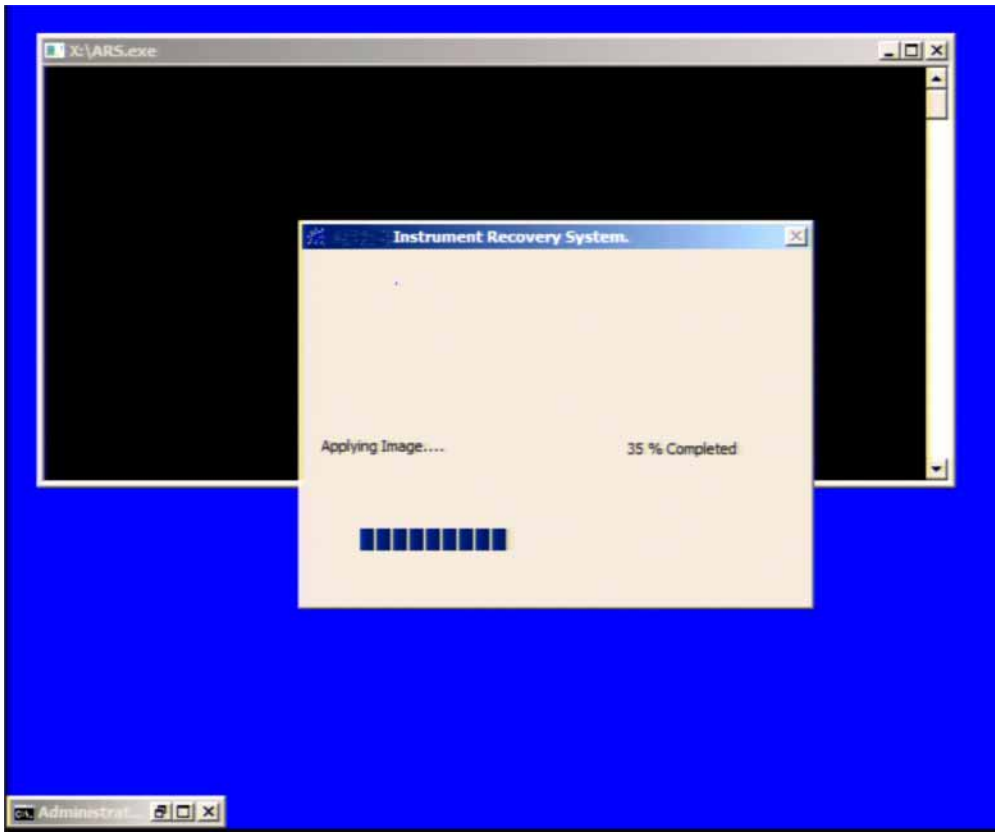
Step	Notes
1. Make sure the instrument is turned off.	
2. Turn on the instrument. – Press the down arrow key to move the highlight to **Instrument Recovery System**, then press **Enter**.	After the Keysight Technologies screen is displayed, This screen is displayed for five seconds. 

Table 3-1 Recovery Process

Step	Notes
3. When the Instrument Recovery System has booted, follow the on-screen instructions to recover the image of the C: drive. – Press **2**, then press **Enter** to select the recovery.	
4. A warning message appears. – Press **Enter** to start the recovery, which may take up to 25 minutes to complete.	
	
5. Press **Enter** to exit and reboot the instrument once this portion of the recovery has completed.	

NOTE Additional recovery steps may be required to fully recover the system to a more current working state. This could involve restoring your own backups of the instrument information or re-installing applications, data and performing system customizations.

Updating the Software (required after a recovery)

To install the latest software version, the software and installation instructions are available at:

Signal & Spectrum Analyzer Benchtop/Modular/Handheld Firmware Update Center

Table 3-2 Installing the Software

Step
1. Log out of the default user (instrument): – Select the Start icon  , select the **Change account settings icon**  ., **Sign out**.
2. At the log in prompt, enter: – User Name: **Administrator** – Password: **Keysight4u!**
3. Follow the instructions on the software update web page.
NOTE The installation process can take up to 45 minutes. **Do not** turn the instrument power off or serious damage may occur. If any pop up windows appear, click **OK** or **Ignore** to proceed.
4. After the instrument restarts, the newly installed version of the software will run.

4 Using Windows Tools

NOTE

The capabilities described in this section are Microsoft Windows 10 features. The discussion provided here gives some guidelines for using the capabilities with the instrument. You need to refer to the Windows 10 help documentation for more information. Your version of Windows may not match these instructions exactly.

You need an external keyboard and mouse to fully use these features.

