Keysight J-BERT M8020A High-Performance BERT and M8030A Multi-Channel BERT

Installation Guide

KEYSIGHT TECHNOLOGIES

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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.

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements. Product manuals are provided with your instrument on CD-ROM and/or in printed form. Printed manuals are an option for many products. Manuals may also be available on the Web. Go to www.keysight.com and type in your product number in the Search field at the top of the page.

General

This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

All Light Emitting Diodes (LEDs) used in this product are Class 1 LEDs as per IEC 60825-1.

Environment Conditions

This instrument is intended for indoor use in an installation category II, pollution degree 2 environment. It is designed to operate at a maximum relative humidity of 95% and at altitudes of up to 2000 meters.

Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

Before Applying Power

Verify that all safety precautions are taken. The power cable inlet of the instrument serves as a device to disconnect from the mains in case of hazard. The instrument must be positioned so that the operator can easily access the power cable inlet. When the instrument is rack mounted the rack must be provided with an easily accessible mains switch.

Ground the Instrument

To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

Do Not Operate in an Explosive Atmosphere

Do not operate the instrument in the presence of flammable gases or fumes.

Do Not Remove the Instrument Cover

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified personnel.

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Safety Symbols

Table 1 Safety Symbol

Symbol	Description
	Indicates warning or caution. If you see this symbol on a product, you must refer to the manuals for specific Warning or Caution information to avoid personal injury or damage to the product.
	Frame or chassis ground terminal. Typically connects to the equipment's metal frame.
	KC is the Korean certification mark to demonstrate that the equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.
	Indicates that antistatic precautions should be taken.
	Indicates the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.
	The RCM Mark is a compliance mark to the ACMA (Australian Spectrum Management Agency). This indicates compliance with all Australian EMC regulatory information.

Symbol	Description
	CSA is the Canadian certification mark to demonstrate compliance with the Safety requirements.
	CE compliance marking to the EU Safety and EMC Directives. ISM GRP-1A classification according to the international EMC standard. ICES/NMB-001 compliance marking to the Canadian EMC standard.
	This symbol on all primary and secondary packaging indicates compliance to China standard GB 18455-2001.

Compliance and Environmental Information

Table 2 Compliance and Environmental Information

Safety Symbol	Description
	This product complies with WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in WEEE Directive Annex I, this product is classed as a “Monitoring and Control instrumentation” product. Do not dispose in domestic household waste. To return unwanted products, contact your local Keysight office, or see http://about.keysight.com/en/companyinfo/environment/takeback.shtml for more information.

About This Guide

This guide provides detailed information for installing Keysight M8000 modules, including the Keysight M9536A AXIe Embedded Controller, AXIe System Module (ASM) in the Keysight M9505A/M9514A AXIe chassis. The procedures in this guide are not required for "bundled" systems such as the M8020A-BU1, M8020A-BU2, M8030A-BU1 or M8030A-BU2. For these systems, refer to the *M8020A and M8030A Getting Started Guide*.

After performing the procedures in this document, you are directed to procedures in the *M8020A and M8030A Getting Started Guide* to complete the installation.

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1 System Requirements

This chapter provides information about possible configurations for Keysight M8020A and M8030A.

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Hardware and Software Requirements

The following are the hardware and software requirements that should be met before the installation of software components on the controller (host computer):

Minimum hardware requirements

- Pentium® processor 1 GHz or equivalent
- 16 GB available RAM
- USB 3.0 connection
- PCIe 2.0/8x (only for highest data throughput and desktop PC)
- VGA resolution 1024 x 768
- 1.5 GB or more free hard disc space

Software requirements

- The following operating systems are supported:
  - Windows 7 (64 bit) SP1
  - Windows 8 (64 bit)
  - Windows 8.1 (64 bit)
- Keysight I/O libraries version 16.3

NOTE The M8070A software is required to control the M8020A and M8030A. M8070A-0TP or M8070A-0NP license is required for controlling hardware.

NOTE In case of M8020A, PCIe connectivity between the M9505A AXIe Chassis and an external desktop PC controller is recommended when full channel plus large patterns need to be downloaded.

Hardware Configurations for M8020A

The following section describes and illustrates various setup combinations in which you can install the M8020A modules.

NOTE **The M8041A module must be installed in slots 1 through 3 of the M9505A AXIe Chassis for proper local bus communication unless the M9536A AXIe Embedded Controller is installed (must be in slot 1).**

M8020A Base System Configuration

The base configuration is a single channel system (a second channel can be added with license) consisting of the 5-slot M9505A AXIe Chassis and an M8041A module. The M8041A occupies three slots. A maximum of two M8020A modules can be installed in a 5-slot chassis.

Figure 1 M8020A configuration for 16 Gb/s BERT with 1 to 2 channel

M8020A Four Channel System Configuration

The four channel configuration consists of the 5-slot M9505A AXIe Chassis, an M8041A module, and an M8051A module. The M8041A occupies three slots and the M8051A occupies two slots.

NOTE This configuration requires a cable (provided with the M8051A) that connects the M8041A SYNC OUT to the M8051A SYNC IN to synchronize the two modules to a common system clock.

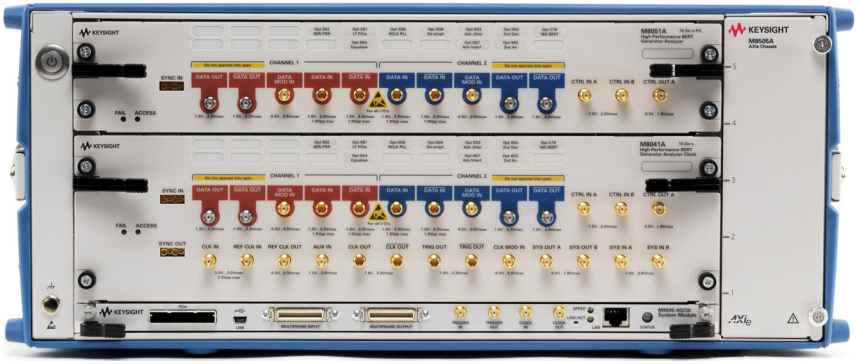


Figure 2 M8020A configuration for 16 Gb/s BERT for up to 4 channels

M8020A 32 Gb/s BERT Configuration (Pattern Generator Only)

A typical configuration using the M8061A 32 Gb/s multiplexer with de-emphasis consists of the 5-slot M9505A AXIe Chassis, an M8041A module, and an M8061A module. The M8041A occupies three slots and the M8061A occupies two slots.

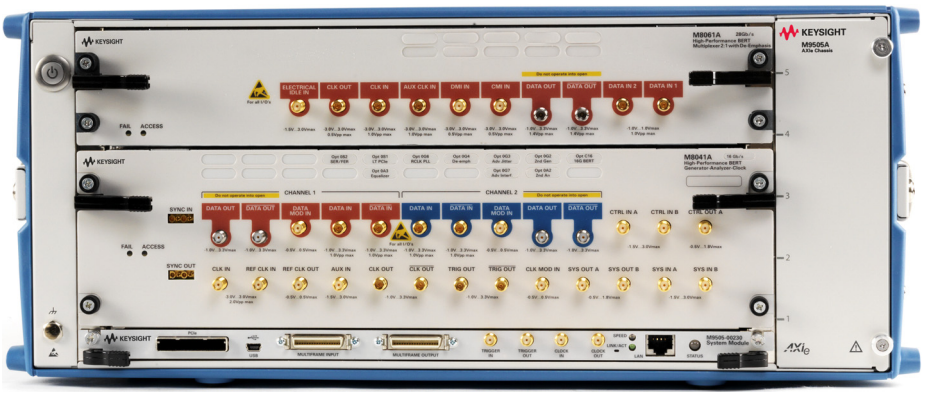


Figure 3 M8020A configuration for 32 Gb/s BERT (external demultiplexer is recommended)

M8062A 32Gb/s Front-end for J-BERT M8020A High-Performance BERT

A typical configuration for an M8020A 32 Gb/s full BERT consists of the 5-slot M9505A AXIe Chassis, an M8041A module, and an M8062A module. The M8041A occupies three slots and the M8062A occupies two slots.

