# Keysight X-Series Signal Analyzer 1.0 mm Input Connector Kit

KEYSIGHT

USER'S GUIDE

# Notices



## Trademark Acknowledgments

### Manual Part Number

N9041-90006

### Publication Date

Edition 1: July 2024

Supersedes: February 2022

Published in USA

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# Safety Notices

**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 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:

https://www.keysight.com/find/n9041b

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

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

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

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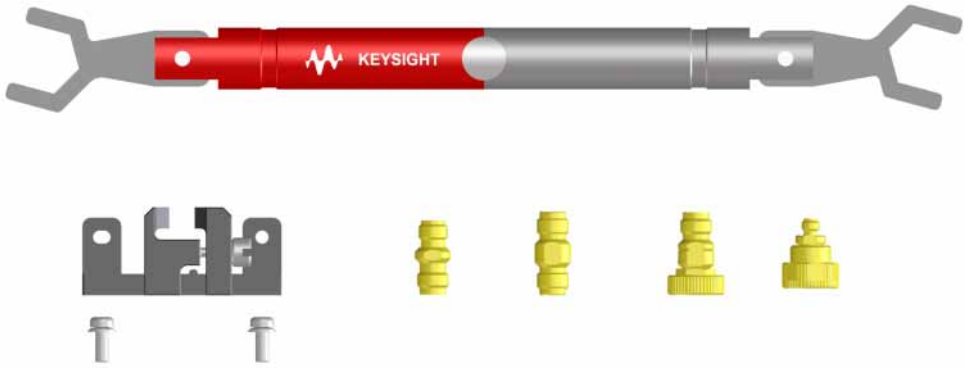
# 1 Keysight Connector Kit

# Connector Kit Overview

This connector kit has been designed for use with Keysight X-Series Signal Analyzers that have a 1.0 mm input connector. It also contains adapters for instruments that have a 2.4 mm input in addition to the 1.0 mm input.

The 1.0 mm input connector on these instruments is a special male Keysight bulk head connector that has 14 mm wrench flats. This test port connector has external threads that accept the Keysight Test port adapters, and has internal threads that will accept Keysight standard 1.0 mm female adapter, such as the 11920B.

The Connector Kit contains the following accessories:




| Part Number | Specification | Description |
|---|---|---|
| 11904-60002 | Adapter - 2.4 mm (f) to 2.92 mm (f) | Used on 2.4 mm RF input as a connector saver to connect 3.5 mm or SMA devices or cables. |
| 85056-60006 | Adapter 2.4 mm (f) - 2.4 mm (f) | Used on 2.4 mm RF input as a connector saver. |
| 5067-1390 | Adapter - 1 mm (f) test port to 1 mm (f) | Used on 1.0 mm RF input as a connector saver. |
| 5067-1392 | Adapter - 1 mm (f) test port to 1.85 mm (f) | Used on 1.0 mm RF input as a connector saver and to connect 1.85 mm devices or cables. |
| 8710-2819 | Torque Wrench | Double ended wrench with 10 inch-pound (setting for test port adapters) and 4 inch-pound (setting for Keysight standard 1.0 mm adapters). |
| N9041-60032 | Connector Vise for 1.0 mm RF Input | If the test port adapters cannot be used, this vise will help secure a Keysight standard 1.0 mm female adapter to the instrument 1.0 mm RF input connector. |

The part numbers shown in the table above are used to identify the contents of the connector kit. Refer to Chapter 2, “Connector Care”, on page 13.

# Use of the Test Port Adapters on 1.0 mm RF Input

Two 1.0 mm test port adapters are supplied in the kit. The 1.0 mm female test port to 1.0 mm female adapter is used as a connector saver to extend the lifespan of the instrument 1.0 mm RF input connector. The other test port adapter is a 1.0 mm female test port to 1.85 mm female adapter. This adapter is also a connector saver.

**CAUTION**

USE CAUTION WHEN INSTALLING ADAPTERS! Rotation of the adapter after the connectors are engaged will damage the input connector on the instrument.

