

# Keysight Technologies

## U9361 C/F/G/M Receiver Calibrator



Quick Start  
Guide

# Notices

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## **Manual Part Number**

U9361-90001

## **Edition**

Edition 1, October 2021

Supersedes: March 2021

Printed in USA

Published by:

Keysight Technologies, Inc.

1400 Fountaingrove Parkway

Santa Rosa, CA 95403

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## Where to Find the Latest Information

Documentation is updated periodically. For the latest information about these products, including instrument software upgrades, application information, and product information, browse to one of the following URLs, according to the name of your product:

<http://www.keysight.com/find/u9361c>

<http://www.keysight.com/find/u9361f>

<http://www.keysight.com/find/u9361g>

<http://www.keysight.com/find/u9361m>

To receive the latest updates by email, subscribe to Keysight Email Updates at the following URL:

<https://support.keysight.com>

Information on preventing instrument damage can be found at:

<http://keysight.com/find/PreventingInstrumentRepair>

Product specific information and support, software and documentation updates:

<http://www.keysight.com/find/rcal>

### 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>

## ESD Information

### Protection from Electrostatic Discharge

Electrostatic discharge (ESD) can damage or destroy electronic components. All work on electronic assemblies should be performed at a static-safe workstation. **Figure 1** shows an example of a static-safe workstation using two types of ESD protection:

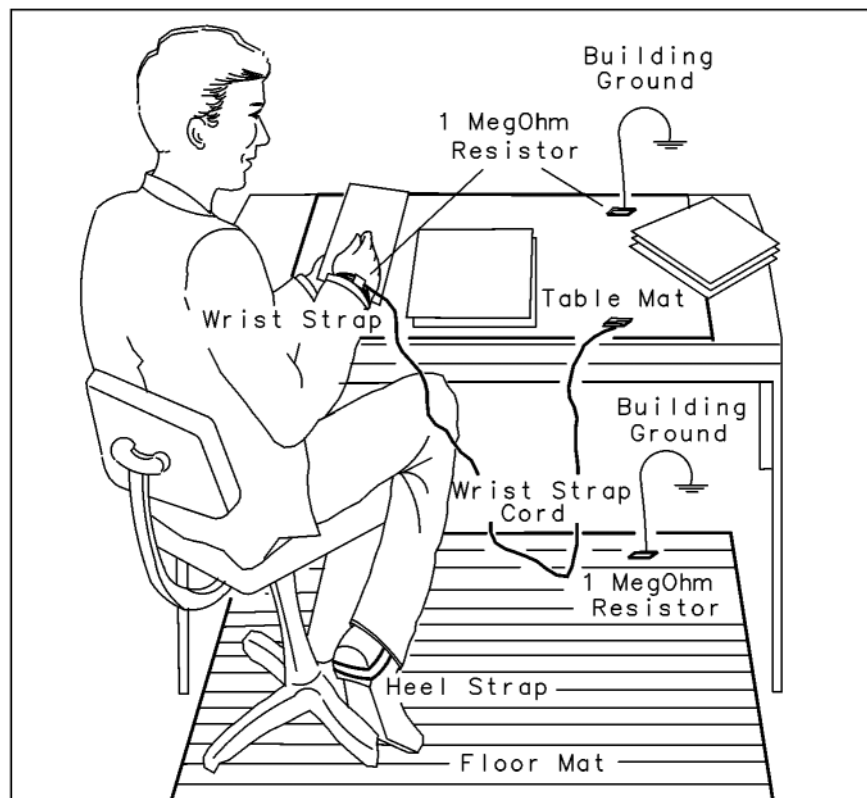
- Conductive table-mat and wrist-strap combination.
- Conductive floor-mat and heel-strap combination.

Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 megohm of isolation from ground.

#### **WARNING**

These techniques for a static-safe workstation should not be used when working on circuitry with a voltage potential greater than 500 volts.

Figure 1 Example of a Static-Safe Workstation



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## ESD Information

### Handling of Electronic Components and ESD

The possibility of unseen damage caused by ESD is present whenever components are transported, stored, or used. The risk of ESD damage can be greatly reduced by paying close attention to how all components are handled.

- Perform work on all components 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.

#### **CAUTION**

**Always handle printed circuit board assemblies by the edges. This will reduce the possibility of ESD damage to components and prevent contamination of exposed plating.**

---

### For Additional Information about ESD

For more information about preventing ESD damage, contact the Electrical Over Stress/Electrostatic Discharge (EOS/ESD) Association, Inc. The ESD standards developed by this agency are sanctioned by the American National Standards Institute (ANSI).

## Overview

The Keysight U9361C/F/G/M Receiver Calibrator is a palm sized USB reference signal source that is used to calibrate and improve the accuracy of products and systems for which the U9361C/F/G/M is a Keysight-approved accessory.

With emphasis on ease-of-use, the embedded features of the calibrator will automatically transfer calibration data from the calibrator memory to the signal analyzer through the USB plug-and-play feature. The analyzer will also auto-detect the model, serial number, and options present on the calibrator.

### Keysight Products Supported

- N9020B<sup>1</sup>/21B MXA Signal Analyzer
- N9030B/32B PXA Signal Analyzer
- N9040B/41B/42B UXA Signal Analyzer

## Unpack, Inspect and Verify Box Contents

### Initial Inspection

Inspect the shipping container and the cushioning material for signs of stress. Retain the shipping materials for future use, as you may wish to ship the instrument to another location or to Keysight Technologies for service.

**Figure 2**                      **Shipping Case**



1. Requires option DP2, MPB, or B40.

## Unpack, Inspect and Verify Box Contents

To access the cables located on the bottom level, remove the top cushion that holds the instrument and wrench by lifting up on the corner cutouts provided.

Table 1 Standard Shipped Items

Item	Description
Startup Guide	Provides instructions on usage, safety, troubleshooting, specifications, and general information.
Certificate of calibration	Provides information regarding the instrument calibration.
Shipping Case	Case-Plastic Rcal
Wrench	Torque 8lb-in, 5/16 Inch (U9361F) or, Torque Special Double-end 14mm-open end 4 and 10-in-lb (U9361M)
USB Cable	Cable-Assembly USB 3.0 Type-A Plug to Type-C Plug, 1 meter long
Coaxial Cable	Cable Assembly-Coaxial BNC Male to SMB-Female, 1 meter long

### 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 calibrator to Keysight Technologies, use the original (or comparable) shipping materials. See **“Returning a U9361C/F/G/M Receiver Calibrator for Service” on page 34.**



## Calibrators Covered by This Guide

- U9361C: 10 MHz to 26.5 GHz Receiver Calibrator, 3.5 mm RF out connector
- U9361F: 10 MHz to 50 GHz Receiver Calibrator, 2.4 mm RF out connector
- U9361G: 10 MHz to 67 GHz Receiver Calibrator, 1.85 mm RF out connector
- U9361M: 10 MHz to 110 GHz Receiver Calibrator, 1.0 mm RF out connector