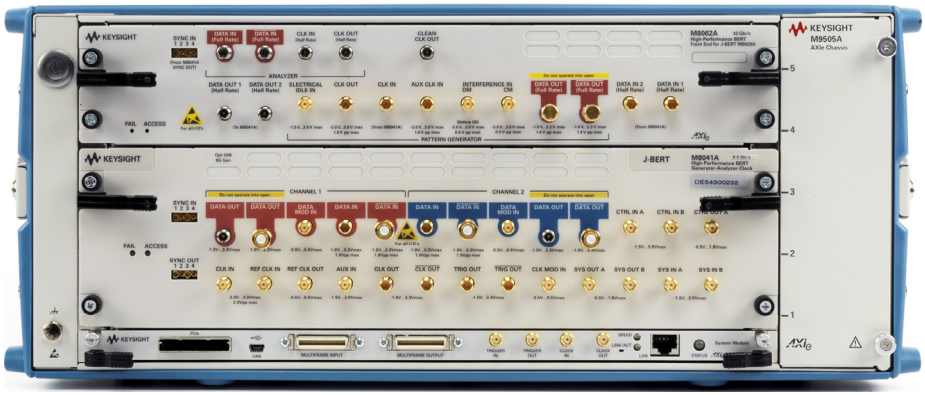


Figure 4 M8020A configuration for 32 Gb/s BERT

Single M8020A LAN Network Configuration

Multiple engineers can all be connected to a single M8020A via a LAN network and controlled using the M8070A software running on a host PC. The host PC tracks the number of licenses checked out and the number of licenses available for use. In addition, the host PC can be a dedicated computer running the license server or it can also run the M8070A software concurrently. The M9536A AXIe Embedded Controller can also be used as the host PC in this configuration.

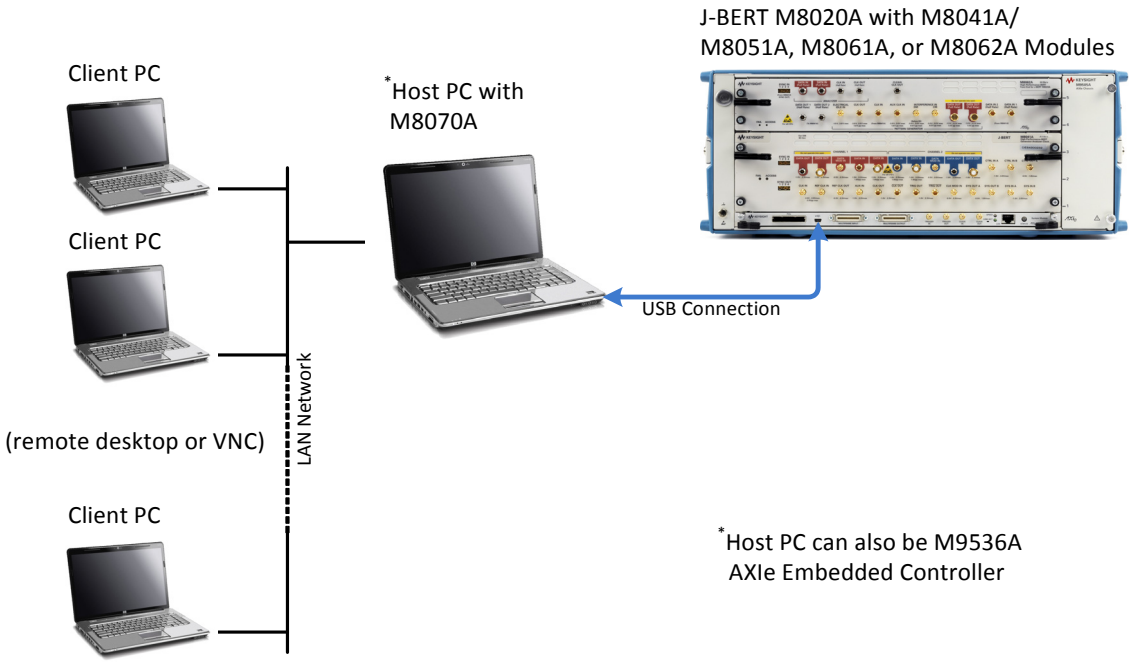


Figure 5 Single M8020A LAN network configuration

Hardware Configurations for M8030A

The M8030A is a modular test solution which can be tailored to your specific needs from two channels with one M8041A to up to 10 channels.

The M8030A supports the following modules.

- M8041A high-performance BERT generator-analyzer-clock 8/16 Gb/s
- M8051A high-performance BERT generator-analyzer 8/16 Gb/s
- M8192A Multi-channel synchronization module

The modules must be installed in the M9514A AXIe 14-slot chassis as shown in Table 3 on page -18:

Table 3 M8030A modules' arrangement in the M9514A AXIe chassis

Slot Number	Module
# 1	For M8030A-BU1, M9536A AXIe embedded controller. For M8030A-BU2, this slot is empty and covered with filler front-panel
# 2-4	M8041A module
# 5-6	M8051A module
# 7	M9521A AXIe system module, always included in M8030A-BU1 or M8030A-BU2, mandatory
# 8-9	M8051A module
# 10-11	M8051A module
# 12-13	M8051A module
# 14	M8192A multi-channel synchronization module, mandatory

Figure 6 on page -19 shows an example of modules arrangement in the M9514A AXIe 14-slot chassis.

