

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

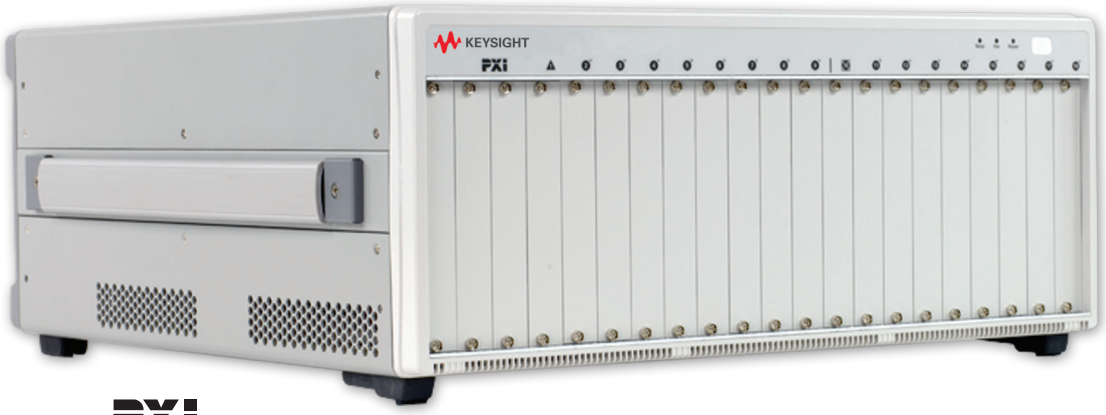
Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Keysight / Agilent M9018A* at our website: ***Click HERE***

Keysight Technologies
M9018A PXIe Chassis
18-slots, 3U, 8GB/s

Data Sheet



PXI

KEYSIGHT TECHNOLOGIES

Introduction

Product Description

The Keysight Technologies, Inc. M9018A PXIe chassis delivers the ultimate in flexibility, compatibility, and performance. With 16 PXIe hybrid slots, it allows the system designer to mix and match the number and location of PXIe and hybrid-compatible modules. The advanced PCIe® switch fabric can operate up to Gen 2 speeds, and is compatible with most PXIe controllers. The innovative cooling design allows the chassis to fit into 4U of rack space, in most cases. When combined with the latest 1U rack-mounted computer, you can build a powerful system using only 5U of rack space.

Applications

- Aerospace and defense
- Communications
- Electronics test
- Semiconductor testing



Features

- 16 PXIe hybrid slots, 1 PXIe timing slot, and 1 PXIe system slot
- 4U chassis with innovative cooling design
- High data bandwidth (maximum 8 GB/s to system slot and 4 GB/s slot-to-slot)
- Advanced Gen 2 PCIe switching with four x8 links and 12 x 4 links to the hybrid slots
- Configurable PXIe system slot

Customer Values

- All slots are hybrid-compatible, providing complete flexibility in module placement
- Advanced PCIe switching enables high-performance applications, and ensures compatibility with most embedded controllers
- The innovative cooling design saves rack space and lowers maintenance costs
- Up to 867 watts of power supports most application requirements

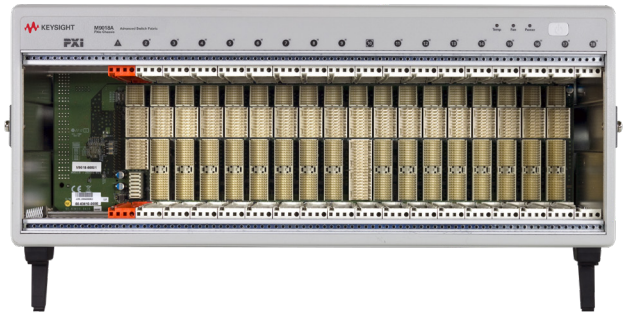


Figure 1. 18-slot PXIe backplane

Hardware Platform

Compliance

The M9018A chassis is fully compliant with the PXI Express specification. Each hybrid-compatible slot accepts PXIe, hybrid-compatible, and 32-bit cPCI/PXI-1 modules (without J2 connector). PXI-1 modules with both J1 and J2 connectors must be converted to hybrid format to be compatible. The PXIe system timing slot accepts either a PXIe timing module or a PXIe peripheral module. The system slot accepts a PXIe controller up to 4 slots wide.

