Keysight X-Series Signal Analyzer

N9032B
IQ Streaming
Option ST1 and ST2

KEYSIGHT

INSTALLATION NOTE

Notices

The information contained in this document is subject to change without notice.

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Option ST1 and ST2 – IQ Streaming

Products Affected:	PXA N9032B Option 544/550 all serial prefix Option 508/513/526 serial prefix ≥MY/SG6319
To Be Performed By:	(X) Keysight Service Center ( ) Advanced User ( ) User
Estimated Installation Time:	2.0 Hours
Estimated Adjustment Time:	0.0 Hours
Estimated Verification Time:	1.0 Hours

This document provides detailed instructions for the installation of the IQ Streaming upgrades for the N9032B PXA Signal Analyzer with Option 544/550, or Option 508/513/526, with serial prefix ≥MY/SG6319.

Please be sure to read this entire document before attempting to perform this upgrade. Then, be sure to perform the steps in this procedure in the order that they are listed so that the installation will complete properly, and the instrument will function as desired when completed.

Compatibility

This instrument option requires that the instrument has firmware version A.34.00 or newer. If the instrument being upgraded does not currently meet this requirement the following procedure includes a step to update it.

Instrument Calibration

The validity of any existing calibration that the instrument being upgraded may have will not be affected by the installation of this upgrade.

What you will find in this document

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:

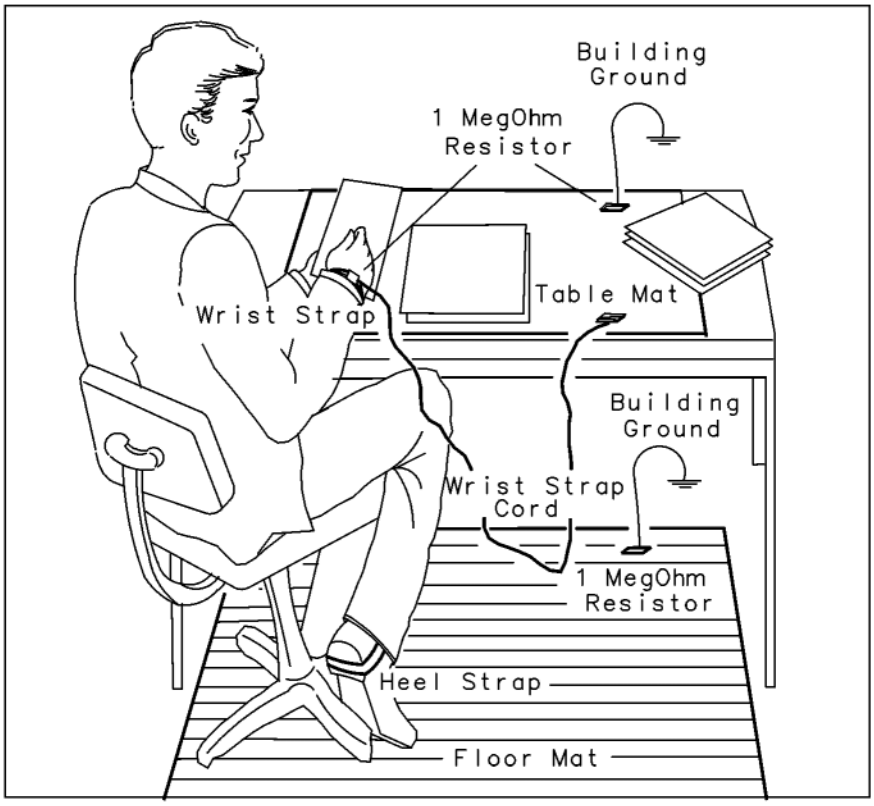
– Conductive table-mat and wrist-strap combination.

– 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



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.

Test Equipment Usage and ESD

- Before connecting any coaxial cable to an analyzer connector, momentarily short the center and outer conductors of the cable together.
- Personnel should be grounded with a 1 megohm resistor-isolated wrist-strap before touching the center pin of any connector and before removing any assembly from the analyzer.
- Be sure that all analyzers are properly earth-grounded to prevent build-up of static charge.

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).

Upgrade Contents

Table 1 Upgrade Contents

Part Number	Description	Quantity
0515-0372	Screw-Machine w/Crest-Cup-Con-Washer Pan-HD Torx-T10 M3X0.5 8mm-LG	2
0515-0666	Screw-Machine w/Crest-Cup-Washer Pan-HD Torx-T10 M3X0.5 18mm-LG	1
0515-1946	Screw-Machine w/Patch Lock 90-DEG-flat-HD Torx-T10 M3X0.5 6mm-LG	18
0515-2332	Screw-Machine w/Patch-Lock Pan-HD Torx-T10 M3X0.5 6mm-LG	4
0515-5208	Screw-Machine w/Patch-Lock Flat-HD Torx-T6 M2X0.4 4mm-LG	1
1005-1388	Fiber Optic Adapter MPO-Shutter Female-Female flange-mount	1
1400-0082	Screw Mount Cable Clamp	4
1400-0249	Nylon Cable Tie	2
1400-1254	Adhesive Cable Clip	2
9030-0000	License Entitlement Certificate	1
M8121-60004	Connector-Fiber Optic Multimode MPO-Loopback	1
M8121-61614	Cable AY, Patch cord, ODI, F-F, 24 fiber, Type C, 3 M lg	1
M9484-80052	Label, FDA Laser	1
N9032-61000	Cable Assembly, Optical FireFly TX/RX	1
N9041-20154	Heatsink, FireFly	1
N9041-20181	Insertion Tool, FireFly	1

Tools Required

- Torx Driver T-10
- Torx Driver T-20
- Multi-Bit Torque Driver
- 5/8” Nut Driver
- 5/16” Wrench

Initial Instrument Functionality Check

Power on the instrument and allow it to complete its boot up process. Verify that there are no instrument messages that would indicate that there is an issue with either the instrument hardware or software. If there are any issues, investigate and fix the problem before continuing with this upgrade.

Instrument Software Revision Check

While the instrument is still powered on check to see what version of the instrument software is installed. To do so press **System**, **Show System** and look on the System Information screen for the **Instrument S/W Revision**. Record the software revision below.

Instrument S/W Revision Installed: _____

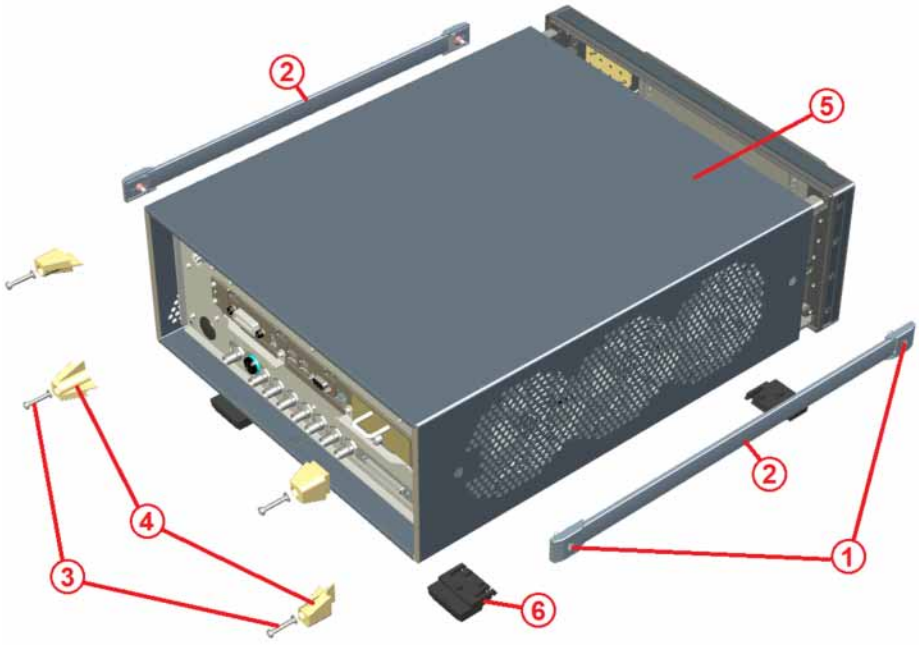
Upgrade Instructions

Hardware Disassembly

Dress Cover Removal

1. Turn the instrument off and disconnect the power cord.
2. Referring to Figure 2, remove the two screws (1) that attach the strap handle (2) from both sides and remove the strap handles.