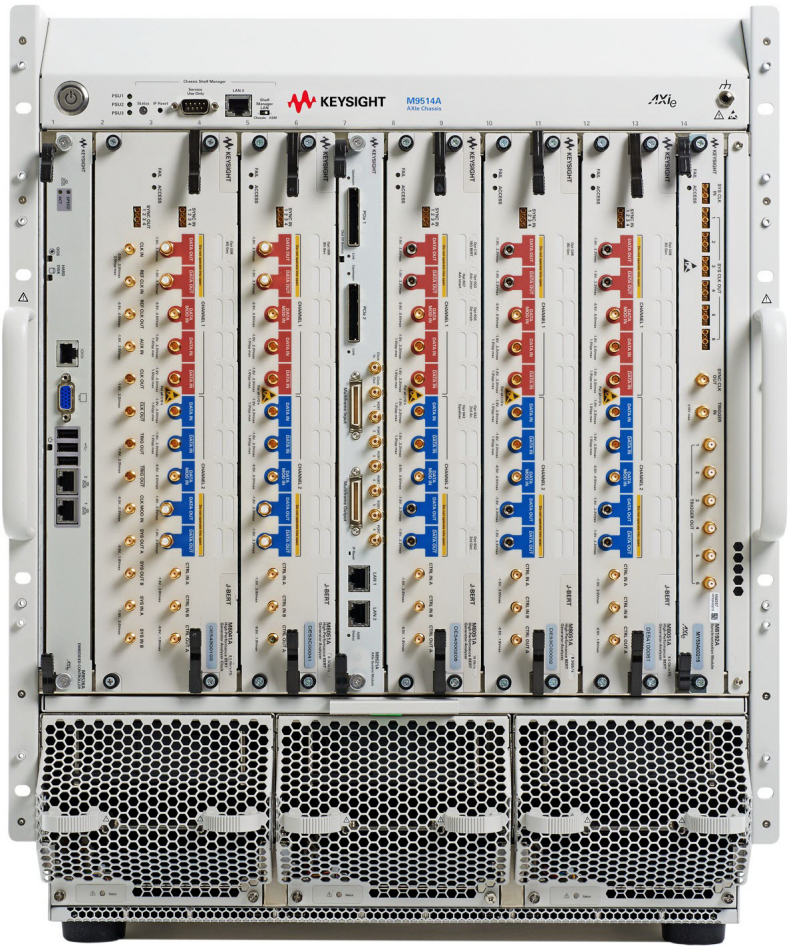


Figure 6 Example of M8030A module arrangement

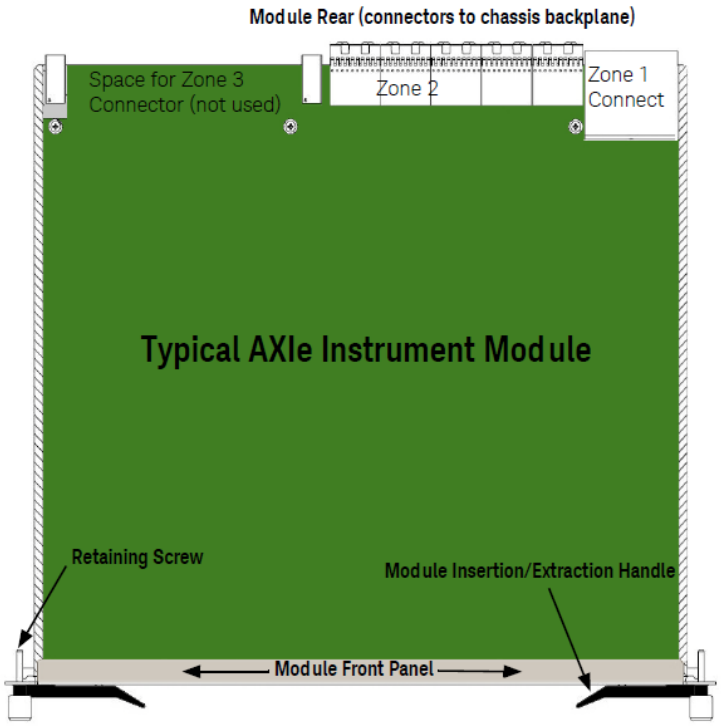
2 Installing Modules

This chapter provides hardware installation procedures for M8020A and M8030A modules.

AXIe Instrument Modules

The chassis slots accept AXIe instrument modules. These may comprise one or more instruments for signal injection, data acquisition, and measurement. Install them in any available AXIe slot.

The drawing below illustrates the AXIe module's general layout, backplane connections and chassis fasteners, viewed from the top.



Test connections are made at the module's front panel. The front panel and backplane connectors will vary depending on the module.

Installing M8020A Module(s)

NOTE The procedures in this section are not required if your system is an M8020A-BU1 or M8020A-BU2, which have their modules pre-installed.

The M9505A AXIe Chassis and M8020A module(s) will come in separate shipments. This section shows how to carefully insert a module in an empty slot of an M9505A AXIe Chassis. The slots are identified by the slot numbers written on the front panel of the chassis.

NOTE If you plan to use the M9536A AXIe Embedded Controller as the host computer, then you must reserve slot 1 of the chassis for this module's installation.

CAUTION

- The instrument modules are not hot swappable. You must power down the AXIe chassis and host PC before inserting, replacing, or removing a module.
- The enclosure surface of the instrument module may become hot during use. If you need to remove the module, first power down the AXIe chassis, allow the module to cool, and then pull the module out of the chassis.

To install the M8041A module

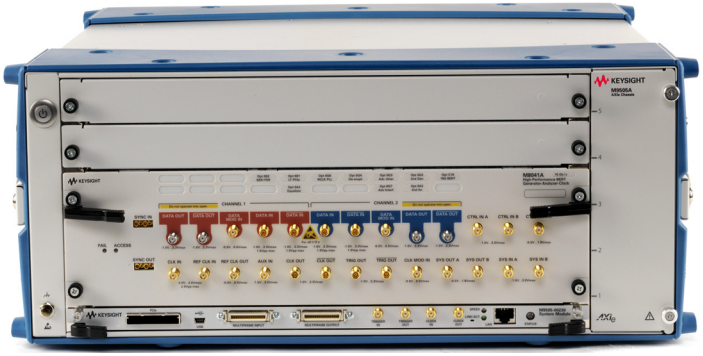


Figure 7 Installed M8041A module in slots 1 through 3

Ensure that the chassis is NOT powered up or connected to a power source while installing an instrument/embedded controller module.

1 If you are not installing the M9536A AXIe Embedded Controller, remove the filler panel modules that cover slots 1, 2, and 3. Loosen the retaining screws on both sides of the filler panel module until the filler panel module is completely disengaged. Then gently pull the module out of the chassis holding the screws.

2 If you are installing the M9536A AXIe Embedded Controller, remove the filler panel modules that cover slots 2, 3, and 4. Loosen the retaining screws on both sides of the filler panel module until the filler panel module is completely disengaged. Then gently pull the module out of the chassis holding the screws.

Figure 8 Filler panel module removed

3 Locate the module insertion/extraction handles at both ends of the instrument module. Extend the ends of both handles, by pulling them inwards towards each other. Then fully open the handles by pivoting them out towards you.

4 Align the module's PCA board with the guide rails on both ends of the M9505A AXIe Chassis.

5 Push the module into the chassis slot until the leading edges of the insertion/extraction latches rest against the front surface of the chassis. The insertion/extraction latch handles should be perpendicular to the front surface of the chassis (aligned with the direction of module insertion). Nudge the module gently inward to allow the latches to engage.

6 Using your thumbs, press inward firmly on the insertion/extraction handles until the module is seated firmly in the chassis backplane. The module front panel should lie flush with the chassis front panel.

7 Push the handles ends towards the edge of the chassis to tuck them away.

8 Tighten the retaining screws on either end of the module to ensure the ground connection.

Figure 9 Tighten retaining screws

After you have installed the module in the chassis, ensure that remaining slots have filler panel modules installed.

NOTE

Do not operate the chassis without filler panels in empty slots. This is especially important for the slots on either side of the instrument module. This allows proper air flow and cooling, and provides EMI shielding for the chassis and installed components. Leaving slots empty can increase fan speed, raise ambient noise, overheat components, and can cause the module to shut down.

To install the M8041A and M8051A modules

The M9505A AXIe Chassis has 5 slots for installing M8020A instrument modules. Install the M8041A in slots 1 through 3 and the M8051A in slots 4 and 5.