Backplane configuration

The Keysight M9018A chassis provides 16 hybrid-compatible slots for the ultimate in flexibility and compatibility. This capability allows the system designer to mix and match the number and location of PXIe and hybrid-compatible modules. The hybrid slots are broken into two segments, each serviced by its own PCIe to PCI bridge.

The hybrid slots are organized into three trigger bus segments with configurable interconnections between segments.

The system slot has a flexible link configuration that can be configured for most PXIe controllers, whether embedded or external. Both 2-link (2x8) and 4-link (4x4) configurations are available. A 2-link configuration optimized for the M9021A is also provided (a 2x8, 2-link configuration, with link 2 inactive).

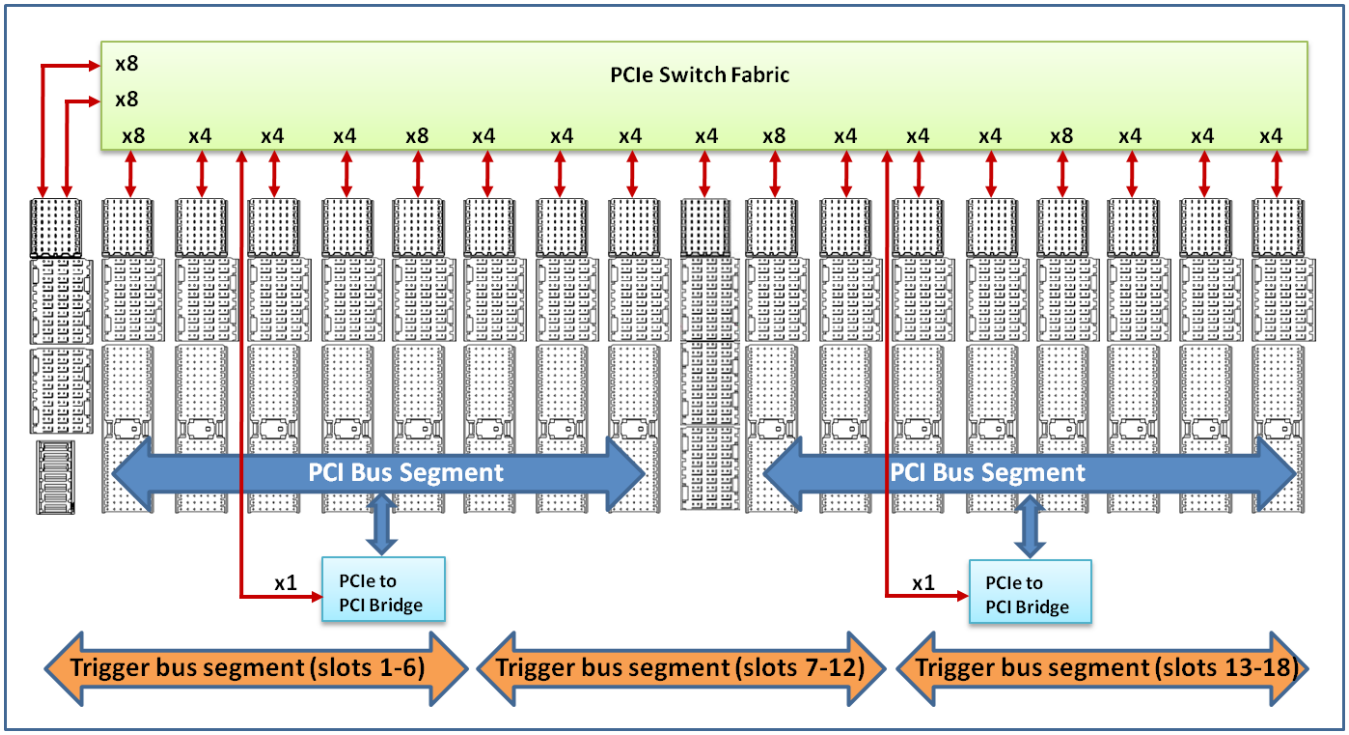


Figure 2. M9018A backplane block diagram

Advanced PCIe Switching

The Keysight M9018A contains an advanced PCIe switch fabric that operates at up to Gen 2 speeds. Four of the PXIe peripheral slots have a x8 PCIe link providing a maximum data bandwidth of 4 GB/s. The 12 remaining peripheral slots have a x4 PCIe link providing a maximum data bandwidth of 2 GB/s. The system slot has a maximum data bandwidth of 8 GB/s when all 16 PCIe lanes are utilized.