Figure 2 Dress Cover Removal

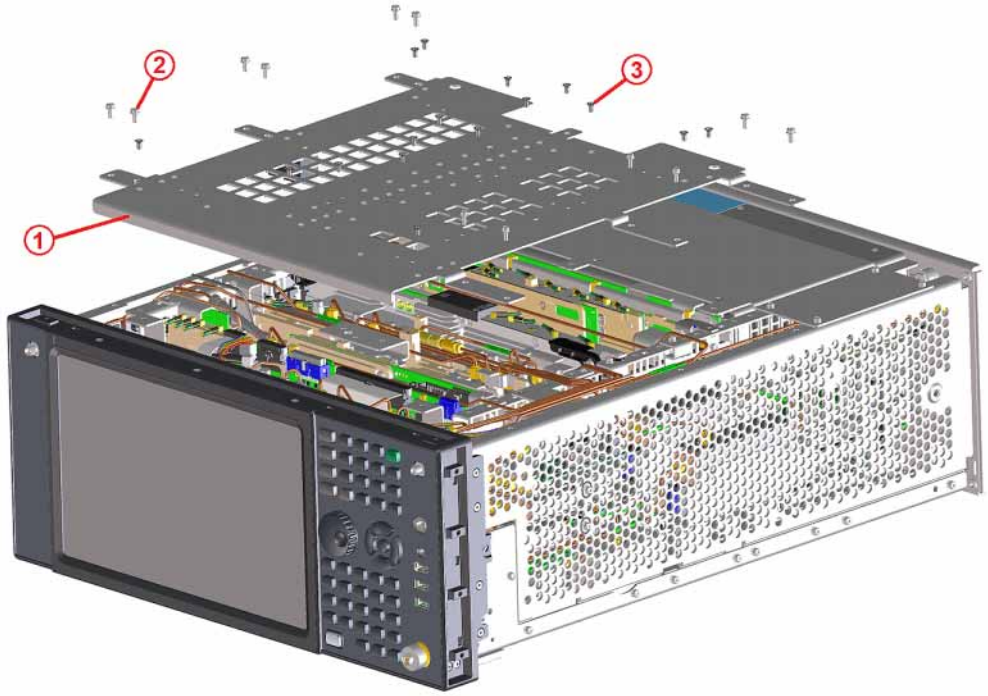


3. Remove the four rear feet (4) by removing the four screws (3) and washers that attach them.
4. Remove the four bottom feet (6) by first removing the locking keys and then lifting the tabs and sliding the foot toward the tabs.
5. Carefully slide the dress cover (5) off the instrument.

Top Brace Removal

6. Referring to Figure 3, remove the sixteen flathead screws (2) and twelve panhead screws (3) attaching the top brace (1) to the instrument and set it aside. The sixteen flathead screws can be discarded, and they will be replaced with new ones.

Figure 3 Remove Top Brace



Blank Plate Removal

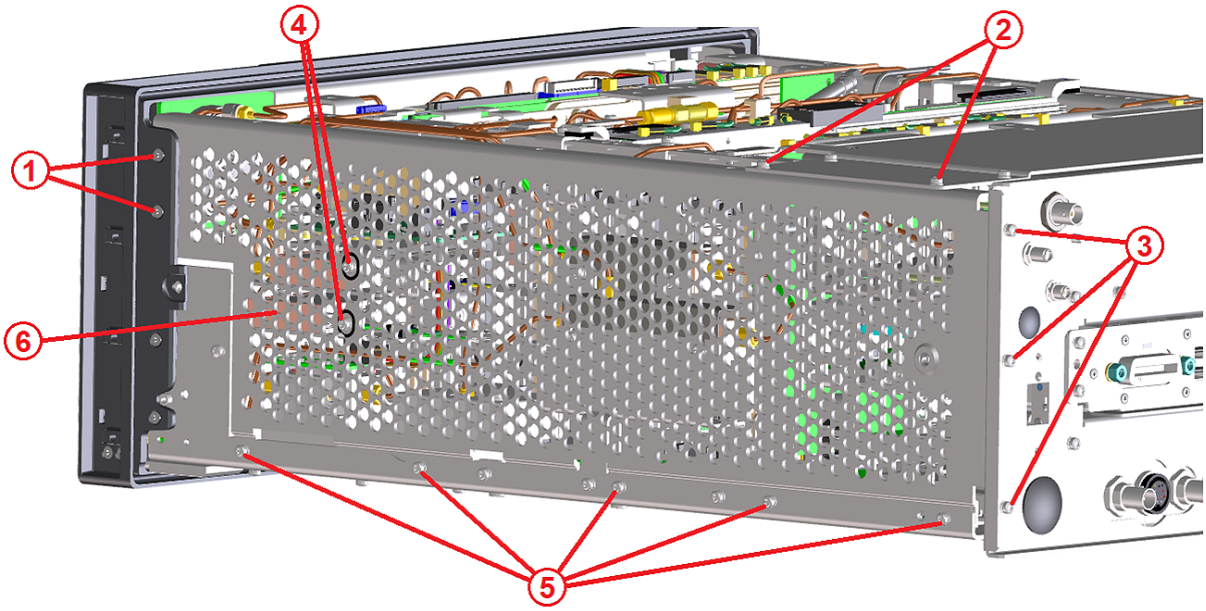
7. Referring to Figure 4, remove the two panhead screws (1) securing the blank plate (2) to the rear panel and discard the plate.

Figure 4 Remove Blank Plate

Side Bracket Removal

8. Referring to Figure 5, remove the two flathead screws (1), the two panhead screws (2), the three panhead screws (3), the two panhead screws (4), and the five panhead screws (5) that attach the side bracket (6) to the instruments. Then remove the side bracket.

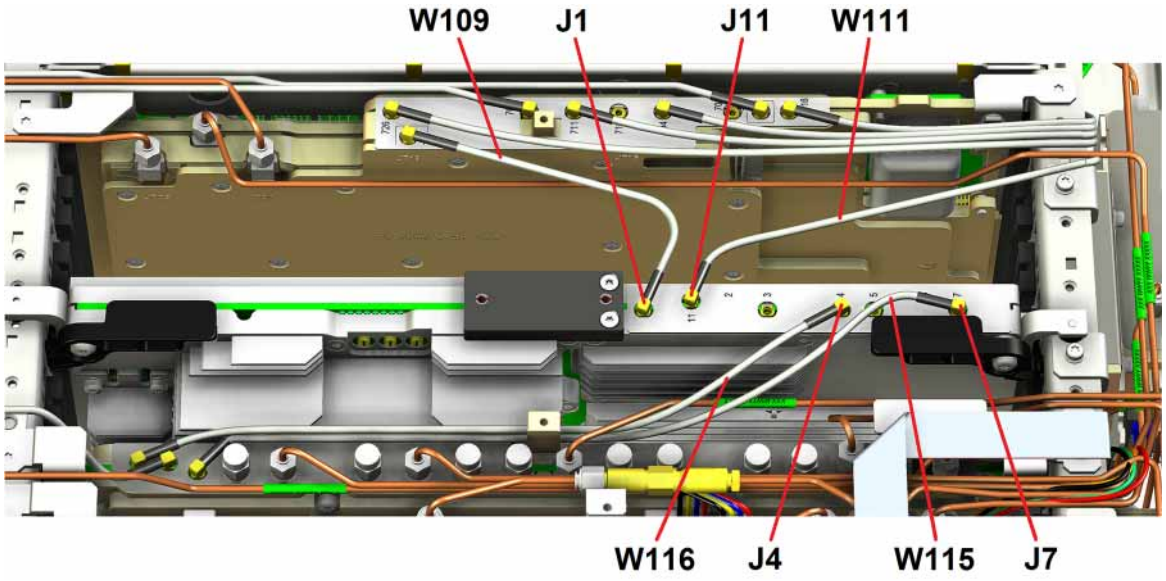
Figure 5 Side Bracket Removal



A21 Wideband Digital IF Removal

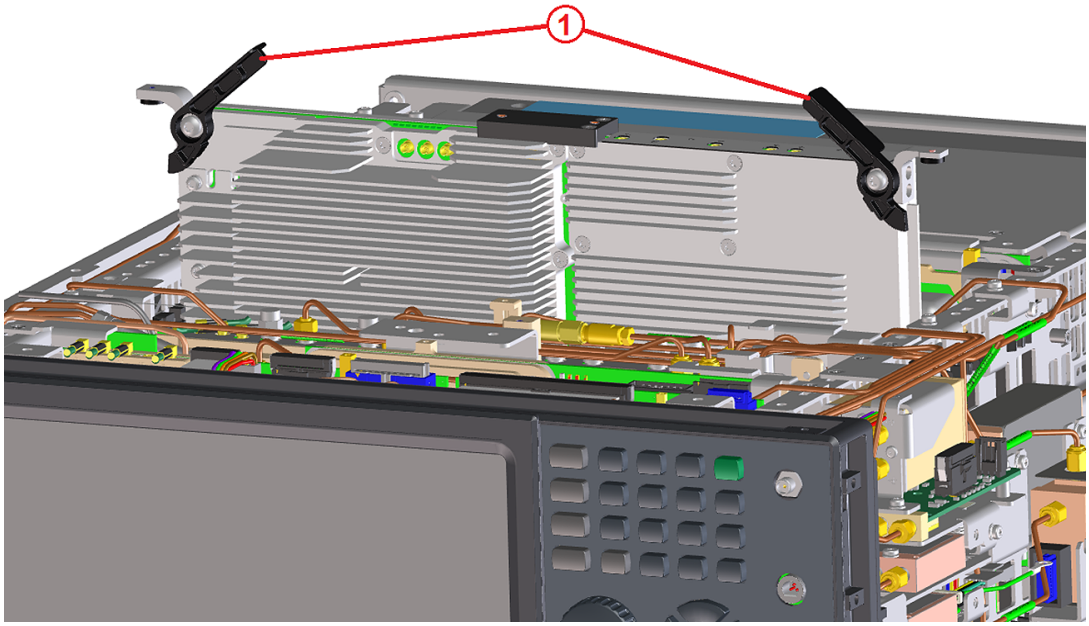
9. Referring to Figure 6, remove all the flexible RF cables highlighted from the A21 Wideband Digital IF assembly.