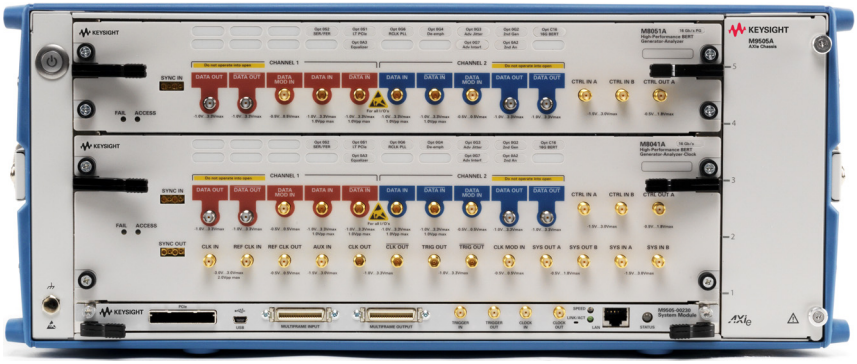


Figure 10 Installed M8041A and M8051A module

Ensure that the chassis is NOT powered up or connected to a power source while installing an instrument /embedded controller module.

1 Remove the filler panel modules that cover slots 1 through 5. Loosen the retaining screws on both sides of the filler panel module until the filler panel module is completely disengaged. Then gently pull the module out of the chassis holding the screws.

Figure 11 Filler panel module removed

2 Locate the module insertion/extraction handles at both ends of the instrument module. Extend the ends of both handles by pulling them inwards towards each other. Then fully open the handles by pivoting them out towards you.

3 Align the module's PCA board with the guide rails on both ends of the M9505A AXIe Chassis. If the module has metal plates covering the board, be sure to insert the PCA board and not the metal plates into the rails.

4 Push the module into the chassis slot until the leading edges of the insertion/extraction latches rest against the front surface of the chassis. The insertion/extraction latch handles should be perpendicular to the front surface of the chassis (aligned with the direction of module insertion). Nudge the module gently inward to allow the latches to engage.

5 Using your thumbs, press inward firmly on the insertion/extraction handles until the module is seated firmly in the chassis backplane. The module front panel should lie flush with the chassis front panel.

6 Push the handle ends towards the edge of the chassis to tuck them away.

7 Tighten the retaining screws on either end of the module to ensure the ground connection.

Figure 12 Tighten retaining screws

8 Locate the synchronization cable that was shipped with the M8051A module as shown in Figure 13 on page -28.

Figure 13 Standard synchronization cable M8041-61601

NOTE

This configuration requires the synchronization cable (provided with the M8051A) which connects the M8041A SYNC OUT to the M8051A SYNC IN to synchronize the two modules to a common system clock.

While connecting a module which requires the sync cable connection (e.g. M8051A, M8062A) to the test setup, make sure to connect the sync cable after completing the other connections and also remove the sync cable first while disconnecting the connections.

9 Route the synchronization cable as shown in Figure 14 on page -29 using the two self-adhesive cable holders.

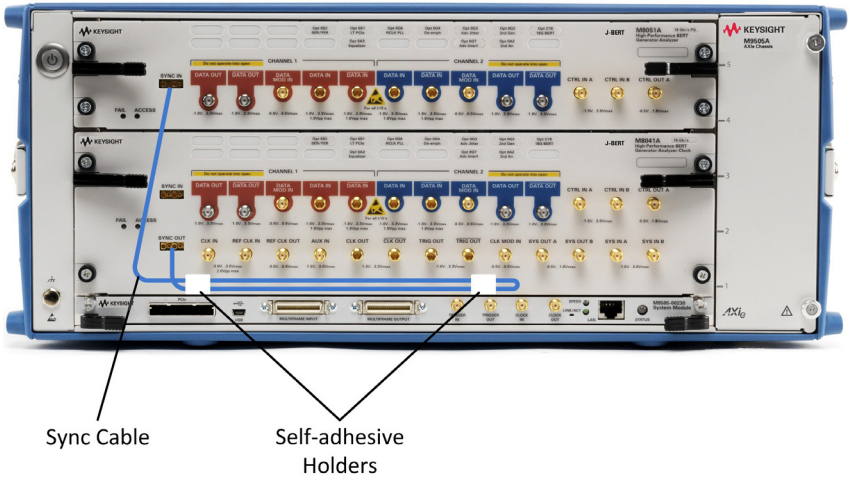


Figure 14 Synchronization cable routing

To install the M8041A and M8061A modules

The M9505A AXIe Chassis has 5 slots for installing M8020A instrument modules. Install the M8041A in slots 1 through 3 and the M8061A in slots 4 and 5.

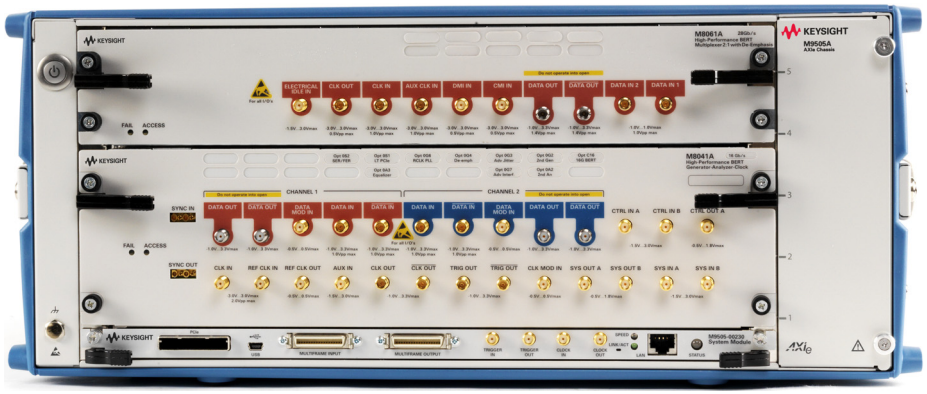


Figure 15 Installed M8041A and M8061A module

Ensure that the chassis is NOT powered up or connected to a power source while installing an instrument /embedded controller module.

1 First, remove the filler panel modules that cover slots 1 through 5. Loosen the retaining screws on both sides of the filler panel module until the filler panel module is completely disengaged. Then gently pull the module out of the chassis holding the screws.

Figure 16 Filler panel module removed

2 Locate the module insertion/extraction handles at both ends of the instrument module. Extend the ends of both handles by pulling them inwards towards each other. Then fully open the handles by pivoting them out towards you.

3 Align the module's PCA board with the guide rails on both ends of the M9505A AXIe Chassis. If the module has metal plates covering the board, be sure to insert the PCA board and not the metal plates into the rails.

4 Push the module into the chassis slot until the leading edges of the insertion/extraction latches rest against the front surface of the chassis. The insertion/extraction latch handles should be perpendicular to the front surface of the chassis (aligned with the direction of module insertion). Nudge the module gently inward to allow the latches to engage.

5 Using your thumbs, press inward firmly on the insertion/extraction handles until the module is seated firmly in the chassis backplane. The module front panel should lie flush with the chassis front panel.

6 Push the handles ends towards the edge of the chassis to tuck them away.

7 Tighten the retaining screws on either end of the module to ensure the ground connection.

Figure 17 Tighten retaining screws

To install the M8041A and M8062A modules

The M9505A AXIe Chassis has 5 slots for installing M8020A instrument modules. Install the M8041A in slots 1 through 3 and the M8062A in slots 4 and 5.