The advanced switch fabric also allows for peer-to-peer communications. Any peripheral slot can communicate with any other peripheral slot without utilizing the system slot PCIe links. The PCIe switches have a large crossbar capacity, allowing flexible placement of peer-to-peer modules without impacting data bandwidth.

Innovative Cooling

The M9018A chassis has an innovative cooling design that allows it to fit into 4U of rack space. This represents a 20 percent reduction in occupied rack space, considering most PXI chassis require 5U or more for air-flow. This space can be utilized for an external 1U controller via PCIe cable, resulting in a system that requires no more rack space than other chassis with an embedded PC controller.

The innovative cooling design uses auto-speed fans to expel hot air out the back rather than the top. This allows other instruments with bottom air intakes to be placed directly above the chassis. In addition, cool air is pulled into the chassis from multiple locations, including the front, sides, and bottom of the chassis. Keysight-exclusive “air-inlet” modules can also be used to supply more cool air from the front of the chassis, so the air is directed to the other slots. These features allow the system designer to decide how to best cool the chassis, providing more design flexibility than other PXIe chassis.



Figure 3. Y1214A Air Inlet Kit

Lower Maintenance Costs

The Keysight M9018A was designed to reduce maintenance costs. The innovative air-flow design does not require air filters to maintain. In addition, the power supply and fans can be removed while the chassis is mounted in a rack, allowing the chassis to be serviced, while keeping DUT cabling and modules in place.

System Monitoring

The Keysight M9018A has a complete set of system monitoring functions for power rail voltages, module exhaust temperatures, and fan speeds. For temperature measurements, the chassis utilizes eight temperature sensors located on the top of the backplane, in the path of the module exhaust. Module exhaust temperatures and power rail voltages can be monitored via a software API or the soft front panel interface. A DB-9 connector is also available at the rear of the chassis for remote inhibit and power rail monitoring.

The chassis has configurable alarms that can be monitored via front panel LEDs, soft front panel interface, or software API.

Software Platform

Drivers

The M9018A chassis comes complete with IVI-COM, IVI-C, and LabVIEW drivers. Windows XP, Windows Vista, and Windows 7 operating systems are supported, and applications can be completed using a variety of software tools including LabVIEW, LabWindows/CVI, MATLAB, VEE, Visual Basic, VisualStudio.NET (C/C++, C#, VB.NET).

Soft front panel interface

A soft front panel interface is provided to monitor and control the PXIe chassis with the following functions:

- Trigger configuration
- Chassis fan speed, temperatures, and rail voltage monitoring
- Alarms for fan speed, temperature, and rail voltage
- Chassis information