Figure 6 A21 Wideband Digital IF Connections Removal



10. Referring to Figure 7, use the two board extractors (1) to carefully remove the A21 Wideband Digital IF from the instrument.

Figure 7 A21 Wideband Digital IF Extraction

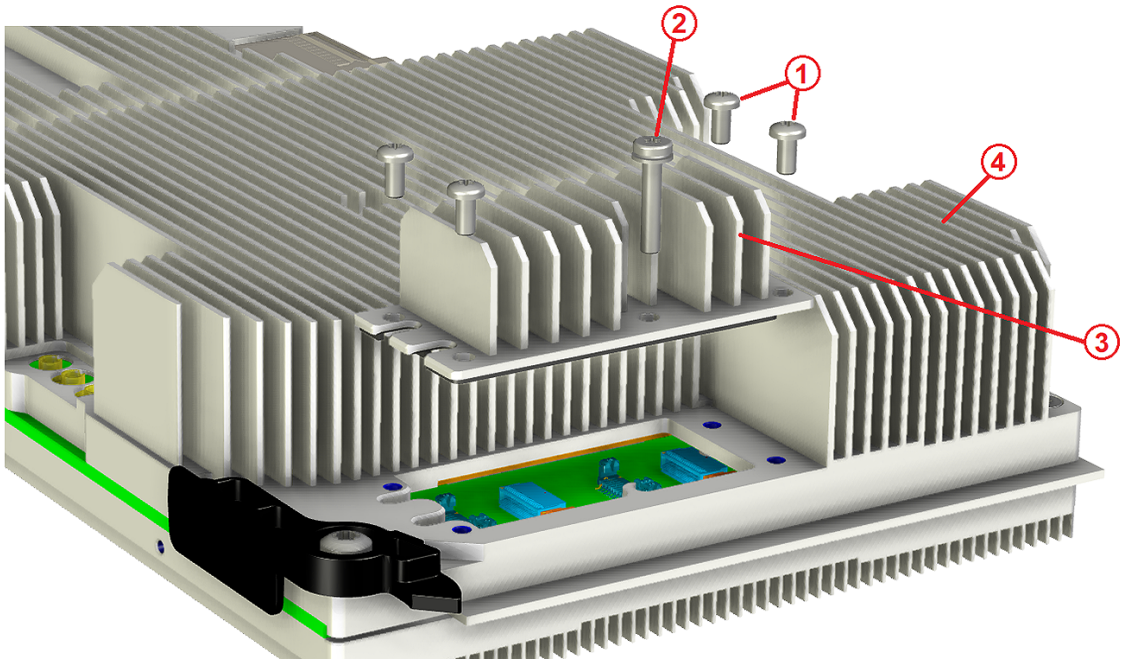


ODI Cable Installation

ODI Heatsink Removal

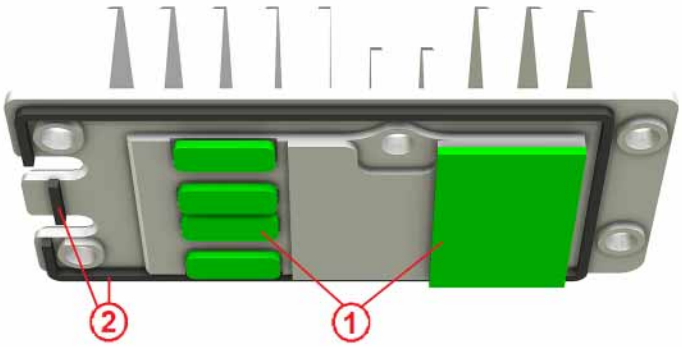
1. Referring to Figure 8, remove the four short panhead screws (1) and the one long panhead screw (2) attaching the ODI heatsink (3) to the A21 Wideband Digital IF (4).

Figure 8 ODI Heatsink Removal



2. Remove the ODI heatsink (3) from the A21 Wideband Digital IF (4), making sure that all the thermal pads (1) and gasketing (2) come with it, as seen in Figure 9. Discard the heatsink, the gasketing, and the thermal pads.

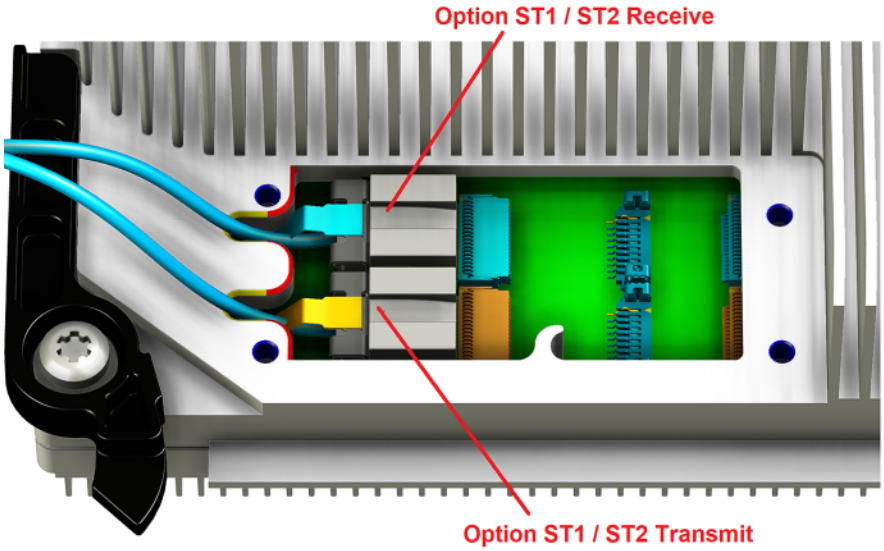
Figure 9 ODI Heatsink Thermal Pads and Gasketing



ODI Cable Installation

The ODI cable provided in this kit has two connectors that need to be installed on the A21 Wideband Digital IF assembly. One is blue and the other is orange. The blue connector is the receiver end, and the orange is the transmitter, so they need to be installed in the correct location on the A21 assembly, as seen in Figure 10.

Figure 10 ODI Cable Connector Locations

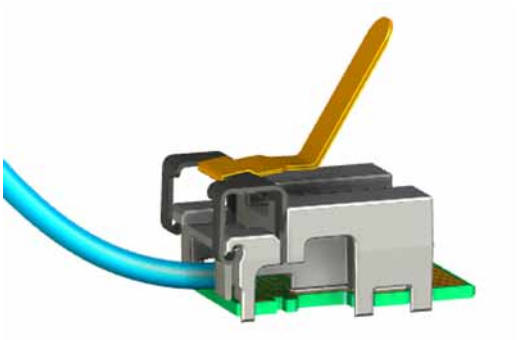


There is a tool included in this kit that needs to be used to install these connectors, as seen in Figure 11. The following procedure will describe and illustrate how this tool is used.

Figure 11 ODI Connector Tool

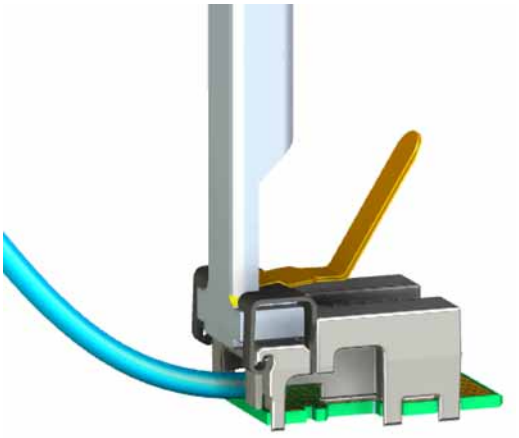
3. Use the pull tab on the orange ODI cable connector to lift the locking tab of the connector up, as seen in Figure 12.

Figure 12 ODI Connector Unlocked



4. Insert the connector tool into the connector lock, as seen in Figure 13.

Figure 13 ODI Tool Inserted into Connector Lock



5. Use the connector tool to lower the cable connector over the orange connector on the A21 Wideband Digital IF, as seen in Figure 14 and Figure 15.