"Navigating Windows Without a Mouse" on page 108

"Remote Desktop: Using the Signal Generator Remotely" on page 109

"Windows Shortcuts and Miscellaneous Tasks" on page 117

Navigating Windows Without a Mouse

Key Presses	Actions
F1	Displays the Application Help.
Esc	Exits/closes a Windows dialog box (does not exit an Application window)
Enter	Does the current default action. If a menu item or a button is currently highlighted, then the Enter key activates that menu item or button.
Alt	Moves focus/control to the pull down menus bar in the active Window
Right Arrow	In pull-down menu: opens the next menu to the right, or opens a submenu In a dialog box: selects an option button
Left Arrow	In pull-down menu: opens the next menu to the left, or opens a submenu In dialog box: selects an option button
Up Arrow	In pull-down menu: Moves to next selection up in the menu In dialog box: selects an option button
Down Arrow	In pull-down menu: Moves to next selection down in the menu In dialog box: selects an option button
Tab	In dialog box: moves to the next/previous field
Del	Deletes the currently selected item
Alt + Tab	Switches between the next/previous application
Alt + Enter	Shows the Properties of the currently selected item
Alt + Esc	Cycles through items in the order that they had been opened
Backspace	In My Computer or Windows Explorer: move up one level In Internet Explorer: works like the BACK arrow key
Ctrl + Left arrow	Moves to the left one word at a time
Ctrl + Right arrow	Moves to the right one word at a time
Ctrl + Tab	In dialog box: moves to the next/previous Tab location
Ctrl + Esc	Opens the Windows Start Menu
Ctrl + Alt + Delete	Opens a window that enables you to select the Windows Task Manager

Remote Desktop: Using the Signal Generator Remotely

Windows Remote Desktop is recommended for remote control of the instrument. It offers fully-interactive control that is almost identical to direct face-to-face control of the instrument.

NOTE

The Remote Desktop functionality is a Microsoft Windows 10 capability. The following discussion provides some guidelines for using this capability with the instrument. You need to refer to the Windows 10 help documentation for more information. As Windows evolves, these instructions may no longer be exact.

Overview of Remote Desktop operation

NOTE

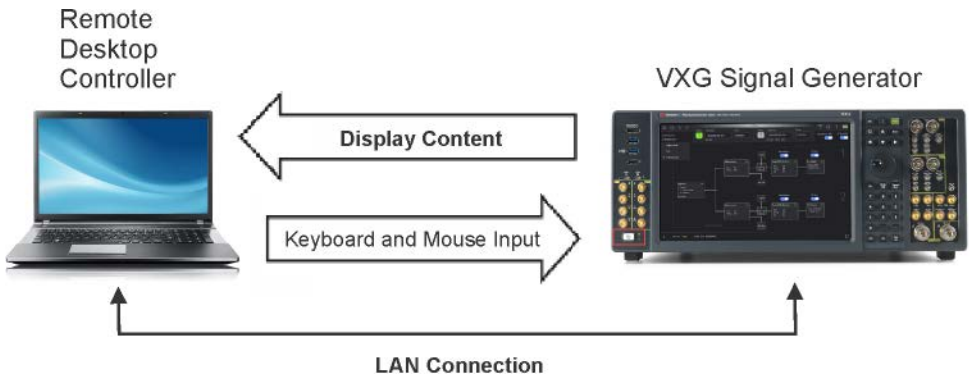
To perform this operation successfully, you must have Administrator level access to the instrument.

Using the Remote Desktop functionality of the instrument allows you to control and interact with the instrument from a remote computer as though you were sitting in front of the instrument.

When you have configured the instrument for remote connectivity, and configured a separate computer to act as a Remote Desktop Host, you can send commands to the instrument from the remote computer, and you can see the instrument display on the screen of the remote computer.

This section provides full details of how to set up the instrument for remote connectivity, and also how to set up a computer running any version of Microsoft Windows as a Remote Desktop Host.