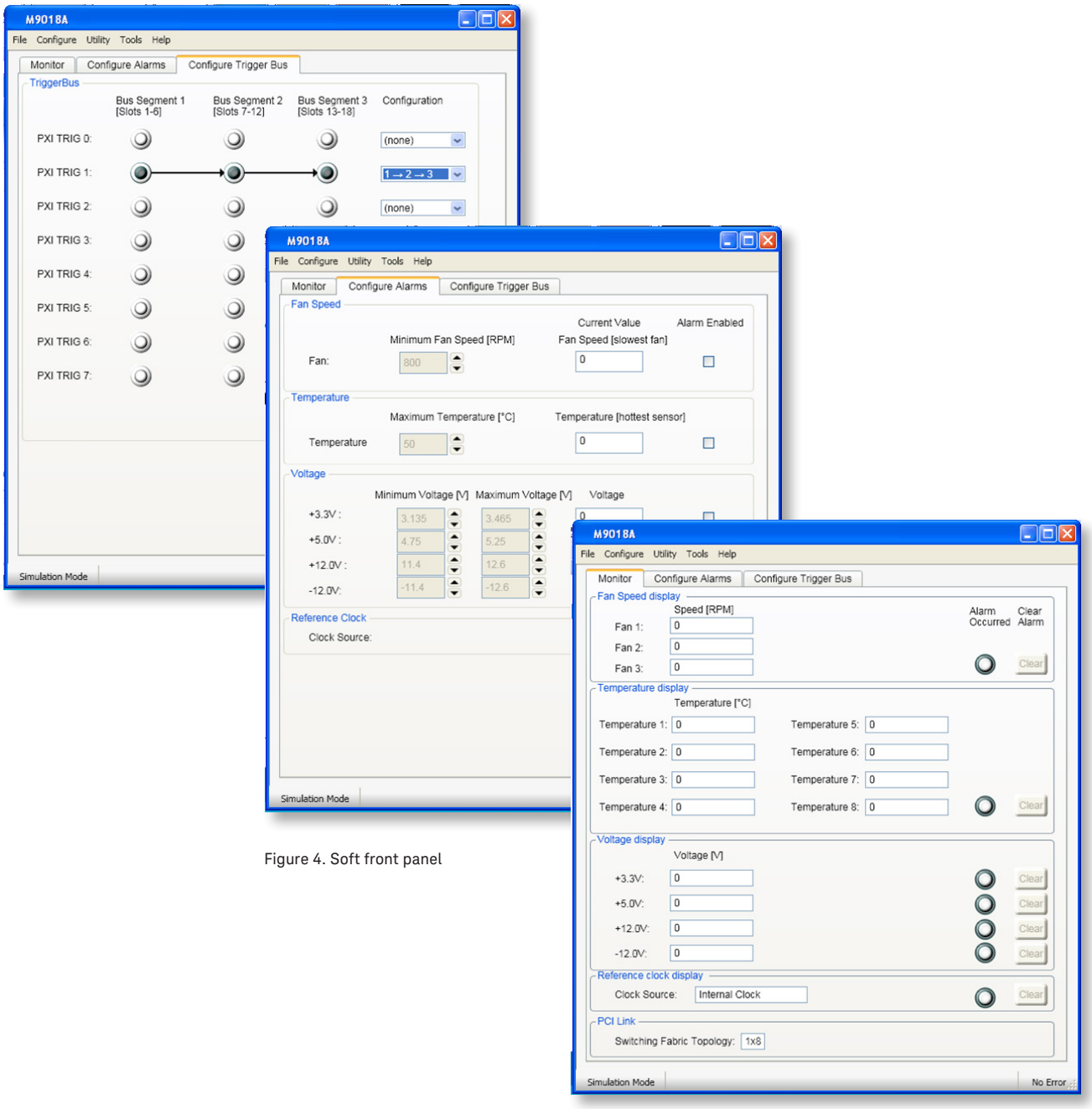


Figure 4. Soft front panel

Technical Specifications

Chassis characteristics	
Standards compliance	
PXI-5 PXI Express hardware specification	
PXI-1 hardware specification Rev 2.2	
PICMG EXP.0 R1.0 specification	
Backplane	
Module size	3U
Total slots	18
Hybrid compatible slots	16
PXIe system slot	1 (with three system expansion slots)
PXIe timing slot	1 (also accepts PXIe module)
Module compatibility	PXIe, PXI-hybrid, PXI-1 (J1-only), and cPCI (J1-only)
Mechanical	
Size	444.4 mm W x 191.8 mm H x 466 mm D (with feet installed)
	444.4 mm W x 177.8 mm H x 466 mm D (with feet removed)
	4U x 1 rack width
Weight (without modules)	15.5 kg (34 lbs)

Power supply characteristics	
AC input	
Operating voltage/power (low-line) Operating voltage/power (high-line)	100-120V, 1000 W (***nominal***) 220-240V, 1200 W (***nominal***)
Input frequency range	50/60 Hz
Overcurrent protection	Internal fuse in line
DC output power	
Total DC power [1]	
220-240 Vac input	867.5 W
100-120 Vac input	717.5 W

1. Includes $5V_{AUX}$ supply (7.5 W)



Technical Specifications

Power supply characteristics, continued			
DC supplies (220-240 Vac input)			
Voltage	Maximum current[1]	Load regulation	Maximum ripple and noise (20 MHz BW)
+3.3 V	60 A[2]	1%	1.5% (pk-pk)
+5 V	58.8 A	1%	1% (pk-pk)
+12 V	51.3 A[2]	1%	1% (pk-pk)
-12 V	4 A[2]	1%	1% (pk-pk)
5 VAUX	1.5 A	1%	50 mV (pk-pk)
DC supplies (100-120 Vac input)			
The maximum current from each supply rail is the same for both low-line and high-line inputs, however, the total power supplied for all rails (except 5 VAUX) must not exceed 710 W on lowline (100-120 Vac input).			