Figure 2

Calibrator Front View

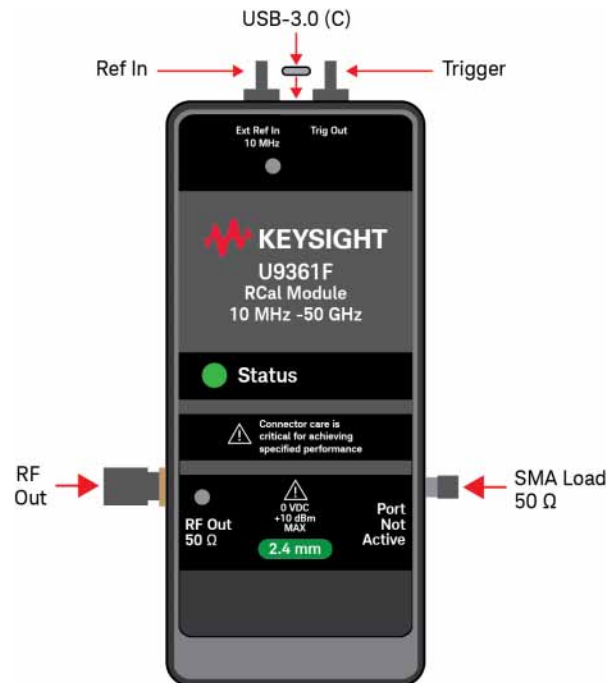
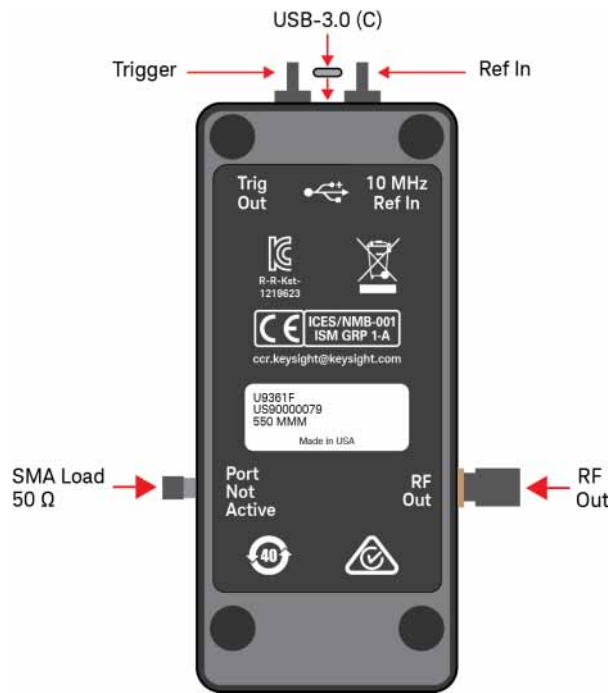


Figure 3 Calibrator Rear View



## Operation

### Operating Precautions

**WARNING**

Do not exceed the maximum ratings listed below or permanent damage to the calibrator will result.

---

#### Electrostatic discharge

When connecting the U9361C/F/G/M USB cable, always connect the USB-A end of the cable to the receiver (signal analyzer) BEFORE connecting the USB-C end of the cable to the calibrator unit.

#### Avoiding calibrator RF connector damage

See “[Connector Care](#)” on page 24.

### Warnings and Cautions

**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.

---

**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**

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

---

**CAUTION**

Safety of any system incorporating the equipment is the responsibility of the assembler of the system.

---

## Operation

### Instrument Information

#### Environmental Conditions

The U9361C/F/G/M Receiver Calibrator is designed for indoor use and in an area with low condensation. The table below shows the general environmental requirements for this instrument.

Environmental Condition	Requirement
Temperature	Operating condition, 0 °C to 55 °C Storage condition, -40 °C to 70 °C
Maximum Relative Humidity (non-condensing)	Operating condition 95% RH up to 40 °C, decreases linearly to 45% RH at 55 °C  From 40 °C to 55 °C, the maximum % Relative Humidity follows the line of constant dew point.
Altitude	Operating condition, < 4600 meters (15,000 feet) Storage condition, < 4600 meters (15,000 feet)

#### Environmental Information

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.

#### Regulatory Information

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.

The U9361C/F/G/M Receiver Calibrator complies with the following Electromagnetic Compatibility (EMC) compliances:

#### EMC Compliance

Complies with the essential requirements of the European EMC Directive and the UK Electromagnetic Compatibility Regulations 2016 as well as current editions of the following standards (dates and editions are cited in the Declaration of Conformity):

- IEC/EN 61326-1
- CISPR Pub 11 Group 1, Class A
- AS/NZS CISPR 11
- ICES/NMB-001

This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.

**NOTE**

The product may have some performance loss that may cause the signal to dropout or lose communication when exposed to ESD events when tested per IEC 61000-4-2.

**South Korean Class A EMC declaration**

This equipment has been conformity assessed for use in business environments. In a residential environment this equipment may cause radio interference.








※ This EMC statement applies to the equipment only for use in business environment.

사용자 안내문
이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

※ 사용자 안내문은 "업무용 방송통신기자재"에만 적용한다.

## Regulatory Markings

The table below lists the definitions of markings that may be on or with the product.

	The CE marking is a registered trademark of the European Community. It indicates that the product complies with all relevant directives.
	The UK conformity mark is a UK government owned mark. Products showing this mark comply with all applicable UK regulations.
	ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.  ISM GRP 1-A Class A indicates that this is an Industrial Scientific and Medical Group 1 Class A product.
<a href="mailto:ccr.keysight@keysight.com">ccr.keysight@keysight.com</a>	The Keysight email address is required by EU directives applicable to our product.
	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.
	The RCM mark is a registered trademark of the Australian Communications and Media Authority.
	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 <a href="http://www.keysight.com/go/takeback">www.keysight.com/go/takeback</a> to understand your trade-in options with Keysight, in addition to product takeback instructions.
 R-R-Kst-1219623	South Korean Certification (KC) mark. It includes the marking's identifier code in the format shown.

## Safety

Complies with the following standard (dates and editions are cited in the Declaration of Conformity): IEC/EN 61010-1.

## Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This instrument complies with the WEEE Directive (2002/96/EC) marking requirement. This affixed product label indicates that you must not discard this electrical or electronic product in domestic household waste.

## Product Category

With reference to the equipment types in the WEEE directive Annex 1, this instrument is classified as a “Monitoring and Control Instrument” product.

The affixed product label is as shown below.



Do not dispose in domestic household waste.

To return this unwanted instrument, contact your nearest Keysight Service Center, or visit <http://about.keysight.com/en/companyinfo/environment/takeback.shtml> for more information.

## Setup Procedure

### NOTE

During a calibration process, the calibrator, the product being calibrated, or its associated connections, should not be touched or disturbed. ESD could cause signal to drop out or lose communication.

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1. Verify host analyzer has software revision A.30.08 or later. On the analyzer press **System, Show System**. If an instrument software update is required, the latest revision of the X-Series signal analyzer software may be downloaded from:

[http://www.keysight.com/find/xseries\\_software](http://www.keysight.com/find/xseries_software)

2. Locate USB cable and Option Upgrade Entitlement Certificate.
3. Verify Option U9361Y\_RCL

The signal analyzer (host) must already have option U9361Y\_RCL installed, or the Option Upgrade Entitlement Certificate supplied can be redeemed to install option RCL. To verify that option RCL is installed on the signal analyzer select the **System > Show System**, and scroll to the bottom of the options listing and look for U9361Y\_RCL.

4. Connect the Module to the Signal Analyzer

Using the USB cable supplied, connect the module to one of the rear panel blue color USB 3 ports. The front panel USB port marked with the lightning bolt can also be used, however the other two front panel USB ports have insufficient power and cannot be used.

The message **Updating Hardware Configuration** will appear on screen, and several LEDs on the module will blink. Then the message **USB RCal Connected** will appear on screen.