Figure 4-1 Basic setup for remote desktop operation



Enabling Copy and Paste or File Sharing

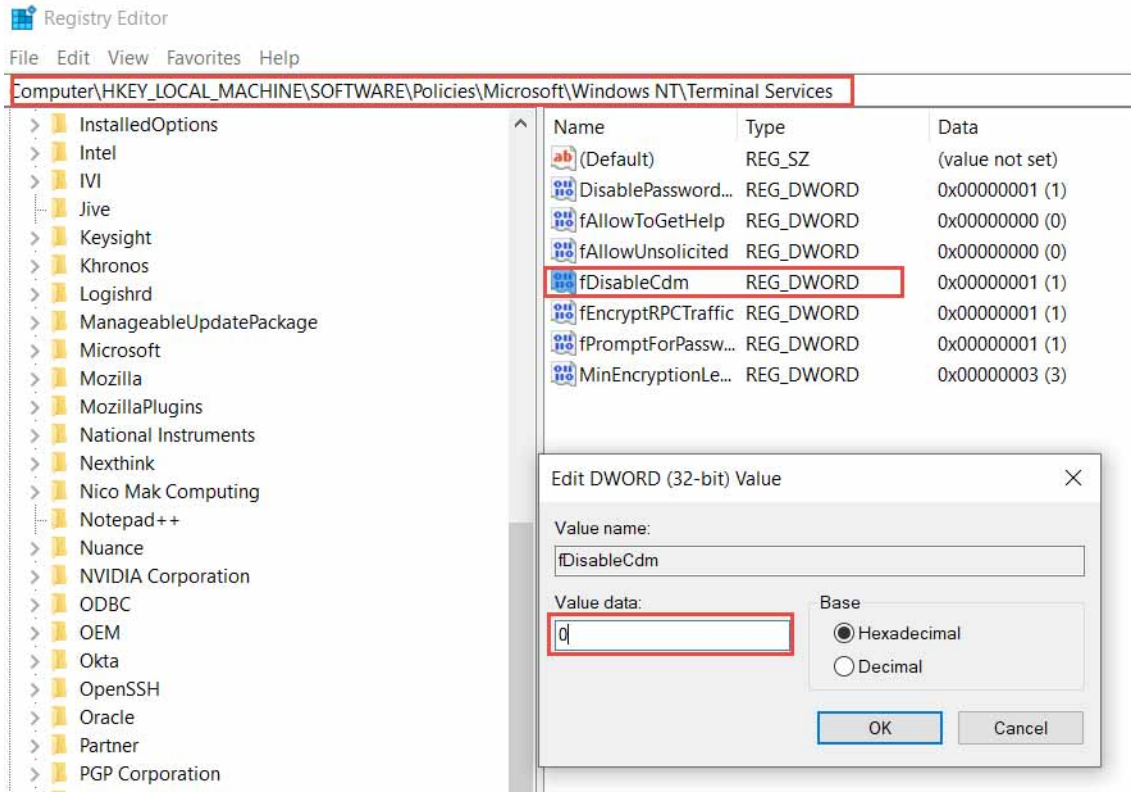
For security purposes the instrument comes from the factory with copy and paste and file sharing disabled in Remote Desktop.

To enable edit the registry:

1. From the **Start** menu, select **Registry Editor**.
2. In the left pane of the Registry Editor window, navigate to:

   `HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows NT\Terminal Services`
3. Select **fDisbaleCdm** and set Value data to 0, then select **OK**.

Figure 4-2 Registry Editor setup



Setting Up Remote Desktop Operation On the Instrument

The instrument comes from the factory configured for Remote Desktop with the Administrator and Instrument user accounts. If you have added your own accounts follow the procedure in Table 4-1.

Table 4-1 Setting up a remote desktop connection

Step	Action
1. On the instrument, open the Windows Control Panel	From the instrument application, select **System** > **Control Panel,**
2. Select System functions	From the **Adjust your computers settings** menu, click **System**.
3. Access Remote setting	In the **Control Panel Home** window, select **Remote settings**
4. Select the Remote option	On the **Remote** tab, in the **Remote Desktop** section, select the appropriate checkbox.
5. To add users	Choose **Select Users**> **Add**.
6. Follow the on screen instructions.	

Setting Up the Remote Computer

The procedure depends on whether the Remote Computer to be set up is running Windows 10, or another version of Microsoft Windows.

Remote Computer Running Windows 10

Windows 10 includes the Remote Desktop Connectivity Client software, so no additional setup is required.

Remote Computer Running Another Version of Windows

You can use any version of Windows to install and run the Client software for Remote Desktop Connectivity. However, you need to have available a Windows installation CD-ROM, because that contains the Client software.

NOTE

The following instructions relate to software provided by Microsoft Corporation. Keysight offers no warranty regarding the operation of such software. The procedure described here may be changed by Microsoft at some future time.

Table 4-2 Installing the Client software

Step	Notes
1. When the Welcome Screen appears, select **Perform additional tasks**	
2. From the **What do you want to do?** screen, select **Set up Remote Desktop Connection**.	The Remote Desktop Connection InstallShield Wizard appears.
3. Select **Next**.	Follow the on screen instructions provided by the Wizard.
4. To access the installed software, select **Start** > **All Programs** > **Accessories** > **Communications** > **Remote Desktop Connection**.	

How to Locate the Computer Name of the Instrument

To connect a remote computer to the instrument, you need to know its Computer Name. The Computer Name can be displayed as follows:

Table 4-3 Locating the name from the Keysight application

Step	Notes
On the instrument front panel, select  > **System**.	A page listing various parameters appears.The instrument's computer name is shown in the list next to the title Computer Name.

Table 4-4 Locating the name from the Windows desktop (using a mouse)

Step	Notes
Select **Start** > **Control Pane**l > **System**	The Computer name is listed in the Computer name, domain, and workgroup settings section.

Running a Remote Desktop Session

Initializing a Remote Desktop Session

NOTE

To initialize a Remote Desktop Session, you need to know the Computer Name of the instrument.

Table 4-5 Starting a session

Step	Notes
1. Select the Windows **Start** menu and type `Remote Desktop Connection` to locate the application.	A Remote Desktop Connection dialog appears: 
2. Enter the computer name of the instrument.	
3. Select **Connect**.	A login dialog box appears.
4. Enter the login account name and password.	The default account name is **Instrument** and the default password is **measure4u**, but these parameters may be changed by instrument users.

NOTE

Only the current User or an Administrator can remotely log into the instrument. To see who the current user of the instrument is, press **Ctrl**+**Esc** on the instrument until you can view the current user name on the Start menu. If no one is currently logged into the instrument, any valid instrument user can remotely log in.