Figure 14 Lower Cable Connector into Place

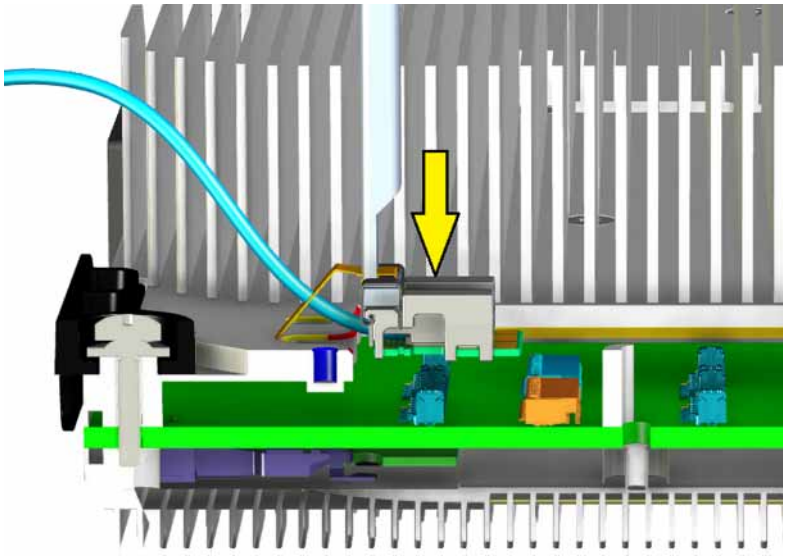
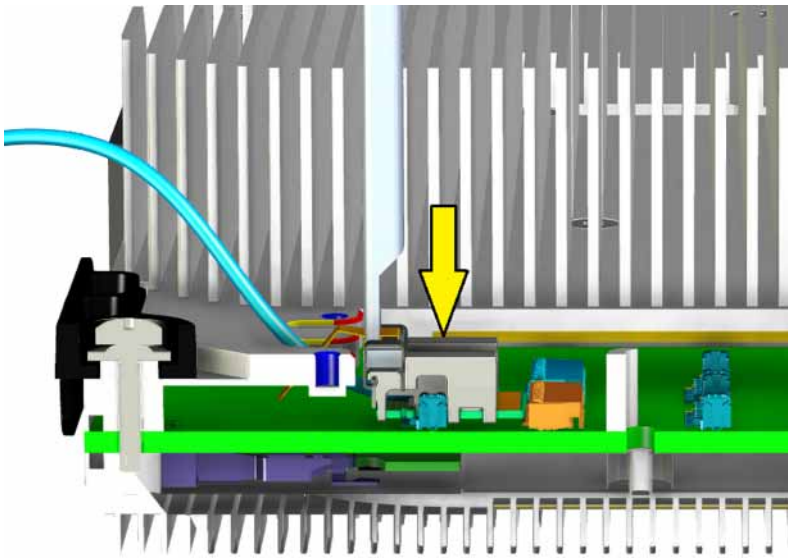
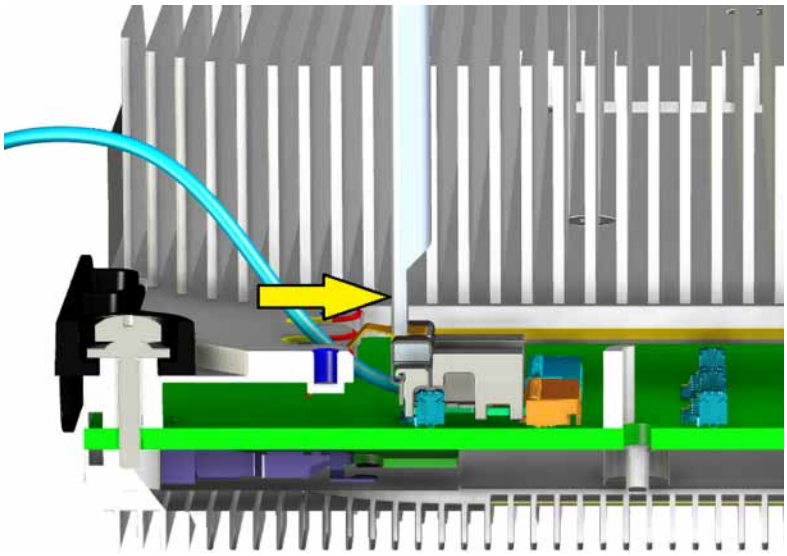


Figure 15 Cable Connector Lowered onto Board



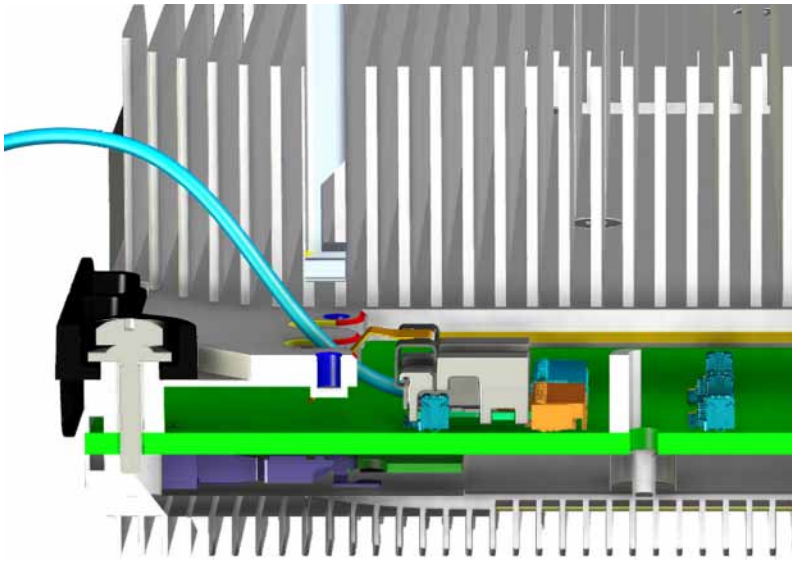
6. Use the tool to slide the connector forward to engage the connector, as seen in Figure 16.

Figure 16 Cable Connector Slide into Place



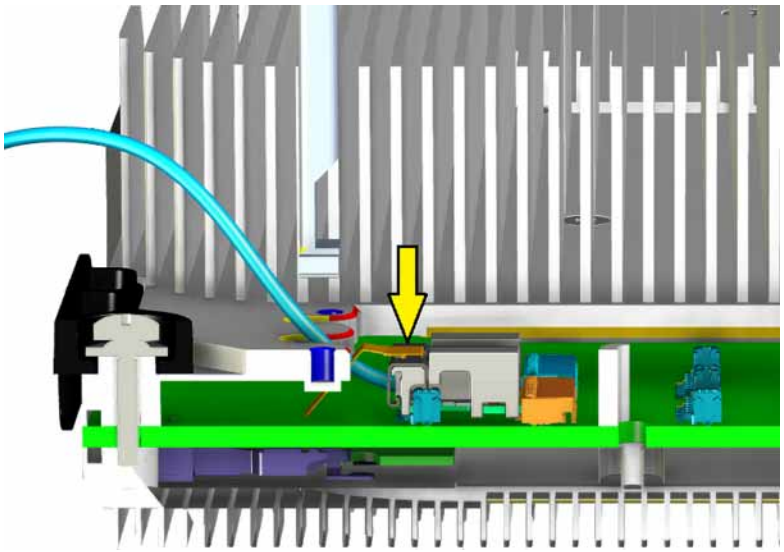
7. Remove the connector tool from the ODI cable connector, as seen in Figure 17.

Figure 17 ODI Tool Removed



8. Press the cable connector lock down to lock it into place, as seen in Figure 18.

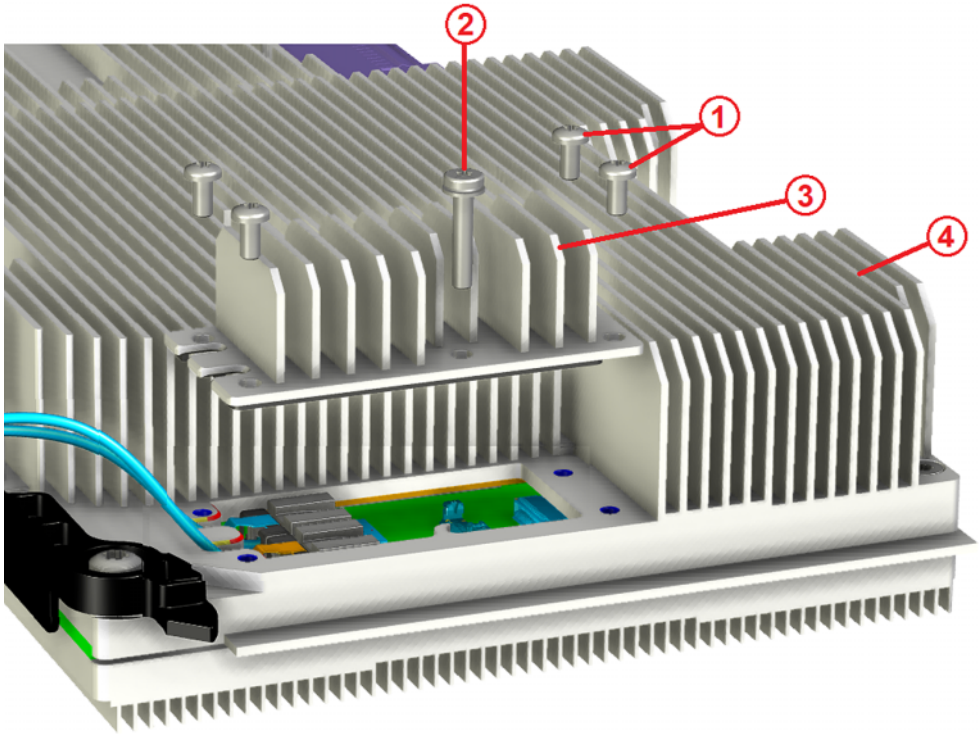
Figure 18 Cable Connector Locked into Place



9. Use the ODI connector tool to install the blue cable connector into the connector on the A21 Wideband Digital IF next to the orange cable that was just installed, as seen in Figure 10.
10. Properly router all the ODI cables so that they do not get pinched when the new heatsink is put into place, as seen in Figure 10.