5. Module Warm-up Time

The Status LED on the module will blink Amber until the module reaches <sup>1</sup>temperature stability, and then the LED status indicator will turn Green. See **Figure 2**.

It is recommended that the Receiver Calibrator's Ext Ref IN be connected to either:

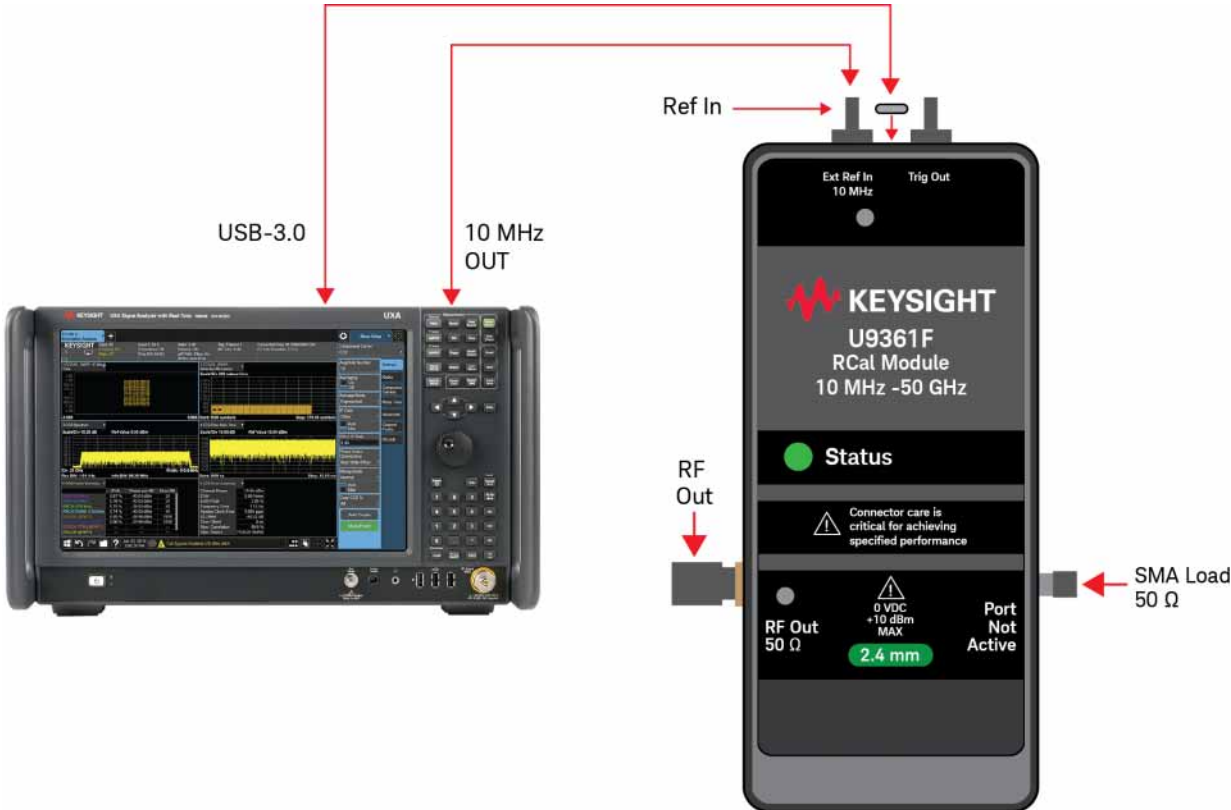
- The 10MHz Reference OUT port of the Spectrum Analyzer that is controlling the RCAL unit, or,
- The 10MHz Reference OUT port of an instrument that is locked to the 10MHz Reference OUT of the Spectrum Analyzer that is controlling the RCAL unit.

---

1. Warm-up time is ~10min (varies with previous conditions: cold start, previously powered-on, etc.)



Figure 4 Typical Setup Configuration



## LED Definition

## LED Definition

The Receiver Calibrator has three LEDs; Status, RF Out and 10 MHz Ref, that signal the state of the calibrator. See chart below for information on how to interpret the LEDs.

**Table 4-1 Troubleshooting procedure**

<b>RCal State</b>	<b>Status</b>	<b>RF Out</b>	<b>10MHz Ref</b>
No USB connection	OFF	OFF	OFF
Led Turn-on Test	Red, Blue, Green test seq	Red, Blue, Green test seq	Red, Blue, Green test seq
Processor communicating/busy	Green, slow pulse	-	-
USB Power Negotiation Failed	Red	Red - fast pulse	-
Processor Error Message	Red - fast pulse	OFF	OFF
Temperature unstable	Amber - slow pulse	-	-
Temperature stable	Green	-	-
RF Output Off	-	OFF	-
RF Output On	-	Green	-
Internal Reference in use	-	-	OFF
10 MHz external reference in use, locked	-	-	Green
10 MHz external reference requested, unlocked	-	-	Red - Fast pulse
Identify Device Function	Blue - fast pulse	-	-

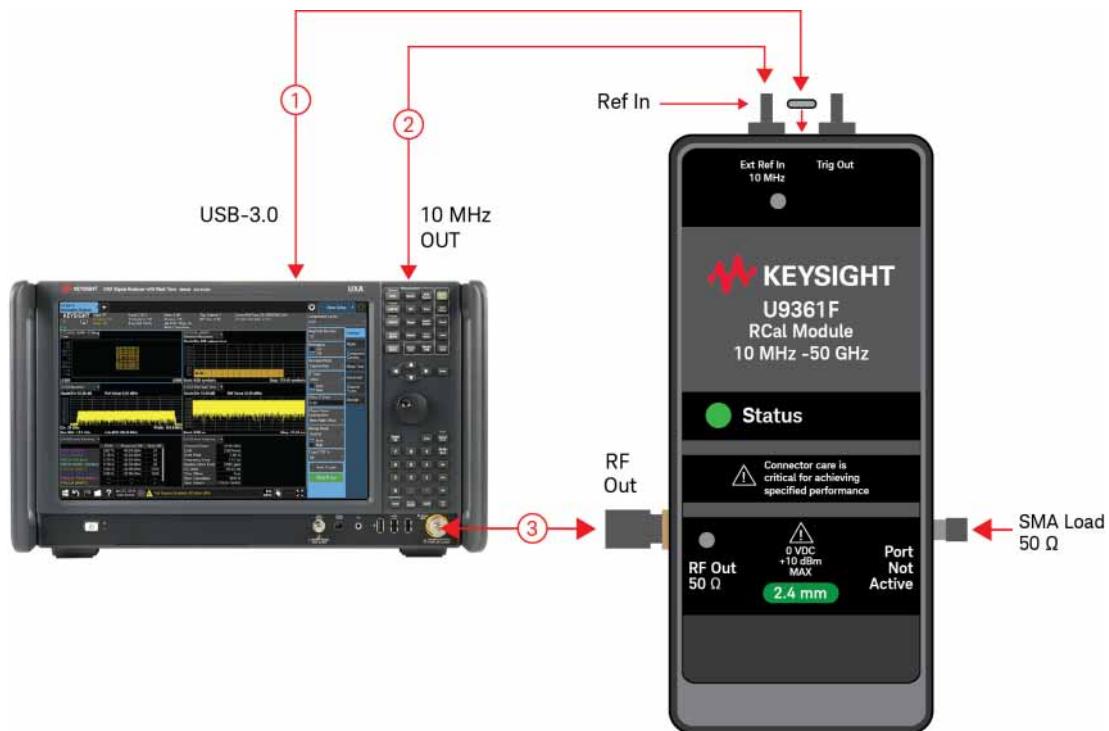
## Example: RCal Calibration Using a UXA Signal Analyzer

### NOTE

The calibration procedure detailed below is specific to using a U9361 RCal with a UXA signal analyzer. Since the RCal is designed to use in various configurations it is important for the user to refer to their specific instrument calibration documentation for detailed requirements regarding adapters, cables, settings, and procedure.