The instrument display appears on the screen of the remote computer.

Windows Remote Desktop Options

Table 4-6 Setting Remote Desktop options

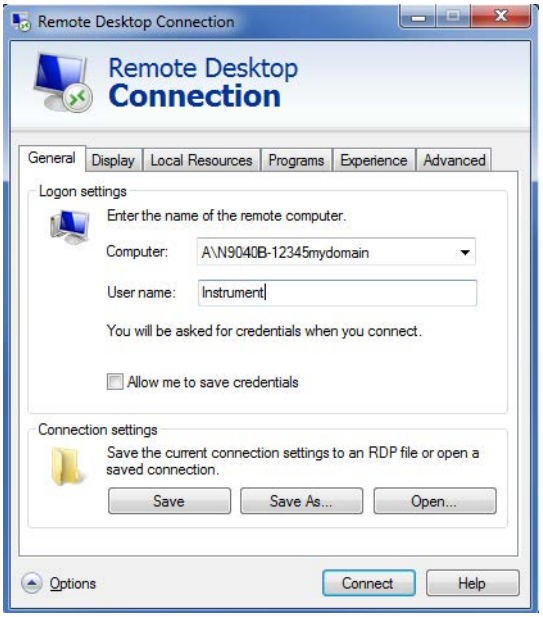
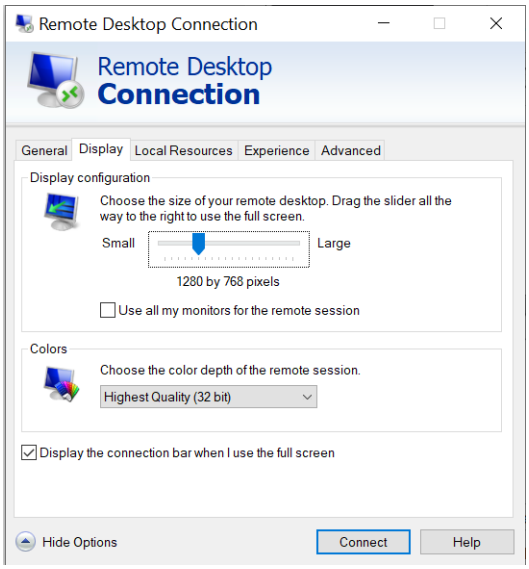
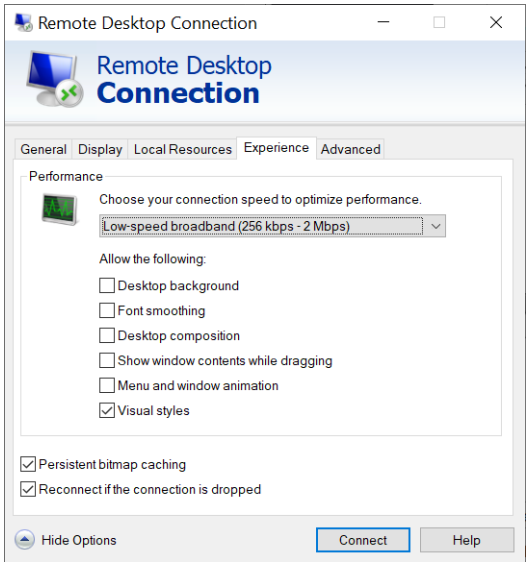
Step	Notes
1. On the Remote Desktop Connection menu, select **Options**.	 The Options dialog has several tabs. Generally, the default settings are correct.
2. Under the **General** tab, ensure that the Computer name, User name and Domain name are set correctly.	You may choose to enter the password and save it for future sessions, by selecting the **Save my password** box.

Table 4-6 Setting Remote Desktop options

Step	Notes
3. Select the **Display** tab. – Under **Display configuration,** set the size to 1280 by 768.	
4. Select the **Experience** tab.	To Optimize the performance of the Remote Desktop session, choose the appropriate connection format from the drop-down list. 

Ending a Remote Desktop Session

There are two ways to disconnect the remote computer from the instrument: ending the session:

Table 4-7 Ending a session

Step	Notes
1. Select the **X**, then **OK**.	For full-screen, the X appears at the top center of the window. For non full-screen, the X appears in a red box at the right of the window's title bar.
or	
2. When the remote desktop is full screen, move the cursor to the bottom left of the window: – Select **Start** > **Disconnect**. – Select **Disconnect**.	You are asked to confirm that you want to disconnect.

Windows Shortcuts and Miscellaneous Tasks

This section provides a list of windows shortcuts (key combinations) that are useful when you operate the instrument without an attached mouse and keyboard. See also “Navigating Windows Without a Mouse”.

Although these shortcuts are available in any Windows 10 system, they are not commonly used when a mouse and keyboard are attached.

Windows Shortcuts (key combinations)

You can use the following combinations of front panel keys to perform basic windows tasks when using the instrument without an attached mouse and keyboard.