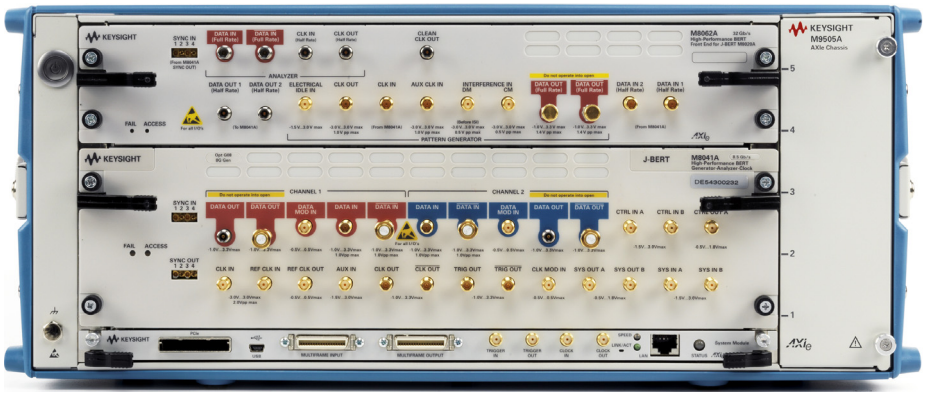


Figure 18 Installed M8041A and M8062A module

Ensure that the chassis is NOT powered up or connected to a power source while installing an instrument/embedded controller module.

1 First, remove the filler panel modules that cover slots 1 through 5. Loosen the retaining screws on both sides of the filler panel module until the filler panel module is completely disengaged. Then gently pull the module out of the chassis holding the screws.

Figure 19 Filler panel module removed

2 Locate the module insertion/extraction handles at both ends of the instrument module. Extend the ends of both handles by pulling them inwards towards each other. Then fully open the handles by pivoting them out towards you.

3 Align the module's PCA board with the guide rails on both ends of the M9505A AXIe Chassis. If the module has metal plates covering the board, be sure to insert the PCA board and not the metal plates into the rails.

4 Push the module into the chassis slot until the leading edges of the insertion/extraction latches rest against the front surface of the chassis. The insertion/extraction latch handles should be perpendicular to the front surface of the chassis (aligned with the direction of module insertion). Nudge the module gently inward to allow the latches to engage.

5 Using your thumbs, press inward firmly on the insertion/extraction handles until the module is seated firmly in the chassis backplane. The module front panel should lie flush with the chassis front panel.

6 Push the handles ends towards the edge of the chassis to tuck them away.

7 Tighten the retaining screws on either end of the module to ensure the ground connection.

Figure 20 Tighten retaining screws

To remove an M8020A module

CAUTION **The enclosure surface of the module may become hot during use. If you need to remove the module, first power down the M9505A AXIe Chassis, allow the module to cool, and then pull the module out of the chassis.**

1 Loosen the retaining screws on both ends of the module until the module is completely disengaged to prevent damaging your chassis or module.

Figure 21 Loosening retaining screws

2 Extend the ends of both module insertion/extraction handles, by pulling them inwards towards each other.

Figure 22 Removing an instrument module

3 To remove the module: Open the module insertion/extraction handles by pivoting them out towards you. This unseats the module from the chassis backplane.

4 Once the module is unseated, use the module insertion/extraction handles by pulling directly outward to remove the module from the chassis.

CAUTION Do not remove the AXIe ESM, which is integral to the operation of the chassis. An AXIe ESM that needs servicing should be removed by Keysight personnel only.

Setting up the M8020A

Benchtop Configuration

If you want to use the M8020A in a benchtop configuration, then retain the plastic bumpers and carry handle(s) for benchtop use.

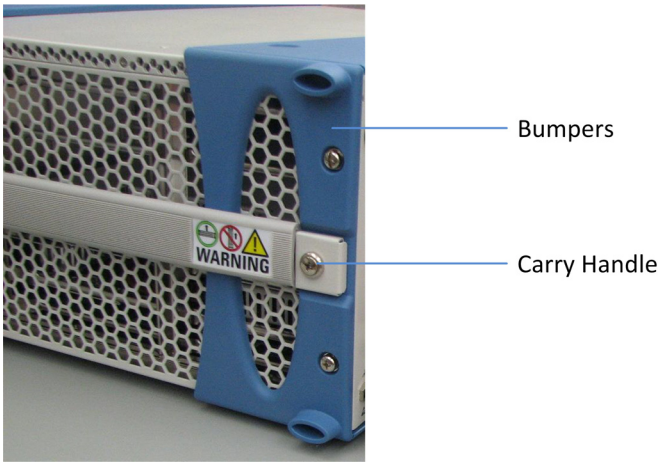


Figure 23 Chassis bumpers and carry handles

Benchtop Configuration with Support Assembly

If you want to install the M8061-64761 support AXIe chassis to support an oscilloscope placed on top of the M8020A:

1 Place the M8061- 64761 on top of the M8020A as shown in Figure 24 on page -37.

Figure 24 M8061-64761 support assembly

2 Attach the assembly to the top of the M8020A with screws provided as shown in Figure 24 on page -37.

Rack Mounted Configuration

If you want to use the M8020A in a rack mounted configuration:

1 Remove the bumpers and carry handle(s) from the chassis. The procedure and tools needed to remove these is documented in the Keysight M9502A/M9505A AXIe Chassis User's Guide which is available on www.keysight.com.

2 Attach the rack mount brackets to the chassis and mount onto a rack. The rack mount brackets are available in the Keysight rack mount kit that you can order for the chassis. Refer to this kit for rack mounting instructions.

Installing the AXIe Embedded Controller Module

If you plan to use the Keysight M9536A Embedded Controller as the host computer, then:

1 Install this module in slot 1 of the M9505A AXIe Chassis.

NOTE This module must be installed in slot 1 of the M9505A AXIe Chassis.

2 Connect the keyboard, mouse, and monitor to various ports available on the front panel of the M9536A Embedded Controller.

3 If needed, connect the M9536A Embedded Controller to LAN using the Gbe LAN port on the front panel of this module. You need Internet connectivity later to perform firmware upgrades, download instrument module control software, or the latest Keysight I/O libraries suite.

NOTE Do not use the ESM LAN port as the remote control port. Use the LAN port of the controller (on M9536A or external PC).

NOTE You do not need to manually establish any external PCIe/USB or LAN connection between the M9536A AXIe Embedded Controller and M8020A because this controller communicates with the ESM through the chassis backplane.

You do not need to manually install any operating system or drivers for this module. The Windows 7 (64 bit) operating system is pre-installed based on your choice and the module is ready to use as the host computer.

The following figure displays the M9536A Embedded Controller installed in slot 1 of the M9505A AXIe Chassis.