11. Referring to Figure 19, install the new ODI heatsink (3) with four short new flathead screws (1) and the one original long flathead screw (2) onto the A21 Wideband Digital IF assembly (4). Torque all the screws to 9 in-lbs.

Figure 19 Install New ODI Heatsink



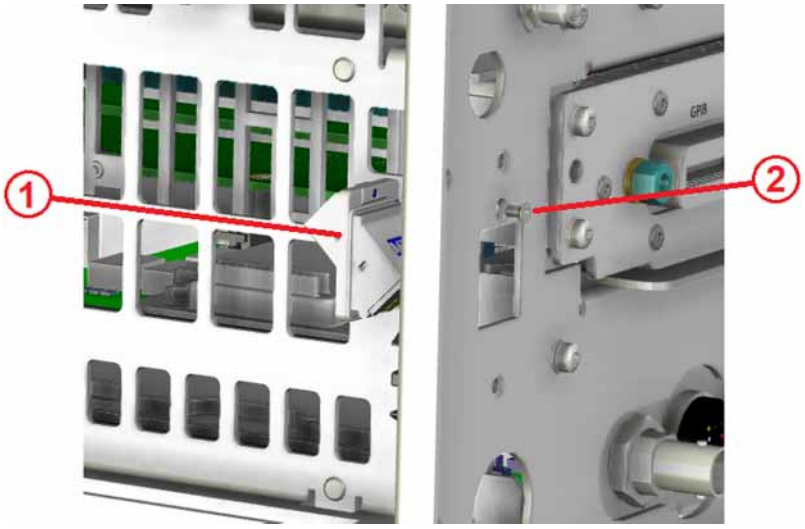
NOTE Be sure that all the thermal pads and gasketing are properly in place on the underside of the heatsink, as seen in Figure 9, before placing the new heat sink in position.

Hardware Assembly

Install Rear Panel ODI Connector

1. Referring to Figure 20, attach the rear panel ODI connector (1) to the rear frame using the flathead screw provided (2). Torque the screw to 6 in-lbs.

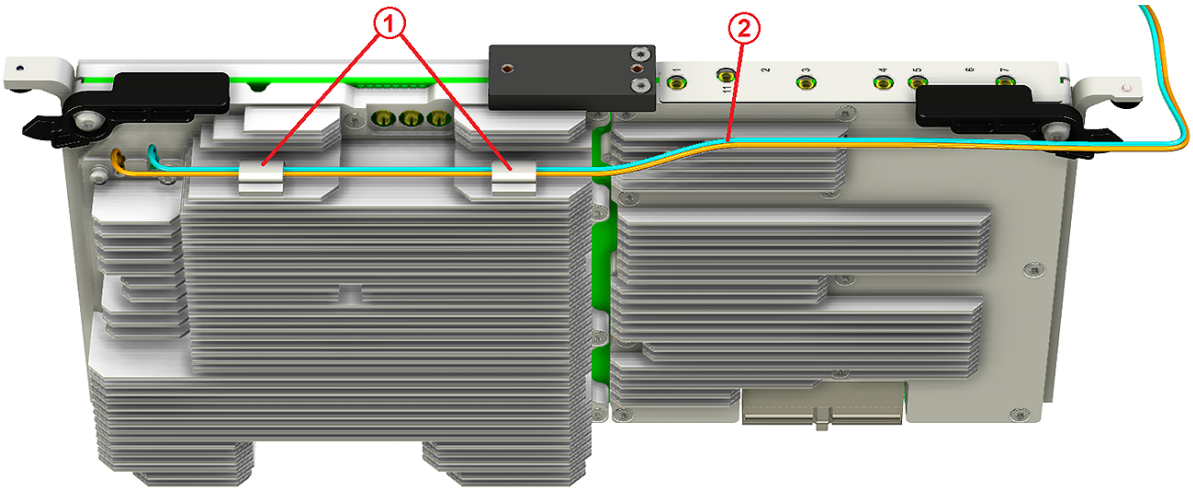
Figure 20 Install Rear Panel ODI Connector



Reinstall A21 Wideband Digital IF

2. Install the two adhesive cable clips (1) to the A21 Wideband Digital IF heatsink (1), as seen in Figure 21.

Figure 21 Adhesive Cable Clips Installation

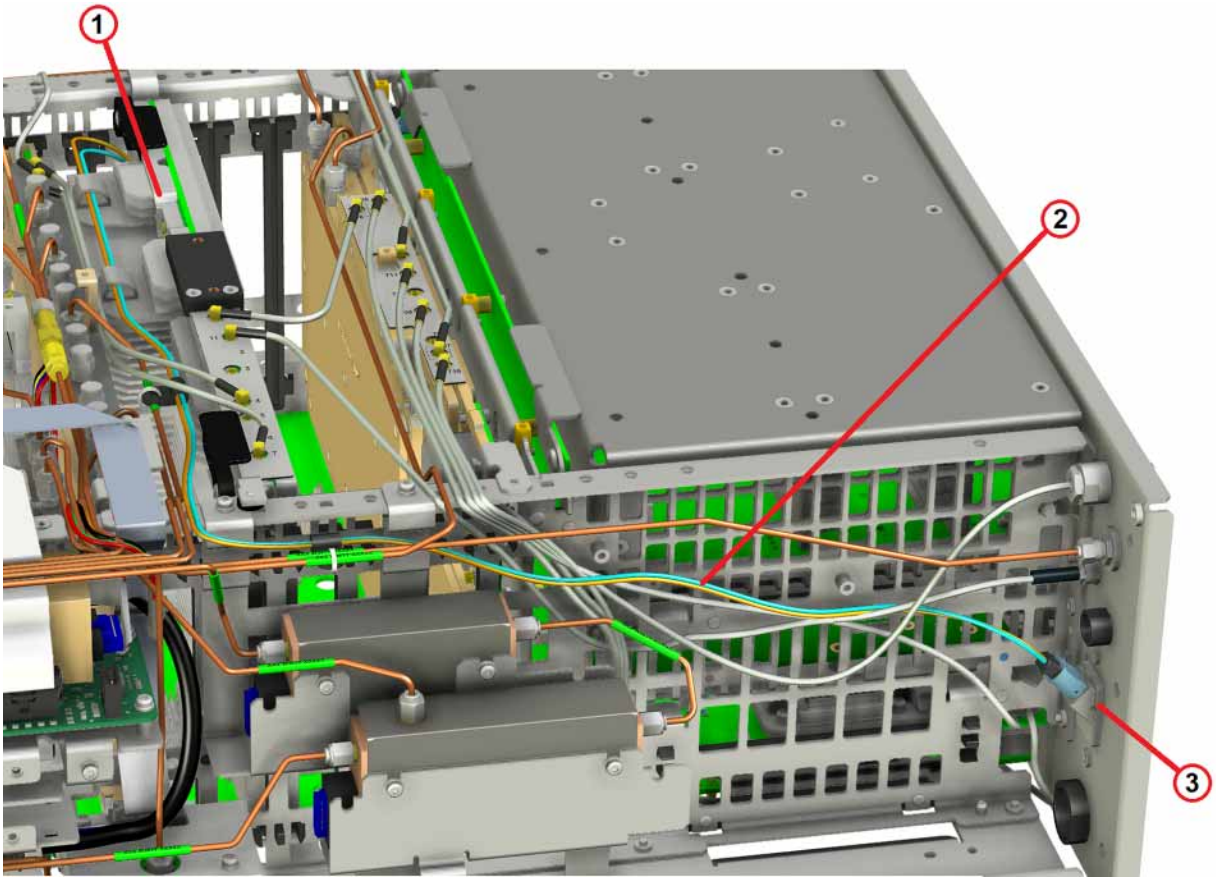


3. Insert the ODI cable (2) into the two adhesive cable clips (1), as seen in Figure 21.

CAUTION Great care needs to be taken when installing, removing, and handling any of the Optical Data Interface cables as they can be easily damaged if they are bent too tight or pinched.

4. Referring to Figure 22, reinstall the A21 Wideband Digital IF assembly (1) back into Slot 5 of the A8 Motherboard, while carefully routing the ODI cable (2) as shown.
5. Insert the end of the ODI cable into the rear panel ODI connector (3) that was just installed.