PXI Express backplane continuous current capacity					
Slot	+3.3 V	+5 V	+12 V	–12 V	5 VAUX
System controller slot	9 A	9 A	11 A	0 A	1 A
System timing/PXIe slot	6 A	0 A	4 A	0 A	1 A
PXIe hybrid slot	6 A	6 A	4 A	1 A	1 A

1. The total power supplied for all rails (except 5VAUX) must not exceed 860 W.
2. The total power supplied for 3.3V, 12 V, and –12 V rails must not exceed 616 W.

Chassis cooling and power dissipation characteristics	
Slot airflow direction	Bottom of module to top of module
Chassis cooling intake	Bottom of front bezal, side panels, and bottom panel of chassis
Chassis cooling exhaust	Rear of chassis
Chassis cooling fans	Three 186 cfm fans on rear panel with HIGH/AUTO speed selector
Power dissipation, system slot	140 W max
Power dissipation, user slot	42 W max [1]
Power dissipation, timing slot	42 W max [1]

1. Maximum per slot power dissipation at 55° C with 15° C temperature rise; requires: a) that the chassis bottom not be blocked (1U rack space below the chassis or feet extended), or b) two air inlet modules in slots 9, 10, or 11, and a slot blocker in empty controller slots. Module cooling can be impacted by each module's resistance to air flow.

Technical Specifications

Clocks and triggers	
10 MHz system clock (PXI_CLK10)	
Maximum slot-to-slot skew	155 ps
Accuracy	25 ppm
Output amplitude (10 MHz REF Out BNC)	1 Vpk-pk ±20% square-wave into 50 Ω 2 Vpk-pk unloaded
Output impedance (10 MHz REF Out BNC)	50 Ω ±5 Ω
100 MHz system clock (PXIe_CLK100)	
Maximum slot-to-slot skew	120 ps
Accuracy	25 ppm
External 10 MHz clock source input requirements	
Frequency input	10 MHz ±100 PPM
Input signal (10 MHz REF In BNC)	100 mVPP to 5 VPP (square-wave or sine-wave)
Input impedance (10 MHz REF In BNC)	50 Ω ±5 Ω
Input signal (PXI timing slot PXI_CLK10_IN)	5 V or 3.3 V TTL signal
PXI star trigger	
Maximum slot-to-slot skew	250 ps
PXI differential star triggers	
Maximum slot-to-slot skew	150 ps
Maximum differential skew	25 ps

Environmental characteristics [1,2]		
Operating and storage conditions		
Humidity	Type tested at 95%, +40°C (non-condensing)	
	Operating	Storage
Temperature	0°C to 55°C	–40°C to 70°C
Altitude	Up to 10,000 ft (3048m)	Up to 15,000 ft (4572m)
Vibration		
Operating random vibration	Type-tested at 5 to 500 Hz, 0.21 g rms	
Survival random vibration	Type-tested at 5 to 500 Hz, 2.09 g rms	
Acoustical emissions (referenced to 1pW)		
	Auto fan (25°C ambient)	High fan
Sound pressure level [3]	53 dBA	69 dBA
Sound power	59 dBA	77 dBA

1. 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.

2. Test methods are aligned with IEC 60068-2 and levels are similar to MIL-PRF-28800F class 3.

3. At operator position.

Technical Specifications

Regulatory characteristics	
Safety	
German acoustic statement	
Acoustic noise emission LpA <70 dB Operator position Normal position Per ISO 7779	Geraeuschemission LpA <70 dB Am Arbeitsplatz Normaler Betrieb Nach DIN 45635 t.19
EMC	
Complies with European EMC Directive 2004/108/EC	
– 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 à la norme NMB-001 du Canada	

M9018A Rack Mounting

The M9018A rack mount accessory kits provide system design flexibility. The following kits can be mix-and-matched to suit the needs of a given application:

- Y1215B Flush Mount Rack Kit: Complete kit including rack flanges, handles, and attachment hardware. Suspends the M9018A chassis in a Keysight rack using only 4U of rack space. Rack rails may be needed in a non-Keysight rack.
- Y1216A Recess Mount Rack Kit: Complete recess-mount kit including rack flanges, handles, and attachment hardware. Recesses the M9018A chassis by 4 inches and suspends the chassis in a Keysight rack using only 4U of rack space. Rack rails may be needed in a non-Keysight rack.
- Y1217A Rack Mount Rail Kit: This optional kit provides additional stability to the M9018A when rack-mounted. When using rails, the chassis will require 5U of rack space. Rails may not fit in a non-Keysight rack.
- Y1218A Cable Tray Kit: Adds a 1U high cable tray to the M9018A chassis and includes cable tray, feet for using the chassis/tray on a table, and attachment hardware.