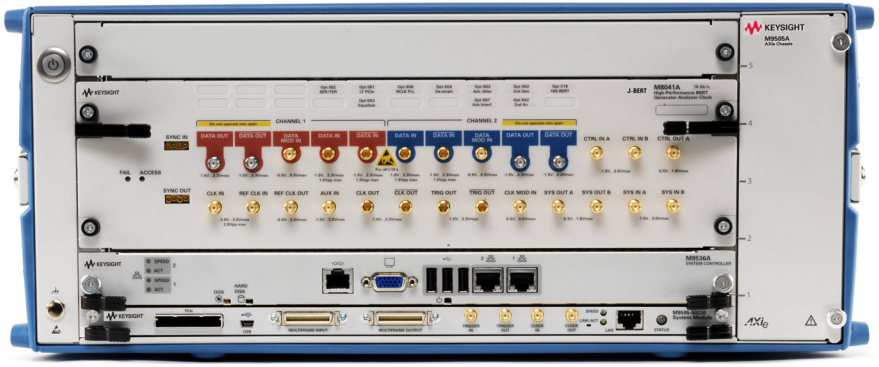


Figure 25 M9536A embedded controller with M8041A

Detailed information and user guide for the M9536A Embedded Controller module is available at www.keysight.com/find/M9536A.

NOTE The M9536A Embedded Controller module will successfully connect with M8020A only when installed in slot 1 of the M9505A chassis. Make sure that you install the module in the M8020A before powering up the complete setup.

NOTE You should not connect the M8020A to multiple operating host computers at the same time. If you plan to use the M9536A AXIe Embedded Controller as the host computer, then do not connect an external host computer to the M8020A.

Completing the Installation and Setup Process

Refer to the *Keysight M8020A and M8030A Getting Started Guide* for procedures required to complete the installation and setup process.

The *Keysight M8020A and M8030A Getting Started Guide* contains procedures for the following:

- Set up an external host computer
- Connect power
- Power up the system
- Verify basic operation
- Install Keysight IO Libraries Suite
- Install M8070A software
- Install M8070A license
- Install module licenses (for onsite upgrades only)

The *Keysight M8020A and M8030A Getting Started Guide* also contains the following information:

- Transporting M8070A licenses
- Connecting the M8020A to a DUT
- Starting the M8070A software interface
- Making a basic measurement

Detailed information, consisting of user guide and other documents, for the Keysight M8020A is available at www.keysight.com/find/M8020A.

Setting up the M8030A

The AXIe chassis accepts modules conforming to the single slot, 1U AXIe standard. These include:

- AXIe instrument modules
- AXIe System Module (ASM)
- AXIe filler panels

NOTE The procedure described in this section is not required in case of a bundled system wherein modules are pre-installed.

If the M9514A AXIe chassis and M8030A module(s) come in separate shipments, please go through this section which shows how to carefully insert a module in an empty slot of an M9514A AXIe chassis. The slots are identified by the slot numbers written on the front panel of the chassis.

NOTE Slot 1 is reserved for M9536A AXIe Embedded Controller.

CAUTION The instrument modules are not hot swappable. You must power down the AXIe chassis and host PC before inserting, replacing, or removing a module. The enclosure surface of the instrument module may become hot during use. If you need to remove the module, first power down the AXIe chassis, allow the module to cool, and then pull the module out of the chassis.

CAUTION

Static Electricity–The components and connectors on modules are sensitive to static electricity. To minimize electrostatic damage, take the necessary anti-static precautions. The chassis provides a grounding terminal to connect a wrist strap. To locate this terminal, see Figure 26 on page -43.

Empty Slots–Except for performing initial chassis verification or troubleshooting, do not operate the chassis with empty slots.

Always insert a filler panel or an instrument module into empty slots. This is especially important for the slots on either side of an instrument module. This allows proper air flow and cooling, and provides EMI shielding for the chassis and installed components.

Leaving slots empty can increase fan speed, raise ambient noise, overheat components, and shut down modules.

ASM–The AXIe System Module is integral to the operation of the chassis. Except for troubleshooting purposes, do not remove it.

Hot Swap–AXIe does not explicitly support hot swap for instrument modules. Keysight recommends fully powering down the chassis before installing or removing modules.

AXIe System Module–Shutdown of the controller operating system and power off the chassis before removing.

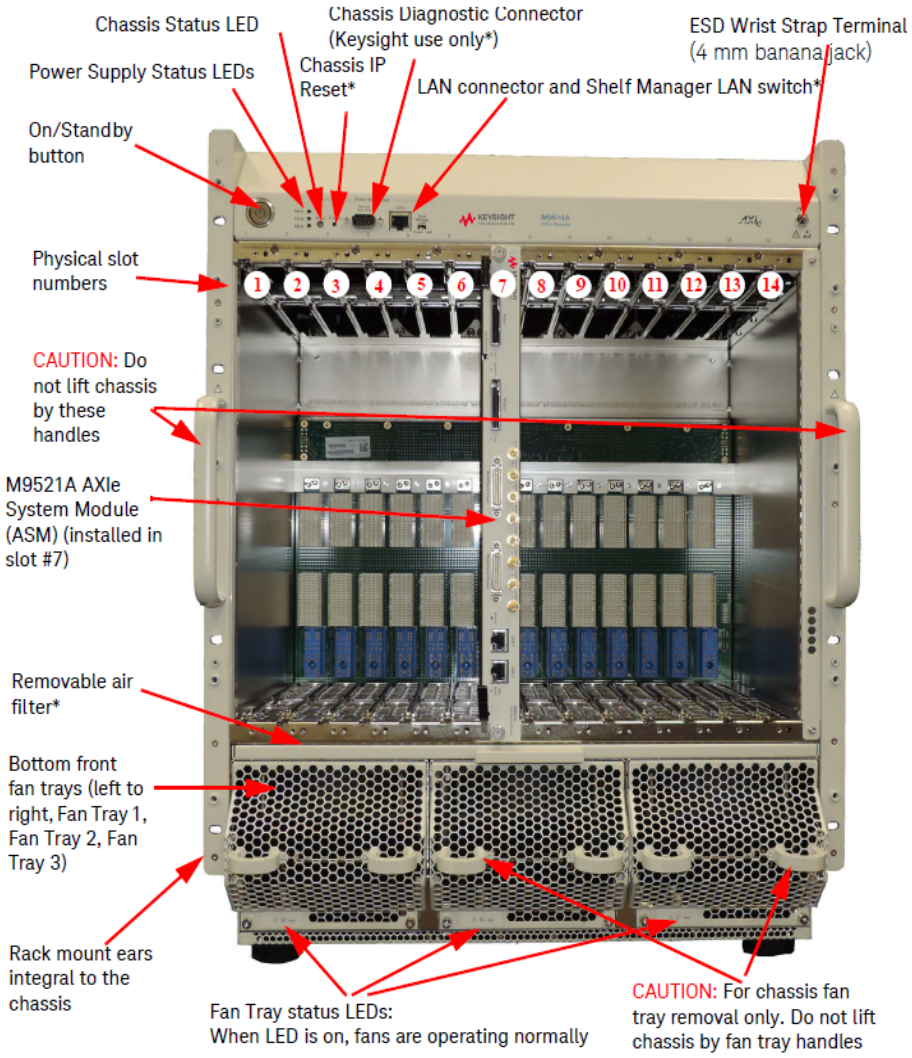


Figure 26 M9514A AXIe 14-slot chassis at a glance

Detailed information, consisting of user guide and other documents for the M9514A AXIe chassis is available at www.keysight.com/find/M9514A.