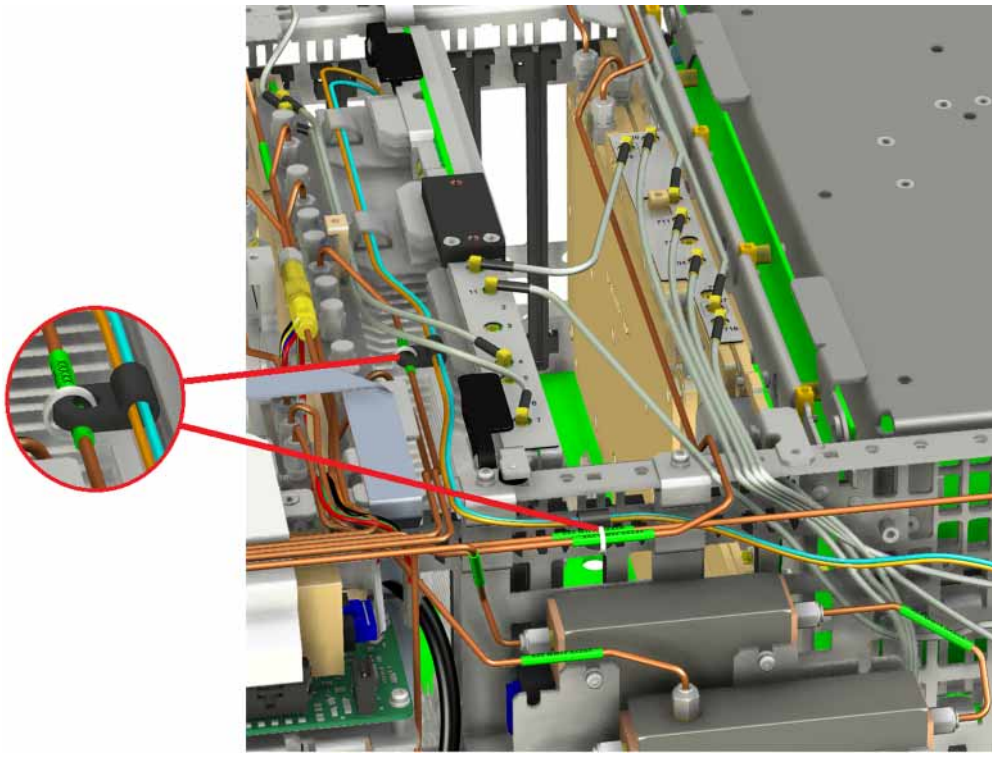
Figure 22 A21 Wideband Digital IF and ODI Cable Installation



Secure ODI Cable

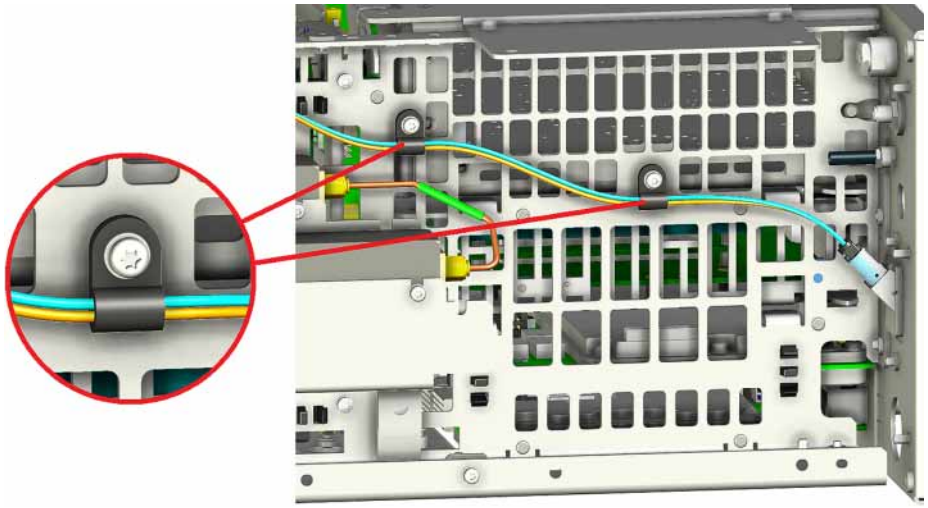
6. Referring to Figure 23, secure the ODI cable to the semi-rigid cables using two screw mount cable clamps and two nylon cable ties in the areas shown.

Figure 23 Secure ODI Cable to Semi-Rigid Cables



7. Referring to Figure 24, secure the ODI cable to the instrument chassis with two screw mount cable clips and two panhead screws in the locations shown. Torque the screws to 9 in-lbs.

Figure 24 Secure ODI Cable to Chassis



Reinstall A21 Coax Cables

8. Referring to Figure 25, reinstall the four coax cables to the A21 Wideband Digital IF, as listed in Table 2.

Figure 25 A21 Wideband Digital IF Connections

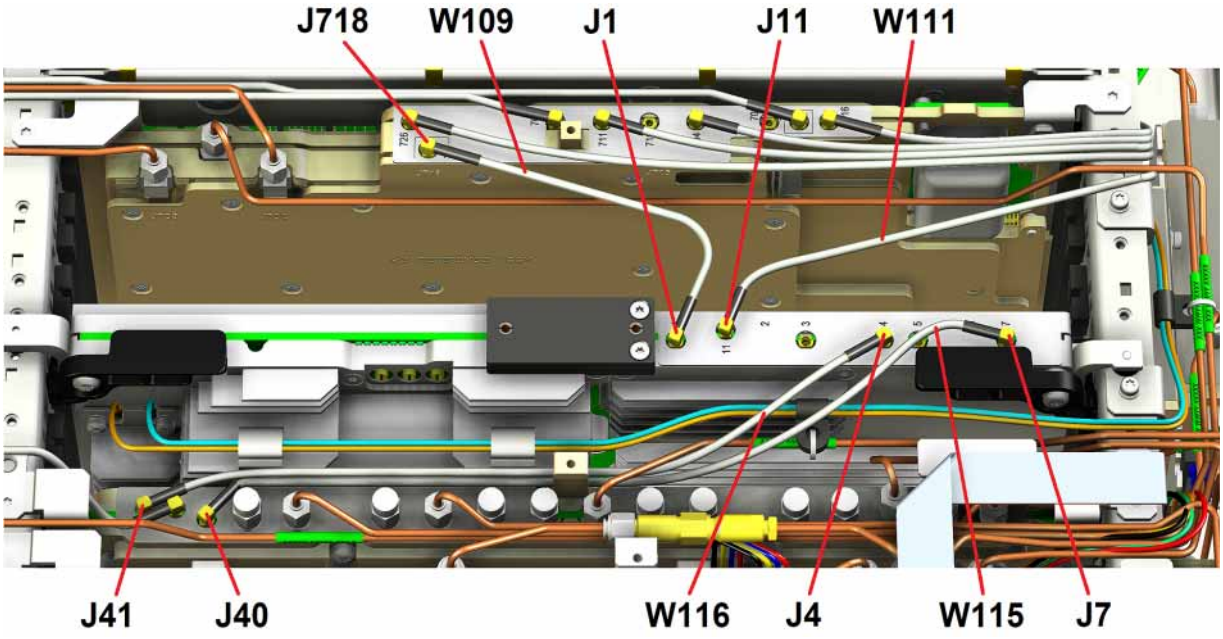


Table 2 A21 Wideband Digital IF Connections

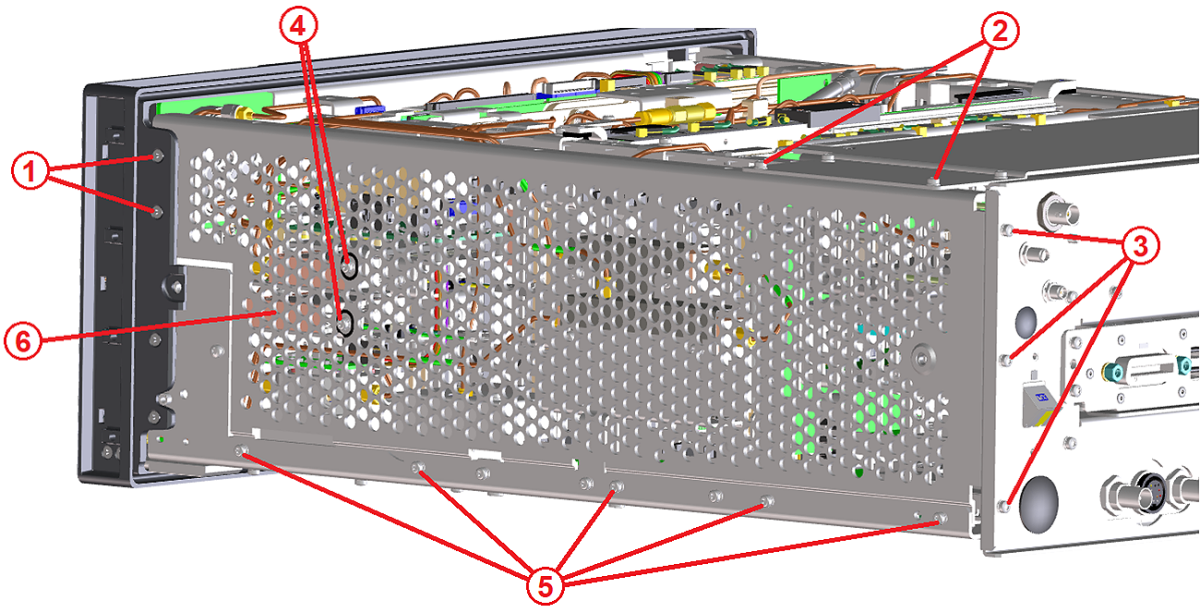
A21 Port	To/From	Cable
J1	From A16 Reference J718	W109
J4	From A23 IF Mux J41	W116
J7	From A23 IF Mux J40	W115
J11	From Rear Panel Trigger 3 In	W111

Instrument Button Up

Side Bracket Installation

1. Referring to Figure 26, reinstall the side bracket (6) and secure it to the instrument using the two flathead screws (1), the two panhead screws (2), the three panhead screws (3), the two panhead screws (4), and the five panhead screws (5). Torque all screws to 9 in-lbs.