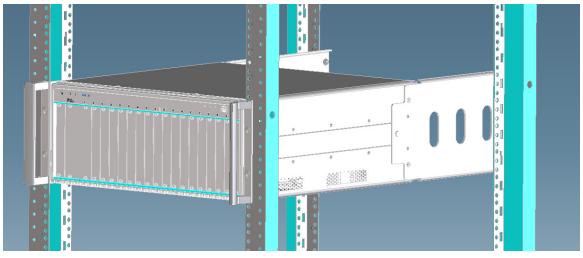


Figure 5. M9018A chassis suspended in a rack using the Y1215B.

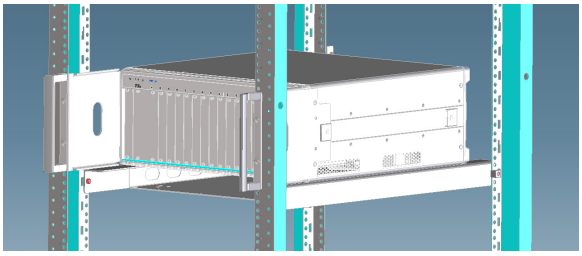


Figure 6. M9018A chassis rack-mounted using the Y1216A, Y1217A, and Y1218A.

Note: Rack mounting the M9018A may require two people if rails are not used. Care must also be taken to ensure the M9018A receives sufficient cooling air. See the chassis cooling characteristics in this data sheet for more details.

Recommended Configuration

Configure the Keysight M9018A PXIe chassis as follows:

- Select a PXIe system module, PCIe cable interface, or embedded controller (the Keysight M9021A and M9036A are recommended)
- If an external computer is being used, select an appropriate PC interface card (the Keysight M9048A is recommended)
- Select an appropriate cable to connect the computer interface board to the chassis interface (the Y1202A is recommended to connect the M9048A and M9021A)
- Select accessories as required

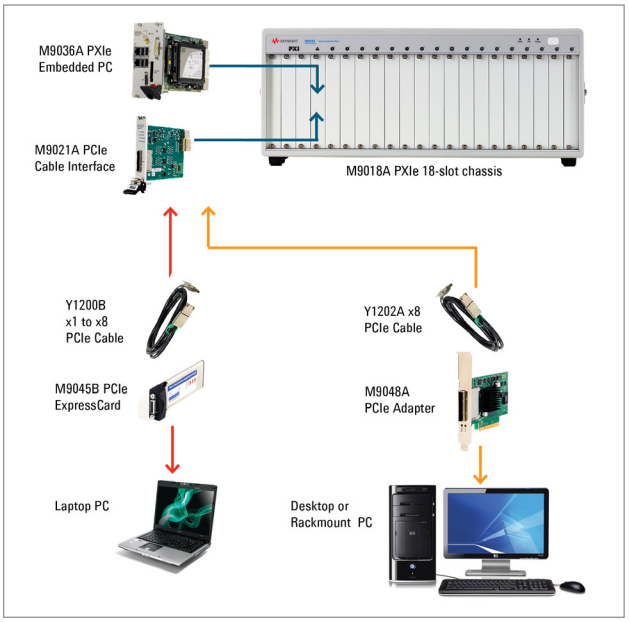


Figure 7. Configuration

Multi-Chassis Configuration

The M9021A can be used with the M9018A PXIe Chassis to build multi-chassis systems. Up to four chassis can be connected together depending on the controller and operating system used. Many different topologies are possible including cascade and star. Two examples are shown at right.