Table 4-8 Windows shortcut key combinations

To do the following:	Press:
Display the Windows Start Menu	**Ctrl**+**Esc**
Cycle through all open applications	**Alt**+**Tab**
Select the first menu of a menu bar	**Alt**
Move through menu headings	**Left Arrow**, **Right Arrow**
Open (drop down) a menu	**Down Arrow**
Move through items in an expanded menu	**Up Arrow**, **Down Arrow**
Close the current menu selection	**Esc**
Cancel the current menu bar selection	**Alt**
Open an application's control menu (usually the left-most menu on the menu bar, starting with `File`)	**Alt**+**Down Arrow**
In a dialog: move between tabs	**Ctrl**+**Tab**
In a dialog: move forward through dialog box items	**Tab**
In a dialog: move backward through dialog box items	**Shift**+**Tab**
In a dialog: open a list box	**Alt**+**Down Arrow**
In a dialog list box or check box: select or clear one item at a time	**Shift**+**Up Arrow**, **Shift**+**Down Arrow**
In `My Computer`, expand a selected folder	**Enter**
In `My Computer`, open a folder one level up from the current folder	**Bk Sp**

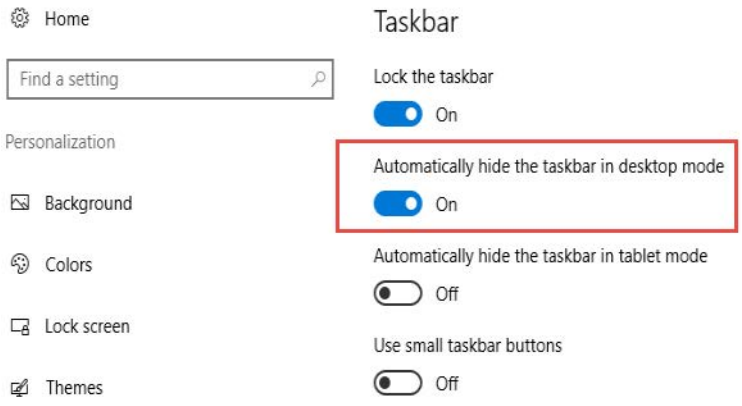
Windows Taskbar Auto-hide Feature

The Windows taskbar should always be in the auto-hide mode when using the instrument application. If the taskbar is not set to auto-hide, the lower part of the instrument display is obscured by the taskbar.

If at any time the Windows taskbar is inadvertently set to the non-auto-hide mode, you can restore the auto-hide behavior by doing the following:

Table 4-9 Restoring taskbar auto-hide mode

Step	Notes
1. Select **Start** > **Control Panel**	If not using a mouse, press **Ctrl**+**Esc.**
2. Select **Taskbar and Navigation**	If you are not using a mouse, use the shortcut key combinations specified in the Section "Windows Shortcuts (key combinations)" on page 118 to make these selections.
3. Select **Auto-hide the taskbar in desktop mode**	If you are not using a mouse, press **Tab** repeatedly until the auto-hide option is selected, then press **Select** to toggle the checkbox state.



5 Removable Solid State Drive (SSD)

The following topics can be found in this section:

"Overview" on page 122

"Putting the Additional SSD Into Service" on page 123

"SSD Interconnect Life Expectancy" on page 124

"SSD Removal and Installation" on page 125

"Firmware Updates" on page 126

"Instrument Security Information" on page 127

Overview

Keysight provides a removable Solid State Drive (SSD) for your M9484C VXG. If you order Y1277A along with your M9484C VXG, follow the instructions below.

The SSD is mounted in a receptacle on the rear panel of the M9484C chassis and can be easily inserted or removed. This is convenient when multiple people are using the same VXG and they do not want to interfere with the other person's project or for use in a controlled secure environment.

Putting the Additional SSD Into Service

When ordered at the time of an instrument purchase, the additional SSD will have the following already installed:

- The same version of instrument software/firmware that is also installed in the instrument.
- The instruments computer name.
- Instrument specific configurations.

Contact Keysight to install existing M9484C options onto the new SSD drive.

Refer to "Calling Keysight Technologies" on page 140.

SSD Interconnect Life Expectancy

The life expectancy of both the connector on the removable SSD and the mating connector internal to the instrument is 100 cycles. If this is exceeded it is very likely that a failure will occur between these connections. Keysight highly recommends that this cycle limit not be exceeded to prevent an unwanted failure of the instrument.