This procedure serves as a functional test that details the steps involved in the X-Series software to perform a basic user calibration. This procedure does not test performance, nor does it address all features and capabilities for the U9361 RCal, but rather serves as a basic functional test and tutorial when setting up the RCal unit.

Connect the U9361C/F/G/M to the signal analyzer using the configuration shown in below:

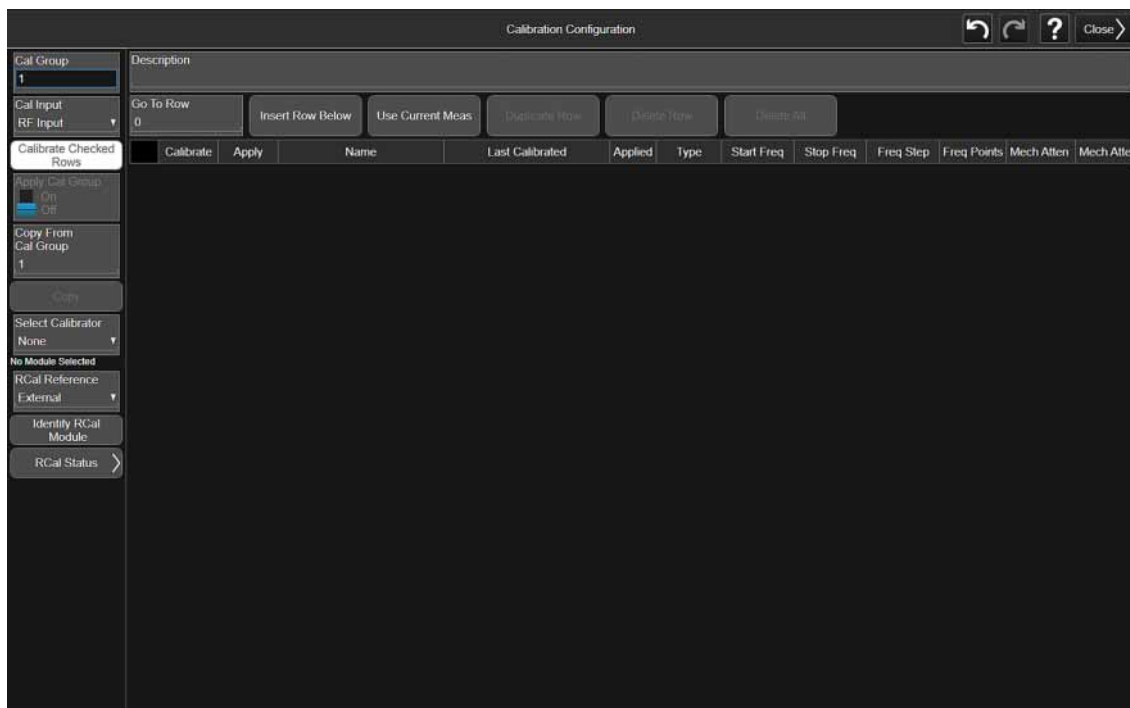


Item Number	Description	Connections
1	USB Cable, Type A to Type C	From UXA USB3.0 port to RCal USB Type C port
2	BNC Male to SMB Female coax cable	From UXA 10MHz Reference Output port to RCal EXT REF IN 10 MHz port
3	Coax Cable (user supplied) <sup>a</sup>	From UXA RF IN port (low frequency port if using N9041B) to RCal Out Port

- a. Adapters and cables necessary may vary depending on the RCal options, as well as the frequency ranges of the analyzer used.

## Procedure

1. On the analyzer select **Mode/Meas > Spectrum Analyzer Mode > Swept SA Measurement**. Then, press **Mode Preset**.
2. Select: **Input/Output > Calibration > Configuration**. This should bring up the RCal Configuration table:



3. Press **Select Calibrator**, and replace **None** with **RCal Module 1**.  
The model number and serial number should now be displayed below the Calibrator option. These numbers should match the numbers physically on the device.

**NOTE** If RCal Module 1 does not show up as an option, disconnect and reconnect the USB cable.

4. Press **Use Current Meas** to bring up a row in the table.
5. In the row, select:
  - Start Freq > 1 GHz**
  - Stop Freq > 3 GHz**

The table should now appear as shown below:

Name	Last Calibrated	Applied	Type	Start Freq	Stop Freq	Freq Step	Freq Points	Mech Atten	Mech Atten Start	Mech Atten Stop	Mech Atten Step	Elec Atten	Elec Atten Start	Elec Atten Stop	Elec Atten Step
Magnitude	1.000000000 GHz	3.000000000 GHz	200.0000000 MHz	11 Step	10 dB	10 dB	2 dB	Bypass	0 dB	0 dB	1 dB				

By using the scroll bar below the row, you can view the right side of the table:

Name	Type
Magnitude	Magnitude

Freq Step	Freq Points	Mech Atten	Mech Atten Start	Mech Atten Stop	Mech Atten Step	Elec Atten	Elec Atten Start	Elec Atten Stop	Elec Atten Step
1 Hz	200.0000000 MHz	11 Step	10 dB	10 dB	2 dB	Bypass	0 dB	0 dB	1 dB

Calibrate	Apply	Name	Last Calibrated	Applied	Type	Start Freq	Stop Freq	Freq Step
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Magnitude	2/25/2021 1:05:49 PM		Magnitude	1.000000000 GHz	3.000000000 GHz	200.0000000 MHz

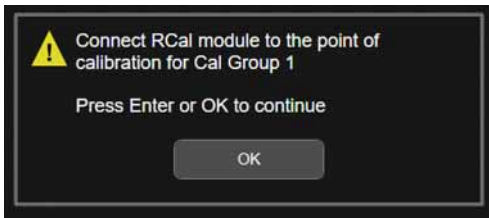
**NOTE**

If the parameters shown in the examples above do not match your configuration, manually adjust the system to match.

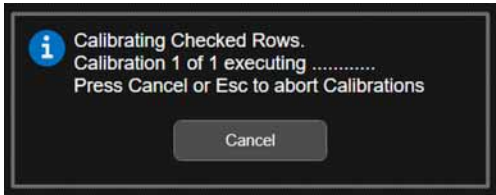
- Confirm that **Calibrate** is checked as shown in the image above.