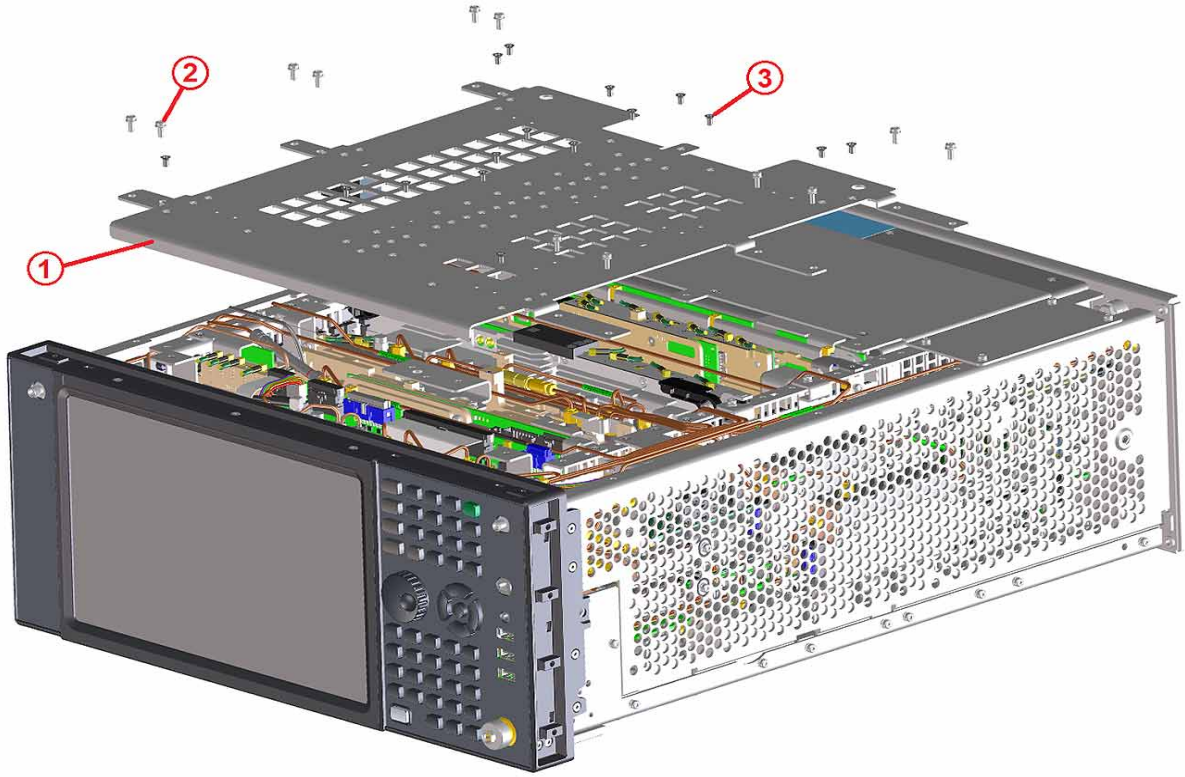
Figure 26 Side Bracket Installation



Top Brace Installation

2. Referring to Figure 27, replace the top brace (1) and secure it with the sixteen new flathead screws (3) and the twelve panhead screws (2). Torque all screws to 9 in-lbs.

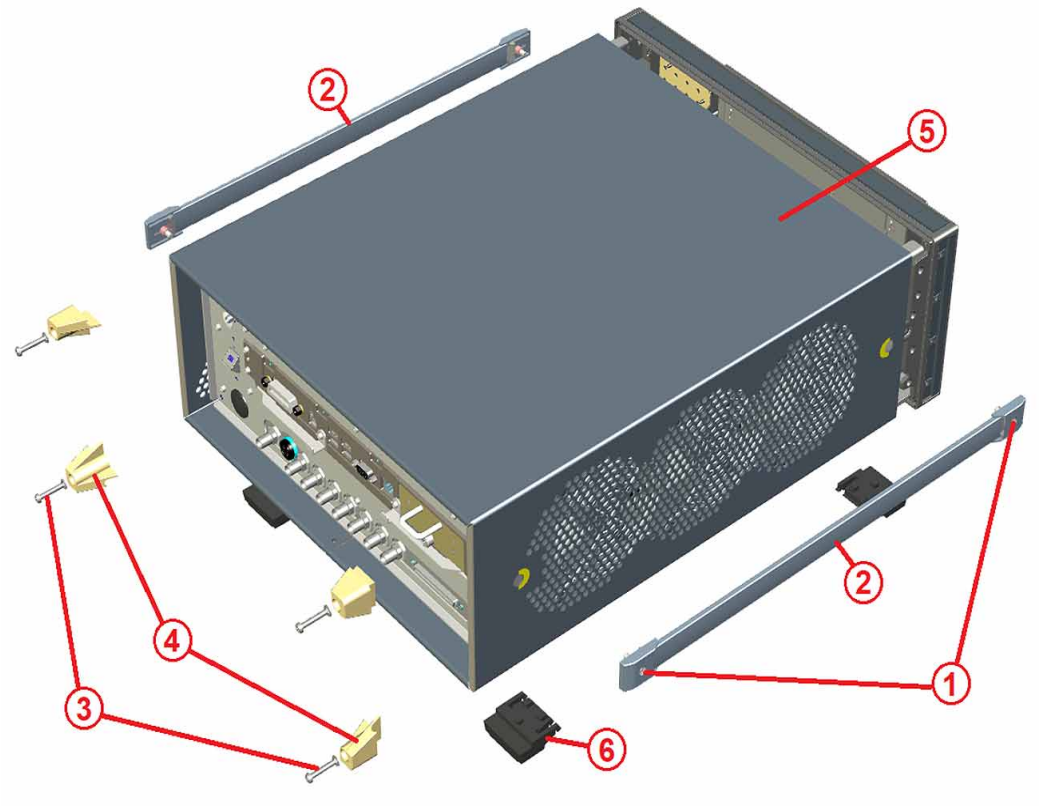
Figure 27 Top Brace Installation



Dress Cover Installation

3. Referring to Figure 28, carefully slide the outer cover (5) onto the instrument.

Figure 28 Dress Cover Installation



4. Attach the four rear feet (4) using the four panhead screws and washers (3). Torque the screws to 21 in-lbs.
5. Install the four bottom feet (6) along with the locking keys.
6. Install the strap handles (2) to both side of the instrument using the two screws (1) at either end of the handles. Torque the screws to 21 in-lbs.

Rear Panel Labels

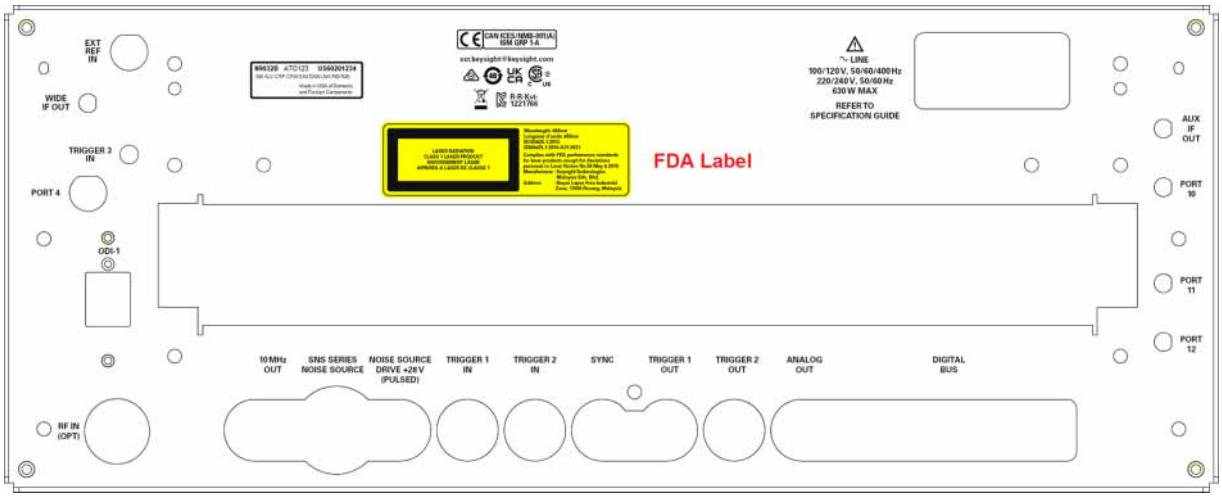
NOTE It is very important that all instructions in this section be closely followed, as legal and safety matters are involved.

FDA Laser Certification Label

Once upgraded, all instruments need to have one of the FDA Laser Certification labels attached to the rear panel.

The FDA laser certification label needs to be attached in the area outlined in Figure 29.

Figure 29 FDA Label Location



Instrument Software Installation

The instrument software is required to be version A.34.00 or newer for this option to be recognized. If the instrument being upgraded does not already have a version that meets this requirement, the instrument software will need to be installed at this time.

1. Download the latest instrument software version and instructions from:

   https://www.keysight.com/find/n9032b_software

2. When the instrument software update has completed the instrument will be ready to proceed with the next step in this procedure.