SSD Removal and Installation

CAUTION

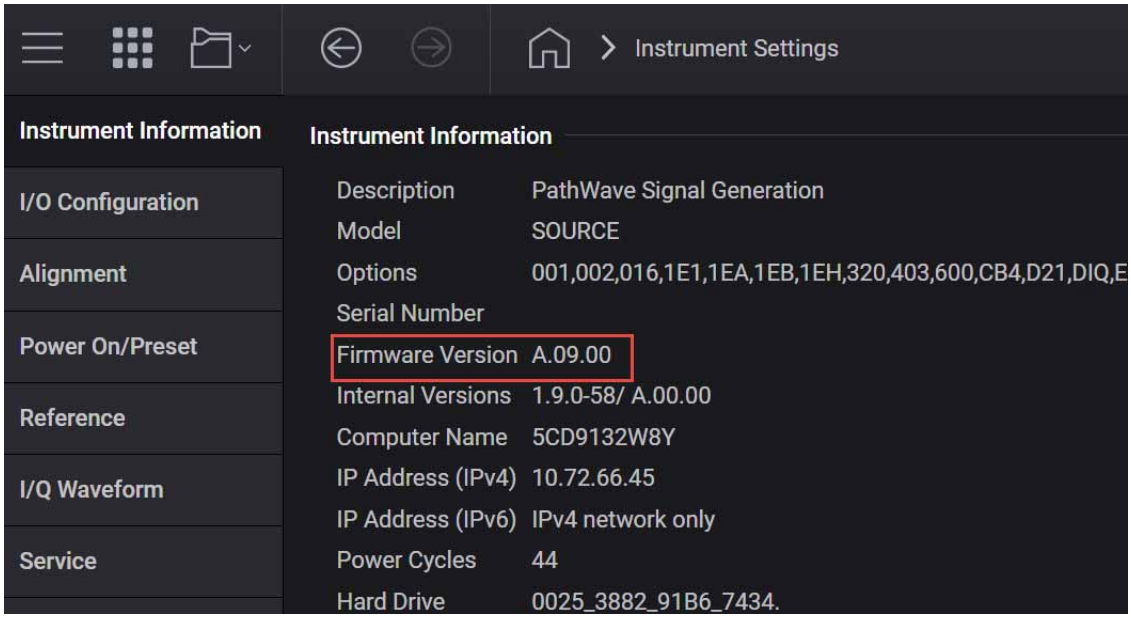
Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. Refer to the documentation that pertains to your instrument for information about static-safe workstations and ordering static-safe accessories.

1. Turn the instrument off and remove the AC power cord.
2. Remove the screw as shown in the figure below. Use a T10 Torx driver if necessary.

3. Pull on the handle to unseat the SSD and remove the SSD.
4. Install the new SSD by aligning the SSD PC board edges with the card guides. Insert the SSD completely.
5. Tighten the screw to no more than 9 in-lbs.

Firmware Updates

To determine the currently installed instrument firmware version on the VXG, select the **Triple-bar** icon > **Settings** > **Firmware Version**.



If an instrument firmware update is required, the latest revision of the firmware can be found by going to:

https://www.keysight.com/us/en/product/M9484C/m9484c.html

and selecting the **Drivers, Firmware, and Software** tab.

Instrument Security Information

Information on the instrument security features and the instrument volatility can be found at:

http://www.keysight.com/find/security

6 Safety and Maintenance Information

The following topics can be found in this section:

"Safety Information" on page 130

"Warnings, Cautions, and Notes" on page 131

"Instrument Markings" on page 136

"Instrument Maintenance" on page 139

"Returning an Instrument for Service" on page 140

Safety Information

IMPORTANT The safety of any system incorporating the equipment is the responsibility of the assembler of the system.

IMPORTANT Proper Ergonomics should be considered when using accessories such as a keyboard or a mouse.

IMPORTANT When installing the instrument(s) into a cabinet, consideration shall be given to the convection flow into and out of the cabinet. Consideration shall also be given to the individual instruments to avoid having the heated discharge of one instrument, now becoming the cooling intake air for another instrument. Another area of concern is verification that the maximum ambient operating temperature of the instrument(s) is not exceeded by cabinet installation. Keysight recommends forced air convection whenever an instrument(s) are installed in a cabinet and further recommends that the maximum operating temperature of the cabinet be reduced 10°C from the lowest, of the maximum operating temperature of a single instrument. If there are any concerns or special requirements a Keysight Field Engineer should be consulted to assure instrument(s) temperature compliance and performance.

Warnings, Cautions, and Notes

The documentation for this product uses the following safety notations. Familiarize yourself with each notation and its meaning before operating the signal generator.

WARNING

Warning denotes a hazard. It calls attention to a condition or situation that could result in personal injury or loss of life. Do not proceed beyond a warning until you fully understand the indicated conditions or situations.

CAUTION

Caution calls attention to a condition or situation that could result in damage to or destruction of the signal generator, or in the loss of a user's settings or data. Do not proceed beyond a caution until you fully understand the indicated conditions.

NOTE

Note calls the user's attention to an important point or special information in the text.

General Safety Considerations

WARNING If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

WARNING The M9484C VXG is heavy and requires two people to lift and carry it. Instrument is front heavy.Do not attempt to lift or carry it on your own.

NOTE This product has been designed and tested in accordance with accepted industry standards, and has been supplied in a safe condition. The documentation contains information and warnings that must be followed by the user to ensure safe operation and to maintain the product in a safe condition.

NOTE The M9484C is a Class 1 laser product.

Before Applying Power

WARNING Use a Keysight supplied power cord that has the same or better electrical rating.

WARNING Capable of rendering an electrical shock or burn.