Example: RCal Calibration Using a UXA Signal Analyzer

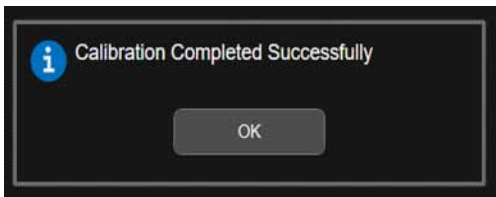
7. Press the **Calibrate Checked Rows** button. You should see the following message:



With the RCal module connected to the signal path, press **OK** to start the calibration:

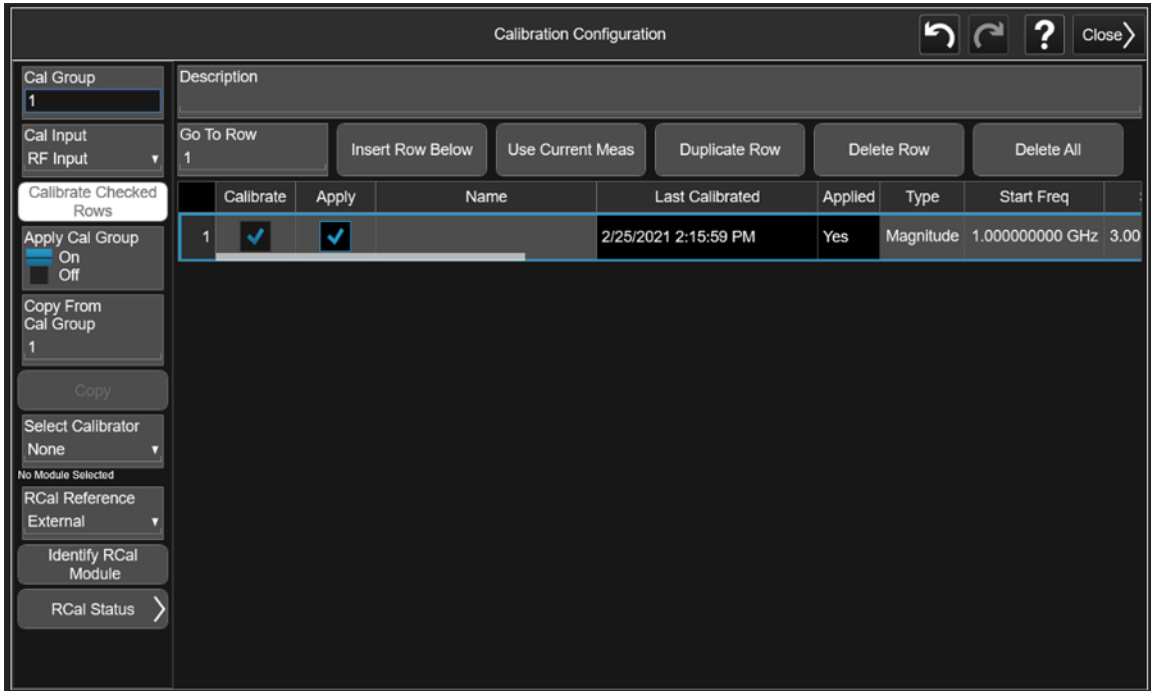


When the calibration completes, you should (briefly) see the message below:

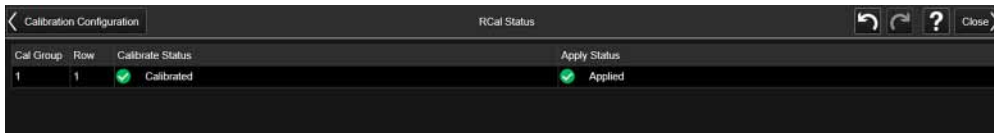


The table column "Last Calibrated" should show a time stamp for the successful calibration.

8. To apply the correction, check the “Apply” column in the row. The table should appear as:



The “Applied” column should show “Yes”, indicating that the selected calibration is being applied. For more detailed information, press the **RCal Status** button to bring up the status page:



The status for this Cal Group and Row is Calibration Status “Calibrated” and Apply Status “Applied”, indicating that the calibration was successful and the cal has been applied to the measurement state. Press **Close** to return to the swept analyzer display.

This completes a basic magnitude calibration from 1 GHz to 3 GHz using the RCal module.

## Care and Maintenance

### **WARNING**

Disconnect the Keysight U9361C/F/G/M from USB power before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally.

---

### **CAUTION**

The U9361C/F/G/M receiver calibrator is not field-repairable, and requires return to Keysight for both repair and calibration. Do not attempt to open the instrument enclosure.

---

## Connector Care

### Visual Inspection

Visual inspection and, if necessary, cleaning should be done every time a connection is made. Metal particles from connector threads may fall into the connector when it is disconnected. One connection made with a dirty or damaged connector can damage both connectors beyond repair.

Magnification is helpful when inspecting connectors, but it is not required and may actually be misleading. Defects and damage that cannot be seen without magnification generally have no effect on electrical or mechanical performance. Magnification is of great use in analyzing the nature and cause of damage and in cleaning connectors, but it is not required for inspection.

### Obvious defects or damage

Examine the connectors first for obvious defects or damage:

#### **Plating**

- Bare metal showing
- Burrs or blisters

#### **Deformed threads**

#### **Center conductors**

- Bent
- Broken
- Misaligned
- Concentricity

#### **Connector nuts should move smoothly and be free of:**

- Burrs
- Loose metal particles
- Rough spots

Any connector that has obvious defects should be replaced.



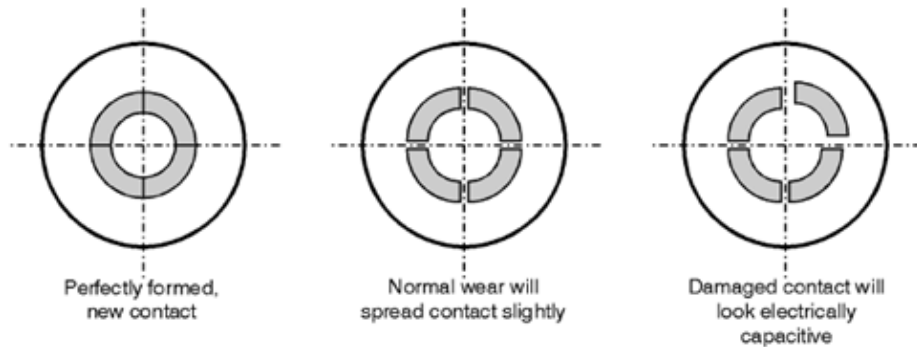
### Connector Contacts

Inspect the connector contacts for integrity. It is necessary to use good lighting (such as a halogen task light) to see the contacts.

Notice the location of the cross hairs in relationship to the center of the figures.

### Contact Integrity

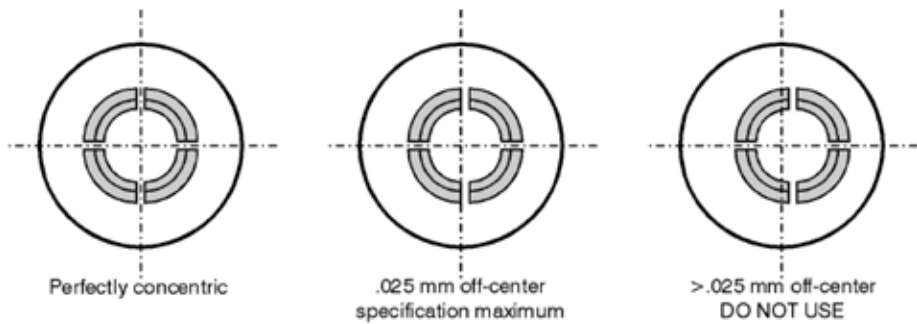
Refer to the following for visual guidelines when evaluating the contact integrity of a connector.