License Key Retrieval and Installation

1. Follow the instructions on the enclosed License Entitlement Certificate to redeem the new option license key for the instrument being upgraded.
2. Once the new license keys have been redeemed follow the installation instructions that come with the license file to install it into the instrument.
3. Once the license has been installed cycle the instrument power.
4. Verify that the license has been installed by pressing **System**, **Show System** and verify that the option is present in the listed options.

Adjustments and Performance Verification

Manual Procedures Required

ODI Loopback Test

Automated Utilities Required

None

Automated Adjustments Required

None

Automated Performance Testing Required

Noise Density

Residual Response

Displayed Average Noise Level

IF Frequency Response

IF Amplitude Accuracy

For assistance, contact your nearest Keysight Technologies Sales and Service Office.
To find your local office access the following URL:

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

ODI Loopback Test

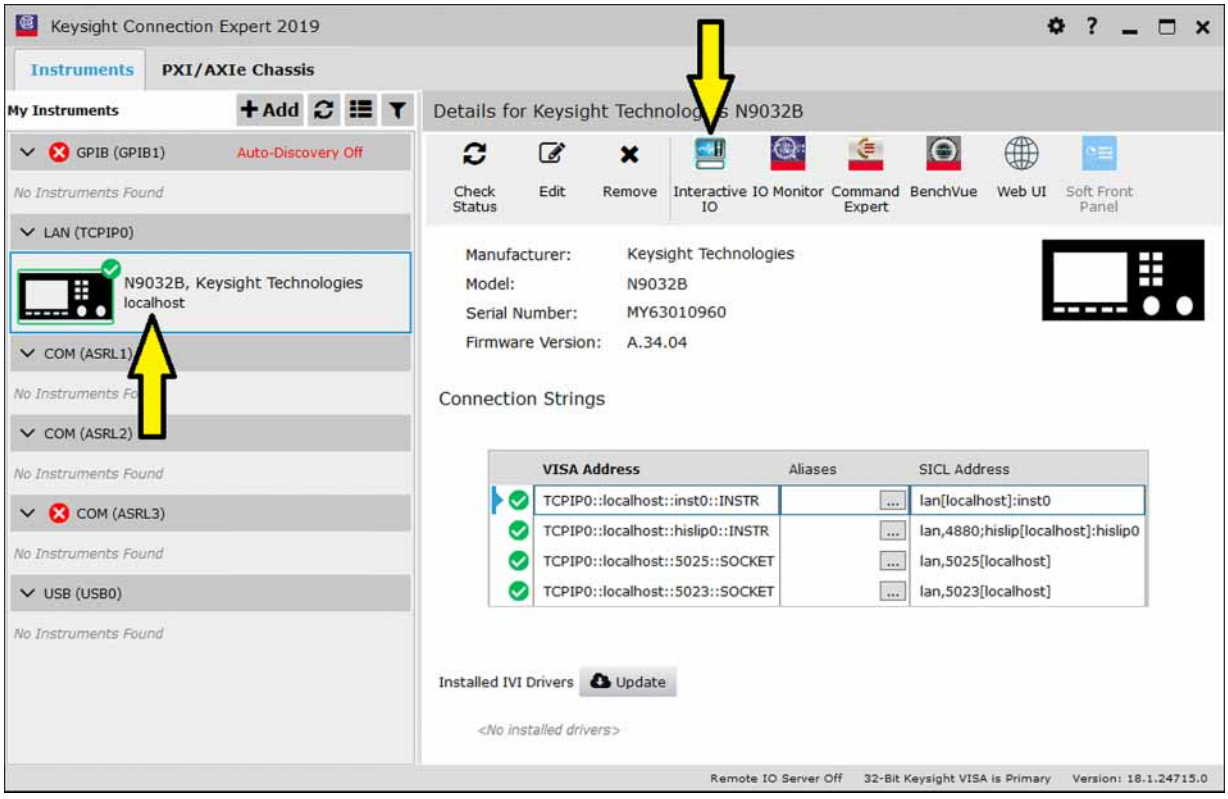
Use the following procedure to run the loopback test to verify that the newly installed streaming option hardware is working properly.

1. Connect a USB keyboard and mouse to the instrument.
2. Change the instrument mode and measurement to IQ Analyzer mode and the Streaming measurement by pressing **Mode/Meas**, **IQ Analyzer, Streaming**, **OK**.
3. Insert the Loopback Dongle that is included with this kit (M8121-60004) into the rear panel ODI port with the alignment tab pointing up, making sure that it positively snaps into place.

NOTE It is very important that the dongle is correctly inserted all the way into the rear panel ODI port. It must click into place such that it cannot be removed without sliding the spring loaded latch to release it.

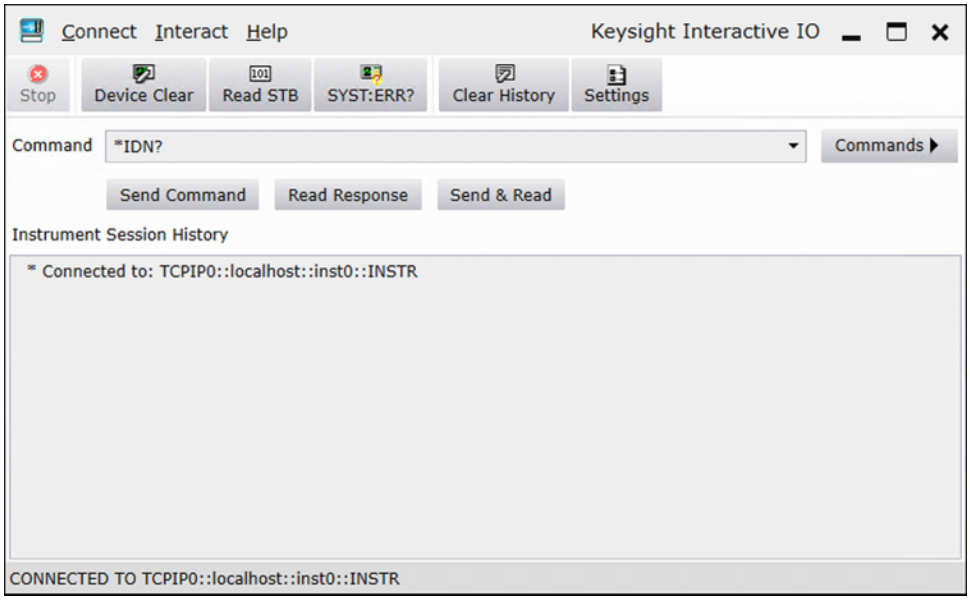
4. Using the USB mouse, select **Start**, **Keysight Connection Expert**. You should then see the connection expert, as seen in Figure 30.

Figure 30 Keysight Connection Expert



5. Select the instrument listed as **localhost**, then select **Interactive IO** for it. You will then see the Interactive IO window for the instrument, as seen in Figure 31.

Figure 31 Interactive IO



6. To run the test, type the following command into the **Command** field:

   :serv:cal:piec 'StreamingBERAlignment'

7. Press **Send Command**.
8. To verify that the test passed, type the following into the **Command** field:

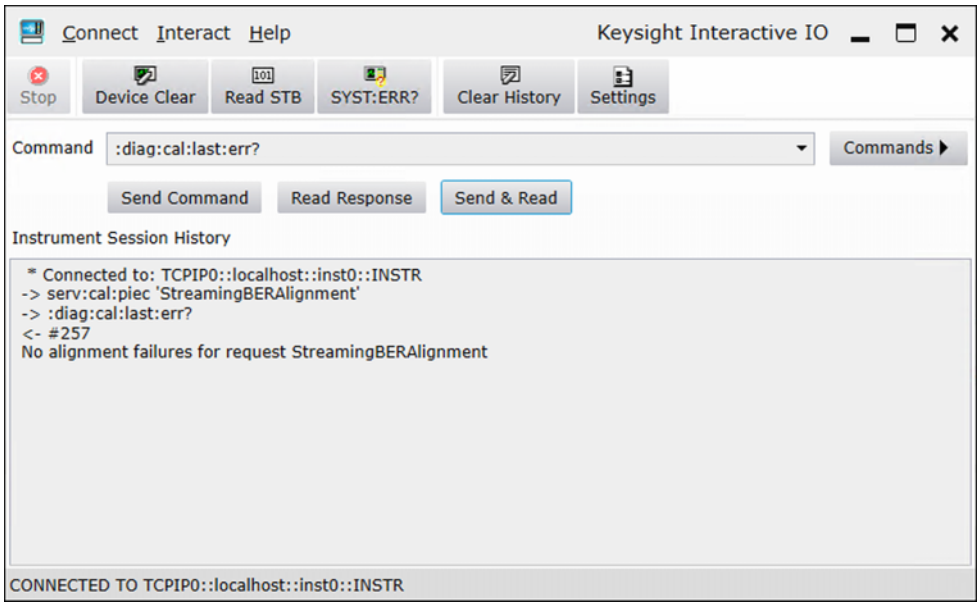
   :diag:cal:last:err?

9. Press **Send & Read**.

10. As seen in Figure 32, the response from the instrument should include:

No alignment failures for request StreamingBERAlignment

Figure 32 Loopback Test Results



If the test shows a failure, make sure that the loopback dongle is properly inserted into the rear panel ODI port.

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