WARNING Install the instrument so that the detachable power cord is readily identifiable and is easily reached by the operator. The detachable power cord is the instrument disconnecting device. It disconnects the mains circuits from the mains supply before other parts of the instrument. The front panel switch is only a standby switch and is not a LINE switch. Alternatively, an externally installed switch or circuit breaker (which is readily identifiable and is easily reached by the operator) may be used as a disconnecting device.

WARNING This is a Safety Protection Class I Product (provided with a protective earthing ground incorporated in the power cord). The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. Any interruption of the protective conductor inside or outside of the product is likely to make the product dangerous. Intentional interruption is prohibited.

WARNING **High power consuming equipment. Carefully read the safety information provided with your product. Verify the installation conditions are suitable to safely provide power to your equipment.**

WARNING **DO NOT use a power strips which is not suitable for the installation. These devices may not be sufficiently rated to carry the required current and may become a safety hazard.**

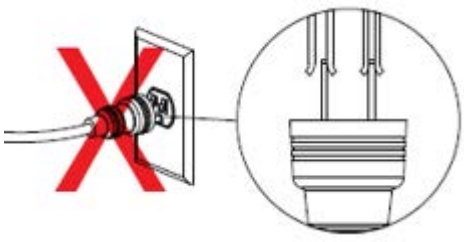
WARNING **DO NOT use extension cords to power your equipment.**

WARNING **DO NOT use any converters or adapters.**

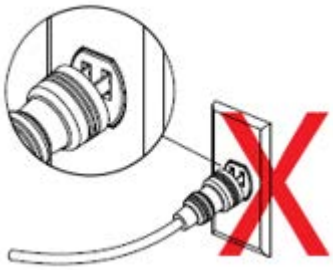
WARNING **The AC Voltage source (outlet) must be in proper working order and provide a secure electrical connection.**

Do not use the outlet if the power cord does not match the outlet. Do not use the outlet if it is damaged or if the voltage is outside the required range.

WARNING **DO NOT use outlet if the power cord makes a loose connection.**



WARNING **DO NOT allow plug to bend down or become loose.**



WARNING Cleaning connectors with alcohol shall only be done with the instruments power cord removed, and in a well-ventilated area. Allow all residual alcohol moisture to evaporate and the fumes to dissipate prior to energizing the instrument.

CAUTION The instrument has an auto–ranging line voltage input – be sure the supply voltage is within the specified range and the voltage fluctuations do not exceed 10 percent of the nominal supply voltage.

CAUTION The measuring terminals on this instrument are designed to be used with external signals described in Measurement Category I, but NOT with external signals described in Categories II, III, and IV. The input of this instrument cannot be connected to the mains.

CAUTION The Mains wiring and connectors shall be compatible with the connector used in the premise electrical system. Failure to ensure adequate earth grounding by not using the correct components may cause product damage, and serious injury.

NOTE The main power cord can be used as the system disconnecting device. It disconnects the mains circuits from the mains supply.

Servicing

WARNING These servicing instructions are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing unless you are qualified to do so.

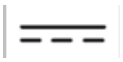
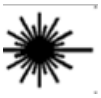
WARNING No operator serviceable parts inside. Refer servicing to qualified personnel. To prevent electrical shock do not remove covers.

Operating Conditions

CAUTION This product is designed for use in Installation Category II and Pollution Degree 2.

Instrument Markings

The table below lists the definitions of markings that may be on or with the product. Familiarize yourself with each marking and its meaning before operating the signal generator.

Marking	Description
	This symbol marks the standby position of the power line switch.
	This symbol marks the ON position of the power line switch.
	This symbol marks the OFF position of the power line switch.
	This symbol indicates that the input power required is AC.
	This symbol indicates DC voltage
	This symbol indicates a three-phase alternating current.
	This symbol indicates Frame or chassis Terminal.
	The instruction documentation symbol. The product is marked with this symbol when it is necessary for the user to refer to the instruction in the documentation.
	This symbol indicate the presence of a Laser device.
	This symbol indicates the surface can be hot.
	This symbol indicated the product is sensitive to electrostatic discharge.
	This symbol identifies the Protective Conductor terminal.
	This symbol indicates the equipment is protected throughout by double or reinforced insulation.

Marking	Description
	The RCM mark is a registered trademark of the Australian Communications and Media Authority.
	This is a space saver label that combines three markings - CE with CAN ICES and ISM (see above) and ISM (see below).
	The UK conformity mark is a UK government owned mark. Products showing this mark comply with all applicable UK regulations.
	The Keysight email address is required by EU directives applicable to our product.
	The CSA mark is a registered trademark of the CSA International.
	Two person lift required.
CAN ICES/NMB-001(A)	Canada EMC label. Interference-Causing Equipment Standard for industrial, scientific and medical (ISM) equipment. Matériel industriel, scientifique et médical (ISM).
	CE/ICES/ISM Label. (Old mark for reference only). This is a space saver label that combines three markings - CE with CAN ICES (see above) and ISM (see below).
CAN ICES/NMB-001(A) ISM GRP 1-A	This is a space saver label that combines two markings - CAN ICES and ISM.
ISM 1-A	This is a symbol of an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 5).
	South Korean Certification (KC) mark. It includes the marking's identifier code.
	The crossed-out wheeled bin symbol indicates that separate collection for waste electric and electronic equipment (WEEE) is required, as obligated by the EU DIRECTIVE and other National legislation. Please refer to www.keysight.com/go/takeback to understand your trade-in options with Keysight, in addition to product takeback instructions.