Removing Filler Panels

1 Power down the AXIe chassis.

2 Fully loosen the captive retaining screws on both sides of the filler panel.

CAUTION **Ensure you fully loosened the captive module retaining screws before trying to extract any module. If you attempt to pull the module out by the screws (for filler panels) or by using the extraction handles (other modules) with these screws still engaged, damage to the chassis or module could result.**

3 Grasp the panel by the two retaining screws, and slide it out of the chassis.

Installing the AXIe Embedded Controller Module

If you plan to use the Keysight M9536A Embedded Controller as the host computer, then:

1 Install this module in slot 1 of the M9514A AXIe chassis.

NOTE **This module must be installed in slot 1 of the M9514A AXIe chassis.**

2 Connect the keyboard, mouse, and monitor to various ports available on the front panel of the M9536A Embedded Controller.

3 If needed, connect the M9536A Embedded Controller to LAN using the Gbe LAN port on the front panel of this module. You need Internet connectivity later to perform firmware upgrades, download instrument module control software, or the latest Keysight I/O libraries suite.

NOTE **Do not use the ASM LAN port as the remote control port. Use the LAN port of the controller (on M9536A or external PC).**

NOTE

You do not need to manually establish any external PCIe/USB or LAN connection between the M9536A AXIe Embedded Controller and M8020A because this controller communicates with the ASM through the chassis backplane.

You do not need to manually install any operating system or drivers for this module. The Windows 7 (64 bit) operating system is pre-installed based on your choice, and the module is ready to be used as the host computer.

The following figure displays the M9536A Embedded Controller installed in slot 1 of the M9514A AXIe Chassis.

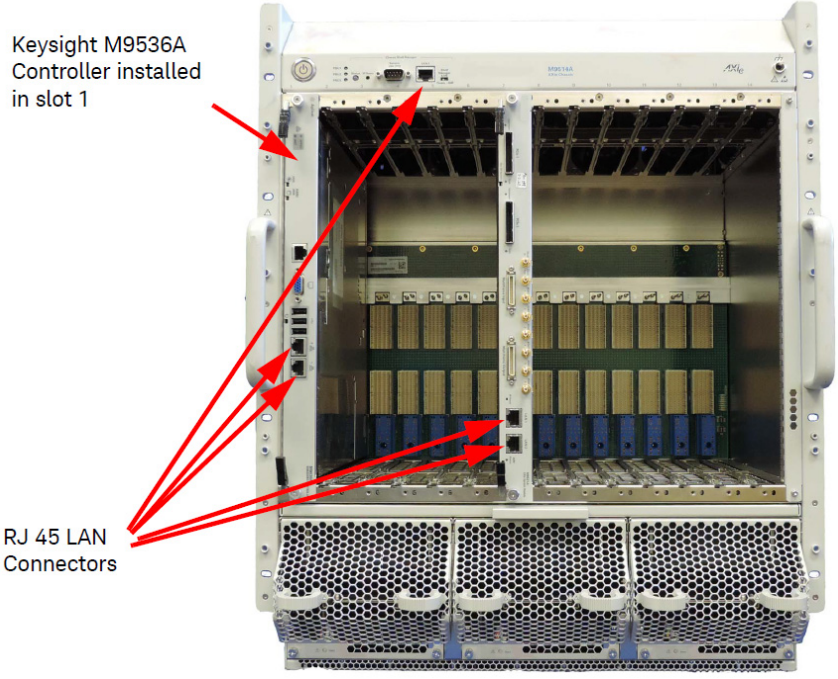


Figure 27 M9536A embedded controller installed in M9514A AXIe chassis

Detailed information, consisting of user guide and other documents, for the M9536A Embedded Controller module is available at www.keysight.com/find/M9536A.

NOTE The M9536A Embedded Controller module will successfully connect with M8030A only when installed in slot 1 of the M9514A chassis. Make sure that you install the module in the M8030A before powering up the complete setup.

NOTE You should not connect the M8030A to multiple operating host computers at the same time. If you plan to use the M9536A AXIe Embedded Controller as the host computer, then do not connect an external host computer to the M8030A.

Installing a Module

1 Power down the AXIe chassis.

2 Locate the (top and bottom) guide rails for each slot. The example below shows the guide rails in the chassis with all slots empty; typically one or more will be covered.

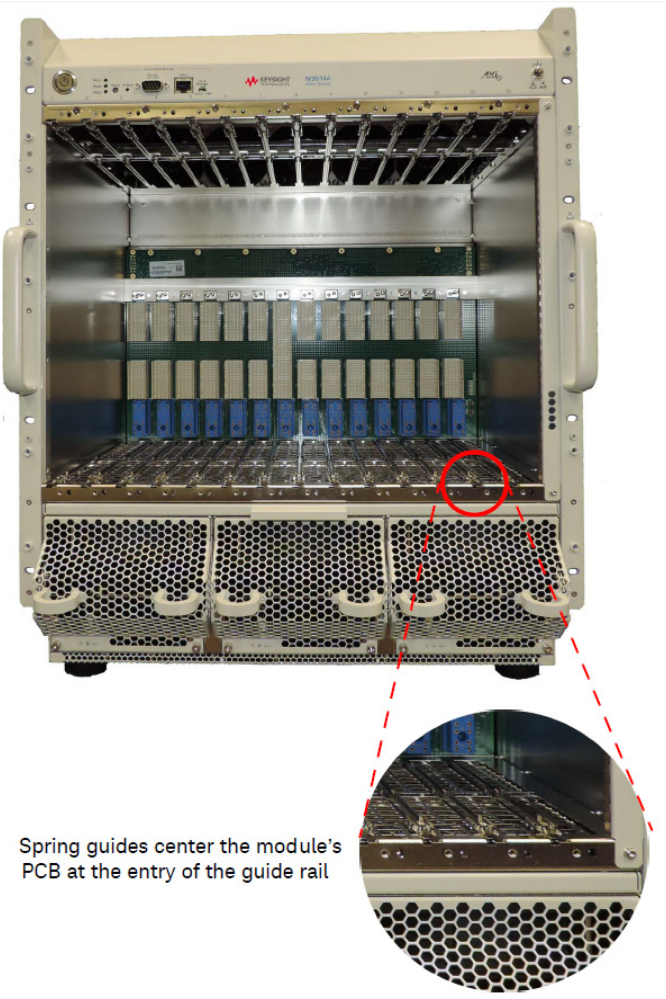


Figure 28 Guide rails in the chassis with all slots empty

3 Align the module's circuit board with the chassis guide rails. If the module has metal plates covering the board, be sure to insert the circuit board and not the metal plates into the rails. Slide the board gently into the two rails. If the fit is tight, slide the board back out and recheck alignment.

4 Locate the insertion/extraction handles at each side of the module's front panel. Extend the ends of both handles, by pulling them inwards towards each other; the plastic handle end slides about 1 cm on the metal handle shaft.Then fully open the handles by pivoting them out towards you until they are perpendicular to the front panel. The left handle is shown below, from the top view, correctly extended.