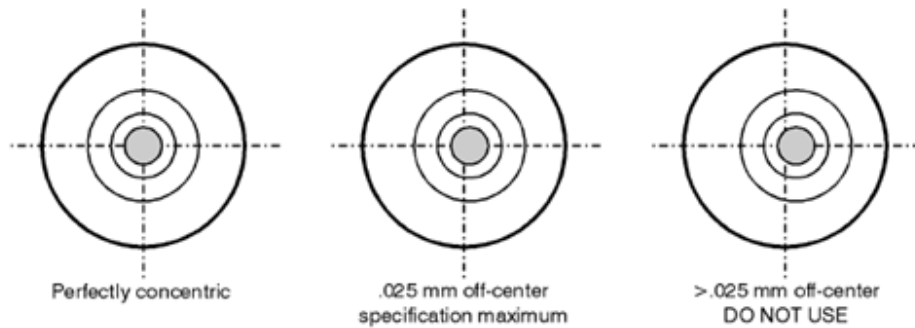
### Concentricity

The following examples show the concentricity of both the male and female 1.0 mm connectors:

Female connector:



Male Connector:



### Making Connections

Good connections require a skilled operator. Instrument sensitivity and coaxial connector mechanical tolerances are such that slight errors in operator technique can have a significant effect on measurements and measurement uncertainties.

#### NOTE

The most common cause of measurement error is poor connections.

1. Ground yourself and all devices (wear a grounded wrist strap and work on an antistatic mat).
2. Visually inspect the connectors (refer to Visual Inspection).
3. If necessary, clean the connectors (refer to Cleaning Connectors).
4. Carefully align the connectors. The male connector center pin must slip concentrically into the contact fingers of the female connector.
5. Push the connectors straight together. Do not twist or screw them together. As the center conductors mate, there is usually a slight resistance.

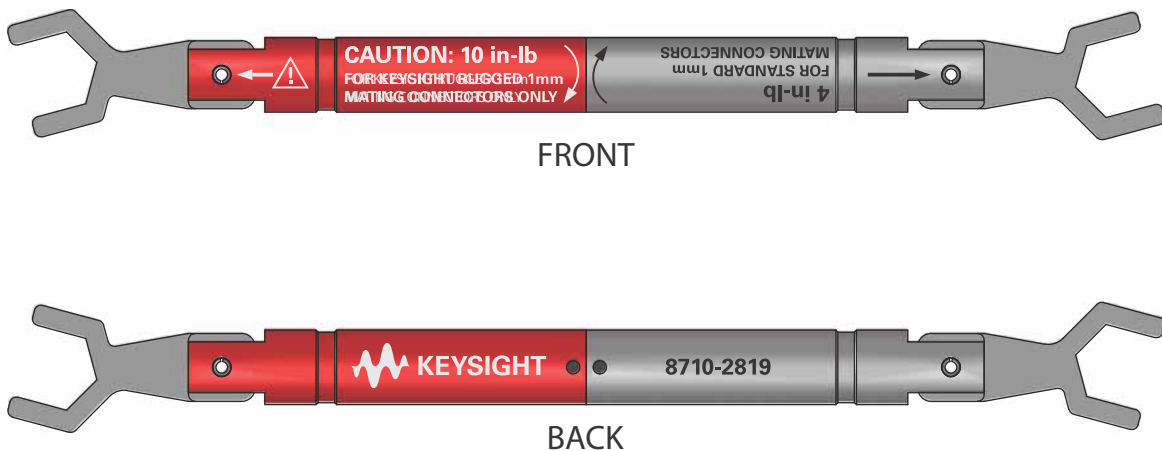
#### CAUTION

Do not twist one connector into the other (like inserting a light bulb). This happens when you turn the device body, rather than the connector nut. Major damage to the center conductor and the outer conductor can occur if the device body is twisted.

### Connection Procedure

Familiarize yourself with the proper use of the double-ended torque wrench shown in Figure 5 below. To prevent expensive repairs and repair downtime, take a few minutes to study the information in the following pages.

Figure 5 Dual Torque wrench, 14 mm open end, 4 lb-in (0.45 Nm) and 10 lb-in (1.13 Nm), Part Number 8710-2819



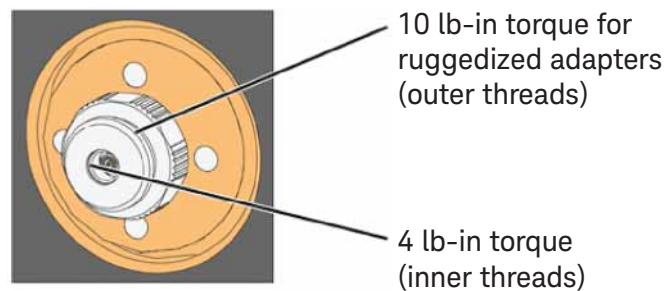
### Test Port Connector

Figure 6 shows the torque specification for the two connection threads on the U9361M output port connector.

#### CAUTION

Two wrenches must be used to avoid stress on cables.

Figure 6 Torque Specification for Output Port Threads



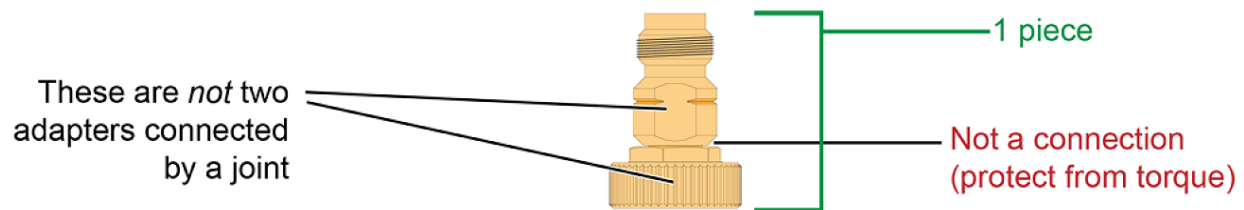
## Output Port Adapters

Ruggedized adapter:

- 1 mm to 1.00 mm Y1900B/C/D adapter

This adapter can be connected to the U9361M output port. Due to the physical requirements needed to obtain high performance, the geometry of these, as well as all, 1 mm connectors, demands special care to avoid expensive damage as explained in this document.

Figure 7 Ruggedized Adapter



## Making RF Connections

1. Work at a static-safe workstation.
2. Visually inspect the connectors. If necessary, clean the connectors. Carefully align the connectors. The male connector center pin must slip concentrically into the contact fingers of the female connector.
3. Push the connectors straight together.
4. Tighten lightly using only your fingers as, at this point, all you want is a connection in which the outer conductors make gentle contact at all points on both mating surfaces. Very light finger pressure (no more than 2 pound-inches of torque) is enough.

### CAUTION

Do not twist one connector into the other (like inserting a light bulb). This happens if you turn the device body rather than the connector nut. Major damage to the center conductor can occur if the device body is twisted.

5. Use a torque wrench to make the final connection. This guarantees perfectly tight, consistent connections that prevents connector damage.
  - See [Figure 8](#) for the proper handling of the wrench.
  - To view the correct connector “flats” on which to position the wrench:
    - See [Figure 9](#) and [Figure 10](#) for Test Port connectors.

### CAUTION

The maximum torque setting is 4 in-lb (0.45 Nm) for non-ruggedized 1.0 mm connectors.

### CAUTION

Rotate only the connector nut when you make the connection. Do not rotate the cable or adapter.

**CAUTION**

Hold the torque wrench lightly at the groove located at the end of the handle.