1. Align the test port adapter with the 1.0 mm RF input connector on the instrument and engage the nut of the input connector with the adapter. Fully engage the threads, but do not attempt to fully torque the connection.
2. Locate the torque wrench in the kit.
    a. If connecting the 1.0 mm to 1.0 mm adapter, locate a 12 mm open end wrench.
    b. If connecting the 1.0 mm to 1.85 mm adapter, locate a 8 mm open end wrench.
3. Place the jaws of the open end wrench onto the test port adapter wrench flats, but do not turn this wrench.
4. Place the jaws of the 10-inch-pounds end of the torque wrench onto the instrument 1.0 mm RF input connector. While holding the test port adapter still with the open end wrench, torque the input connector to 10-inch-pounds.

# 1.0 mm Input Connector Vise Assembly

Keysight Technologies recommends the use of the supplied Keysight Technologies test port adapters when using the 1.0 mm input connector. The test port adapters attach to the external threads on the instrument bulkhead input connector.

However, if Keysight Technologies standard adapters will be used instead of the test port adapters, the use of the supplied Connector Vise assembly is recommended to prevent damage to the 1.0 mm input connector due to over torque.

Standard adapters other that those manufactured by Keysight Technologies may not work with the Vise Clamp.

**CAUTION**

**USE CAUTION WHEN INSTALLING ADAPTERS! Rotation of the adapter after the connectors are engaged will damage the input connector on the instrument.**

To use Keysight Technologies standard adapters with the Vise Clamp:

1. Install the Vise Clamp with the two supplied pan-head screws. Tighten the screws to 9 inch-pounds.
2. Loosen the Vise Clamp screw so that the vise jaws clear the body of the standard adapter that is to be used.
3. Align the flats of the 1.0 mm female end of the adapter with the vise jaws and tighten the Vise Clamp screw until the jaws grip the adapter. Loosen the screw slightly to allow the adapter to slide in the jaws.
4. Align the adapter with the 1.0 mm input connector on the instrument and engage the nut of the input connector with the adapter. Fully engage the threads, but do not attempt to fully torque the connection.
5. Re-align the jaws of the vise so they make good contact with the flats on the adapter. Do this by pulling back on the vise jaws while tightening the vise clamp screw. DO NOT OVER TIGHTEN.
6. Tighten the input connector nut to 4 inch-pounds using the 4-inch-pounds end of the 14 mm torque wrench.
7. Re-tighten the vise clamp screw to snugly lock the jaws against the flats of the adapter. DO NOT OVER TIGHTEN.
8. If the standard adapter will remain on the input connector for a long period of time, periodically check the Vise Clamp screw to ensure that it remains snugly tightened.

The Vise Clamp will now protect the input connector from damage when connections are made to the adapter that exceed 4 inch-pounds torque. The Vise Clamp is only a rotation prevention device. It will not protect the input connector against damage from bending due to heavy side to side or up/down loading on the adapter.

## 2.4 mm RF Input Adapter Installation

Align the adapter with the 2.4 mm input connector on the instrument and engage the nut of the input connector with the adapter.

Torque the bulkhead 2.4 mm input connector (with an 8 mm or 5/16" torque wrench) to 8 inch-pounds while holding the adapter with a 7 mm open-end wrench.

Refer to Chapter 2, “Connector Care”, on page 13.

# 2 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
  - Burns 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 discarded.