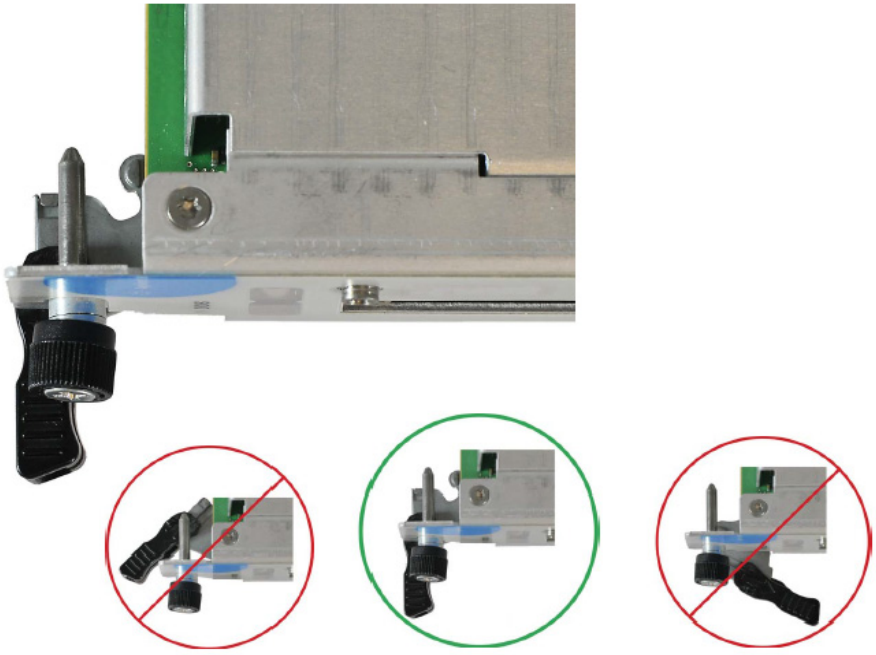


Figure 29 Top view of left handle

If either handle is misaligned, you will not be able to properly install the module.

5 Slide the module completely into the chassis. When the module's backplane connectors contact the chassis backplane, you will feel resistance and the two handles will begin to close toward each other. The module's faceplate will be about 1 cm from the chassis front panel.

6 Continue nudging the module faceplate gently but firmly with your thumbs, until the handles are pressed up against the chassis and the module's front panel lies flush with the chassis' front panel. This seats the module firmly in the chassis backplane. If necessary, gently press inward (toward the chassis) on the handles to ensure full insertion.

7 Tighten the captive retaining screws at both sides of the module.

CAUTION Modules are grounded through the chassis. Tighten the module retaining screws to ensure a proper ground connection.

8 Retract the handle ends by sliding them outward on their metal shafts, away from each other, toward the chassis edge; this secures them out of the way of test connections.

9 Repeat steps 3 through 8 for additional modules, as needed. Ensure that each slot has an instrument module or filler panel installed.

10 Power up the AXIe chassis. Verify that the chassis fans are operating and free of obstructions that may restrict airflow.

NOTE Do not operate the chassis without filler panels in empty slots. This is especially important for the slots on either side of the instrument module. This allows proper air flow and cooling, and provides EMI shielding for the chassis and installed components. Leaving slots empty can increase fan speed, raise ambient noise, overheat components, and can cause the module to shut down.

Removing a Module

The instructions below apply to all module types. The AXIe System Module (ASM) has the same extraction handles and retaining screws as instrument modules. If you should ever have to remove the ASM, follow the instructions for instrument modules below.

1 Power down the AXIe chassis.

2 Fully loosen the captive retaining screws on both sides of the module.

CAUTION **Ensure you fully loosened the captive module retaining screws before trying to extract any module. If you attempt to pull the module out by the screws (for filler panels) or by using the extraction handles (other modules) with these screws still engaged, damage to the chassis or module could result.**

3 For a filler panel, grasp the panel by the two captive retaining screws, and slide it out of the chassis. For all other modules, locate the insertion/extraction handles at each side of the module's front panel. Extend the plastic ends of both handles by sliding them outward on their metal handle shafts, inwards towards each other.

4 Open the handles by pivoting them out towards you, away from the chassis. This is easiest to do with thumb and forefinger of both hands simultaneously. Place each thumb at the inside of the handle, forefinger outside the handle, and rotate the handles with your thumbs. When the handles are perpendicular with the chassis, stop. The module should now be unseated the module from the chassis backplane and its faceplate from the chassis front panel.

5 Grasp the levers to slide the module out of the chassis.

Synchronization Cable Configuration

This configuration requires 5 cables (provided with the M8030A), one of them connects the M8041A SYNC OUT to the M8192A SYNC IN and rest four connect M8192A SYNC OUT to the individual SYNC IN ports of the four M8051A modules in order to synchronize the six modules to a common system clock.

Figure 30 Cross-wired synchronization cable M8041-61614

Route the synchronization cable as shown in the following figure.

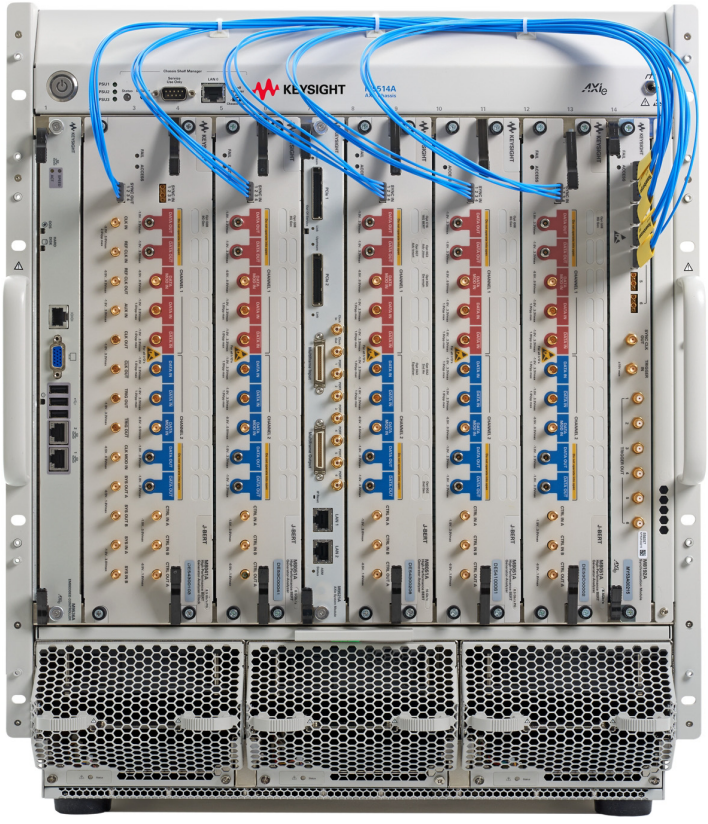


Figure 31 Synchronization cable routing

NOTE While connecting a module which requires the sync cable connection (e.g. M8051A, M8062A) to the test setup, make sure to connect the sync cable after completing the other connections and also remove the sync cable first while disconnecting the connections.

Completing the Installation and Setup Process

Refer to the *Keysight M8020A and M8030A Getting Started Guide* for procedures required to complete the installation and setup process.

The *Keysight M8020A and M8030A Getting Started Guide* contains procedures for the following:

- Set up an external host computer
- Power up and power down the system
- Verify basic operation
- Install Keysight IO Libraries Suite
- Install M8070A software
- Install M8070A license
- Install module licenses (for on-site upgrades only)

The *Keysight M8020A and M8030A Getting Started Guide* also contains the following information:

- Transporting M8070A licenses
- Starting the M8070A software interface
- Making a basic measurement

Detailed information, consisting of user guide and other documents, for the Keysight M8030A is available at www.keysight.com/find/M8030A.

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