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**CAUTION**

Apply force perpendicular to the wrench handle. This applies torque to the connection through the wrench. Do not hold the wrench so tightly that you push the handle straight down along its length rather than pivoting it, otherwise you apply an unlimited amount of torque.

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**CAUTION**

Tighten the connection just to the torque wrench "break" point as shown in **Figure 8**. Do not tighten the connection further.

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### Applying Torque

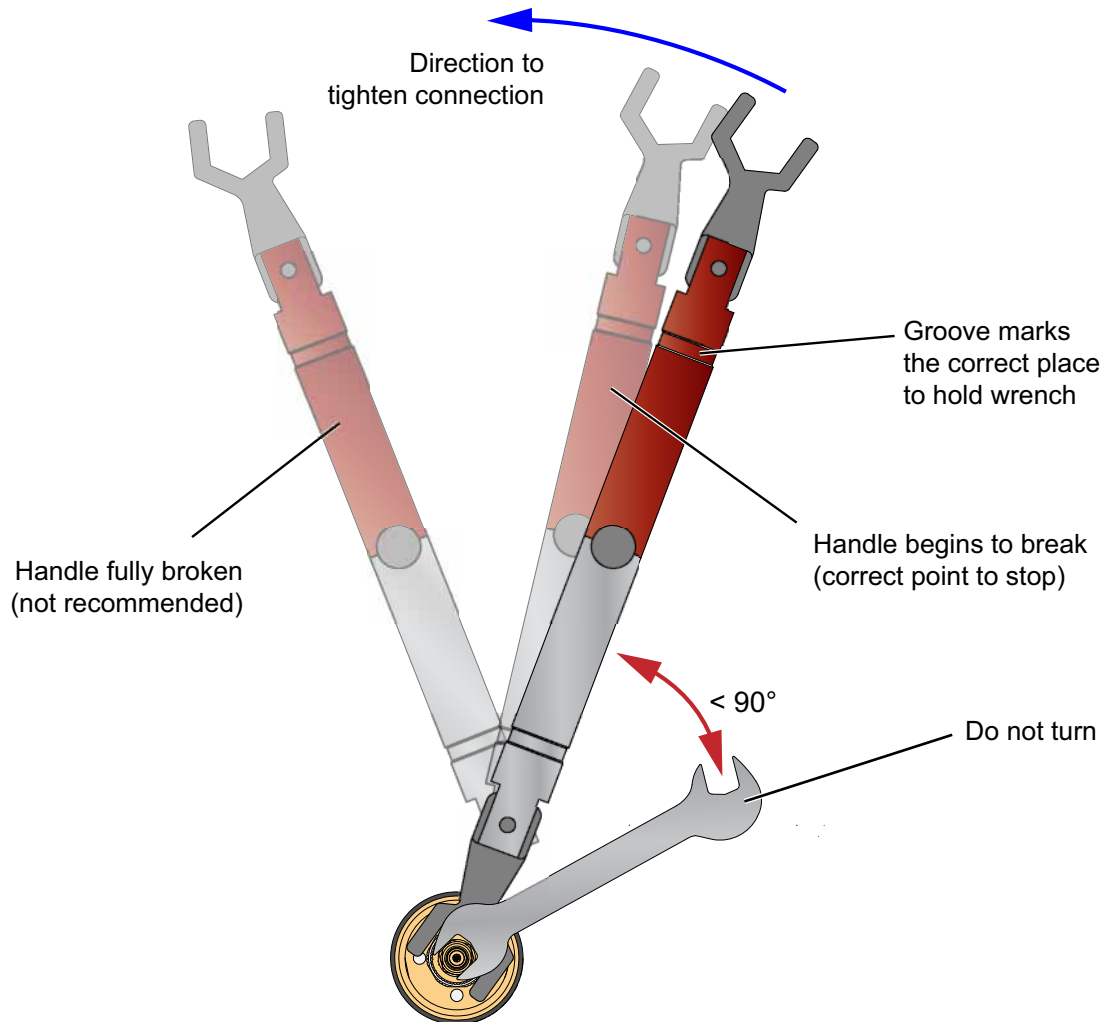
For the 1 mm Output Port connector, use the dual torque wrench. For matching non-ruggedized connectors using the inner threads, to the U9361M, use the 4 lb-in torque wrench.

**CAUTION**

Two wrenches must be used to avoid stress on semi-rigid cables.

Figure 8

Wrenches on Test Port



**CAUTION**

The silver end of the dual torque wrench is 4 lb-in. The red end of the torque wrench is 10 lb-in.

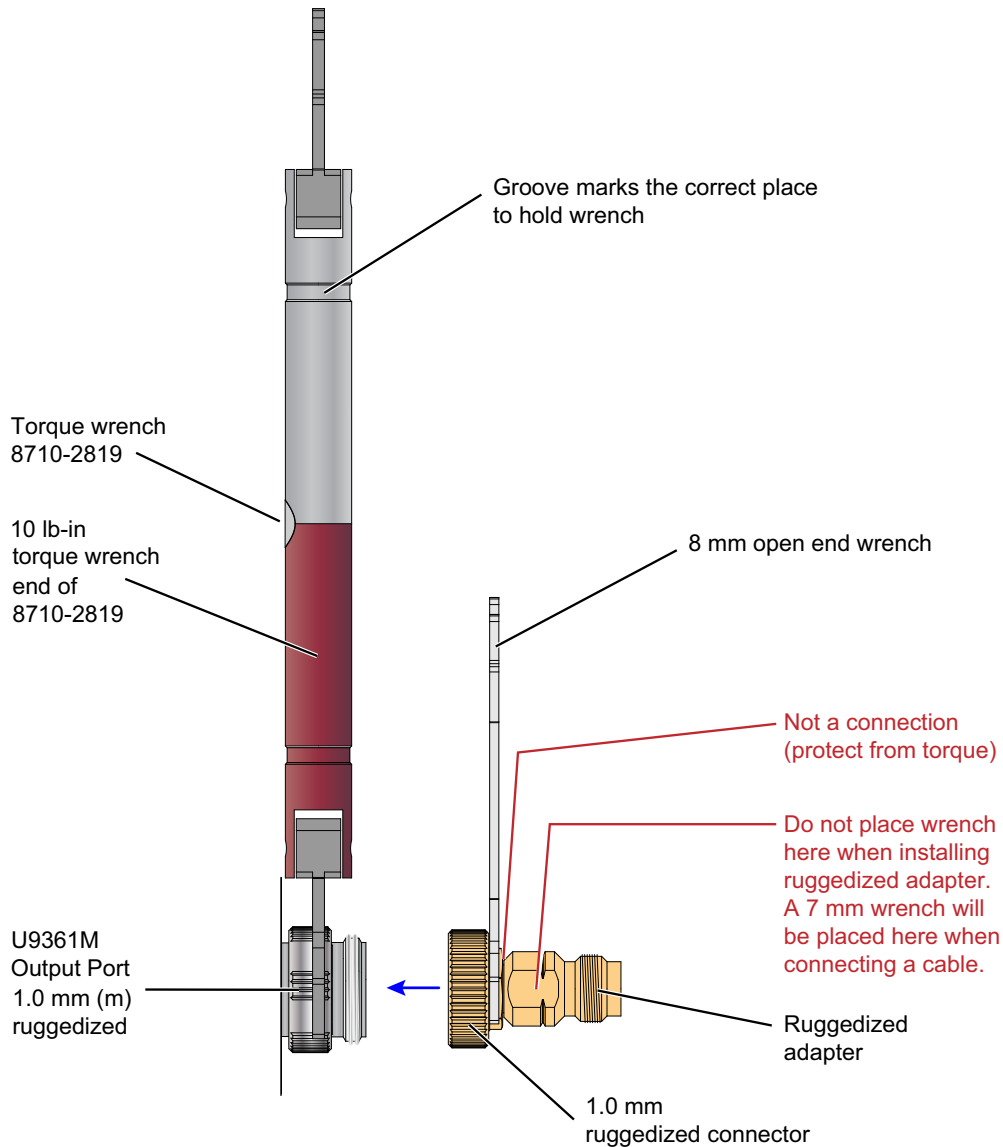
### Selecting and Positioning the Wrenches

For a few possible connections, the following figures show the proper “flats” on which to place the wrench.