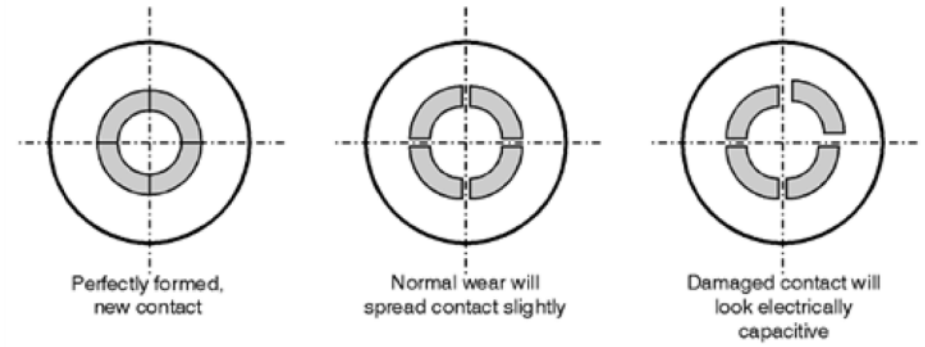
## Connector Contacts

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

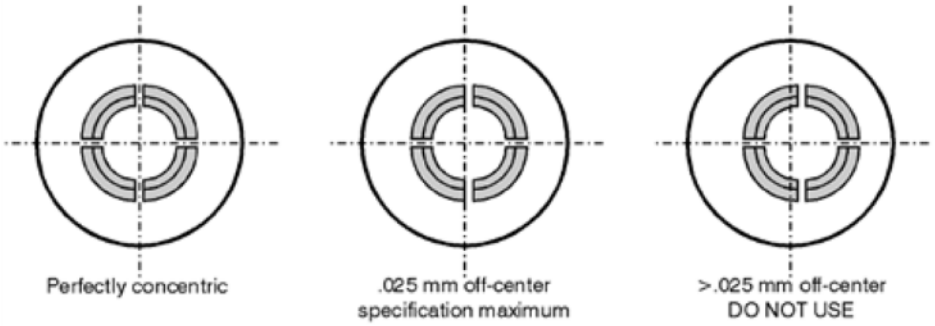
Refer to the following for visual guidelines when evaluating the contact integrity of a connector.



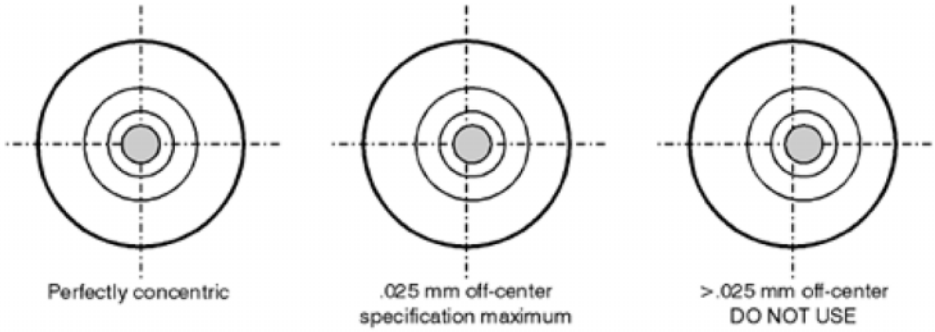

## Concentricity

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.

### Connection Procedure

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.

6. Initial tightening can be done by hand or with an open-end wrench. Tighten until "snug" or where the connectors are first making contact. The preliminary connection is tight enough when the mating plane surfaces make uniform, light contact. **Do not over tighten** this connection. At this point, all you want is for the outer conductors to make gentle contact on both mating surfaces. Use very light finger pressure (no more than 2 inch-pounds of torque).
7. Relieve any side pressure on the connection from long or heavy devices or cables. This assures consistent torque.
8. Torque the cable or device to the final value using a torque wrench.

## 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.

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.

# 3 Replacement Parts

| Description | Ordering Number |
|---|---|
| Test Port Adaptor, 1mm (f) to 1mm (f) | Y1900B |
| Test port Adaptor, 1mm (f) to 1.85mm (f) | Y1901B |
| 2.4 mm (f) to 2.4 mm (f) | 11900B |
| 2.4 mm (f) to 2.92 mm (f) | 11904B |
| Wrench-Torque Special Double-end 14mm-open end 4 and 10-lb-in | 8710-2819 |
| Vise Kit | N9041-60032 |



Edition 1, July 2024

N9041-90006

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