Marking	Description
	China Restricted Substance Product Label. The EPUP (environmental protection use period) number in the center indicates the time period during which no hazardous or toxic substances or elements are expected to leak or deteriorate during normal use and generally reflects the expected useful life of the product.
	Universal recycling symbol. This symbol indicates compliance with the China standard GB 18455-2001 as required by the China RoHS regulations for paper/fiberboard packaging.
IP x y	This mark indicates product has been designed to meet the requirements of "IP x y", where "x" is the solid particle protection and "y" is the liquid ingress protection.

Instrument Maintenance

Cleaning the instrument

To remove dirt or dust from the external case of the M9484C VXG, clean the case using a dry or slightly-dampened cloth only.

Cleaning Connectors

Cleaning connectors with alcohol shall only be done with the instrument power cord removed, and in a well-ventilated area. Allow all residual alcohol moisture to evaporate, and the fumes to dissipate prior to energizing the instrument.

WARNING **To prevent electrical shock, disconnect the instrument from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.**

Returning an Instrument for Service

Calling Keysight Technologies

Keysight Technologies has offices around the world to provide you with complete support for your instrument. To obtain servicing information or to order replacement parts, contact the nearest Keysight Technologies office listed below. In any correspondence or telephone conversations, refer to your instrument by its product number, full serial number, and software revision.

Locations for Keysight Technologies

Online assistance: http://www.keysight.com/find/assist

Americas

Canada 1 877 894 4414	Latin America (305) 269 7500	United States 1 800 829 4444

Asia Pacific

Australia 1 800 629 485	China 800 810 0189	Hong Kong 800 938 693
India 1 800 112 929	Japan 0 120 (421) 345	Korea 080 769 0800
Malaysia 1 800 888 848	Singapore 1 800 375 8100	Taiwan 0800 047 866
Thailand 1 800226 008		

Europe & Middle East

Austria 43 (0) 1 360 277 1571	Belgium 32 (0) 2 404 93 40	Denmark 45 70 13 15 15
Finland 358 (0) 10 855 2100	France 0825 010 700* *0.125 Euros/minute	Germany 49 (0) 7031 464 6333
Ireland 1890 924 204	Israel 972-3-9288-504/544	Italy 39 02 92 60 8484
Netherlands 31 (0) 20 547 2111	Spain 34 (91) 631 3300	Sweden 0200-88 22 55
Switzerland 0800 80 53 53	United Kingdom 44 (0) 118 9276201	

Other European Countries: http://www.keysight.com/find/contactus

Service Options

Keysight Technologies offers several optional maintenance plans to service your instrument after the warranty has expired. Call your Keysight Technologies office for full details.

If you want to service the instrument yourself after the warranty expires, you can download the service documentation that provides all necessary troubleshooting and maintenance information from the Keysight web page.

Packaging the Instrument

Use original packaging or comparable. It is best to pack the unit in the original factory packaging materials if they are available.

WARNING

Instrument damage can result from using packaging materials other than those specified. Never use styrene pellets in any shape as packaging materials. They do not adequately cushion the equipment or prevent it from shifting in the carton. They cause equipment damage by generating static electricity and by lodging in the instrument louvers, blocking airflow.

NOTE

M9484C Rear Panel and Front Panel jumper cables (PN: W1312-20627 and W1312-20626) come with protective caps to protect them from impact damage during shipping. When returning an instrument for service, reinsert the protective caps (if available) or remove the cables and place them in a separate protective bag.

You can repackage the instrument with commercially available materials, as follows:

Table 6-1

Step	Notes
1. Wrap the instrument in anti-static plastic to reduce the possibility of damage caused by electrostatic discharge	
2. Use a strong shipping container.	The carton must be both large enough and strong enough to accommodate the instrument. A double-walled, corrugated cardboard carton with 159 kg (350 lb) bursting strength is adequate. Allow at least 3 to 4 inches on all sides of the instrument for packing material.

Table 6-1

Step	Notes
3. Surround the equipment with three to four inches of packing material and prevent the equipment from moving in the carton.	If packing foam is not available, the best alternative is plastic bubble-pack. This material looks like a plastic sheet filled with 1-1/4 inch air bubbles. Use the pink-colored bubble which reduces static electricity. Wrapping the equipment several times in this material should both protect the equipment and prevent it from moving in the carton.
4. Seal the shipping container securely with strong nylon adhesive tape.	
5. Mark the shipping container "**FRAGILE, HANDLE WITH CARE**" to assure careful handling.	
6. Retain copies of all shipping papers.	

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