#### Ruggedized Adapter to 1 mm Output Port

Figure 9 shows the correct placement of the 10 lb-in torque wrench (the red end) and the 8 mm open end wrench. On the ruggedized adapter, connect the 8 mm wrench on the flats that are adjacent to the knurled ring.

Figure 9 Wrenches Positioned on Correct Flats



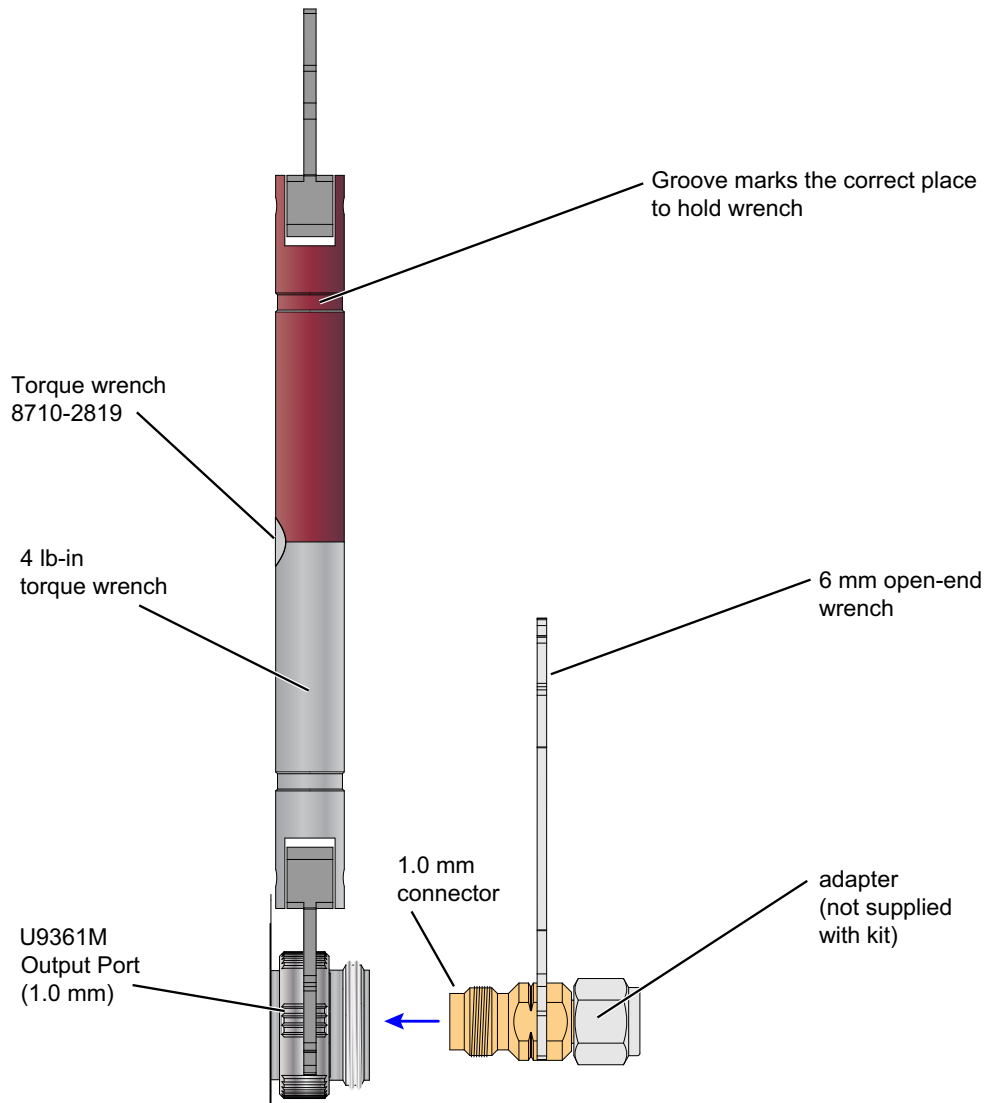
To connect a cable, or device, to the ruggedized test port adapter, use a 7 mm open end wrench to hold the test port adapter stationary. For a 2.4 mm cable or device, use a 5/16 inch torque wrench to torque the cable or device to 8 inch-pounds (0.90 N-m). For a 1 mm cable or device, use a 6 mm torque wrench to torque the cable or device to 4 inch pounds (0.45 N-m).

### Adapter to 1 mm Output Port (without ruggedized adapter)

It is recommended that you always connect a ruggedized adapter to the U9361M output port. However, if you want to connect an adapter that uses the inner threads, or cable directly to a test port connector, use the 4 lb-in end of the dual torque wrench (silver end of the dual torque wrench). Do not use the red end of the dual torque wrench which is only used when connecting the stronger outside test port connector threads to the ruggedized adapter.

Never apply in excess of 4 lb-in of torque to the U9361M output port inner threads.

Figure 10 Wrenches Positioned on Correct Flats



To connect a cable or device to the 1 mm adapter, use a 6 mm open end wrench to hold the test port adapter stationary, and torque the cable or device to 4 inch pounds (0.45 N-m). A common 1mm cable connection nut is 6 mm.

For the U9361F, with the 2.4 mm output connection, use the 5/16 inch torque wrench to torque the cable or device to 8 inch-pounds (0.90 N-m).



## Cleaning Connectors

1. Inspect the connectors for dust, dirt, metal fragment, oils or film, and debris.
2. Blow off any dust with a filtered, clean supply of compressed air.
3. Add a few drops of high-purity isopropyl alcohol to a small cleaning swab (do not apply alcohol directly to the parts).

**NOTE**

When using isopropyl alcohol to clean connectors do not allow the liquid to flow down inside the connector. This may cause measurement errors due to residue inside the connector. If possible keep the connector facing down.

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4. Gently wipe connecting surfaces with the end of the cleaning swab.
5. Blow dry with compressed air.
6. Inspect and repeat cleaning procedure if necessary.

## Returning a U9361C/F/G/M Receiver Calibrator for Service

### Contacting Keysight

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

<http://www.keysight.com/find/assist>

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

#### NOTE

**In any correspondence or telephone conversation, refer to the Keysight product by its model number and full serial number. With this information, the Keysight representative can determine the warranty status of your unit.**

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### Shipping your product to Keysight for service or repair

If you wish to send your product to Keysight for service or repair:

- Include a complete description of the service requested or of the failure and a description of any failed test and any error message.
- Remove and retain the front handles and all rack mount hardware. The product should be sent to Keysight in the same configuration as it was originally shipped.
- Ship the product using the original or comparable anti-static packaging materials.
- Contact Keysight for instructions on where to ship your product.



This information is subject to change without notice.

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Edition 1, October 2021

U9361-90001

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