The M9502A/M9505A AXIe Chassis can be linked to a M9018A PXIe Chassis in a star configuration or as the last chassis in a cascade configuration. For more detailed configuration information, see: **www.keysight.com/find/pxie-multichassis**

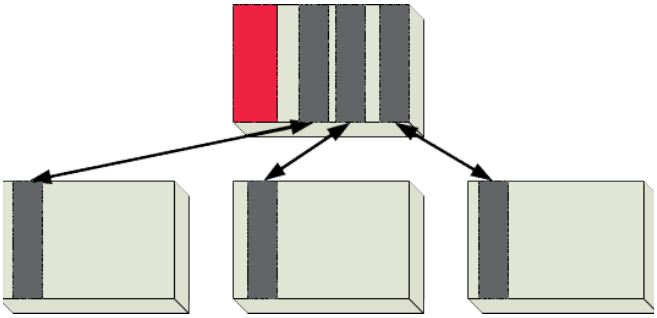


Figure 8. Star configuration with M9036A Embedded Controller and M9021A PCIe interface

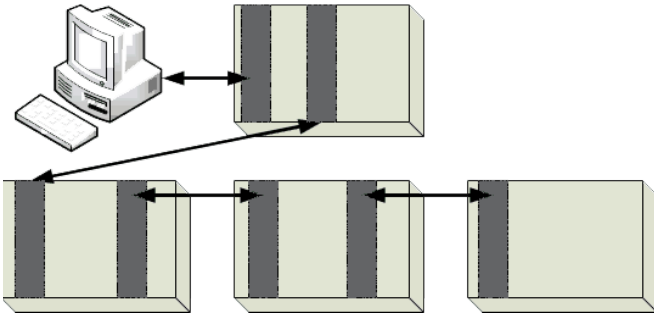


Figure 9. Cascade configuration with External Controller and M9021A PCIe interface

Hardware

Model	Description
M9018A	PXIe chassis
Includes:	Standard PXI filler panels, getting started guide, drivers, and Keysight I/O libraries

Accessories

Model	Description
Y1212A	Slot blocker kit: 5 single-slot
Y1213A	PXI EMC filler panel kit: 5 single-slot
Y1214A	Air inlet module kit (includes controller slot blocker)
Y1215B	Flush mount rack kit
Y1216A	Recess mount rack kit
Y1217A	Rack mount rail kit
Y1218A	Cable tray kit

Related Products

Model	Description
M9021A	PCIe cable interface: Gen 2, x8
M9036A	Embedded PXIe PC controller
M9045B	PCIe ExpressCard adapter: Gen 1
Y1200B	PCIe cable: x1 to x8, 2.0m (used with M9045B)
M9048A	PCIe desktop PC adapter: Gen 2, x8
Y1202A	PCIe cable: x8, 2.0m (used with M9047A)

Software

Model	Description
Supported operating systems	Microsoft Windows XP (32-bit), Microsoft Windows Vista (32/64-bit), Microsoft Windows 7 (32/64-bit)
Standard compliant drivers	IVI-COM, IVI-C, LabVIEW
Supported application development environments (ADE)	VisualStudio (VB.NET, C#, C/C++), LabVIEW, LabWindows/CVI, VEE
Keysight IO Libraries	Includes: VISA Libraries, Keysight Connection Expert, IO Monitor

Ordering

Model	Description
M9018A	PXIe chassis: 18-slot, 3U, 8GB/s
Opt 900-932	Power cord options

Definitions for Specifications

Specifications describe the warranted performance of calibrated instruments that have been stored for a of minimum of 2 hours within the operating temperature range 0 to 55°C, unless otherwise stated, and after a 45 minute warm-up period. Data represented in this document are specifications unless other wise noted.

Characteristics describe product performance that is useful in the application of the product. Characteristics are often referred to as Typical or Nominal values.

- Typical describes characteristic performance, which 80% of the instruments will meet when operated over
- a 20 to 30°C temperature range. Typical performance
- is not warranted.
- Nominal describes representative performance that is
- useful in the application of the product when operated over a 20 to 30°C temperature range. Nominal performance is not warranted.

Note: All graphs contain measured data from several units at room temperature unless otherwise noted.

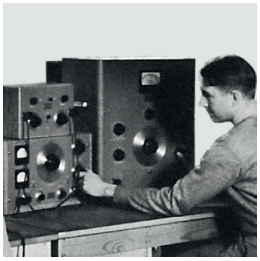
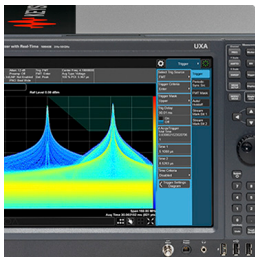
Calibration

Advantage Services: Calibration
Keysight Advantage Services is committed to your success throughout your equipment's lifetime.

1. Options not available in all countries.

Evolving Since 1939

Our unique combination of hardware, software, services, and people can help you reach your next breakthrough. We are unlocking the future of technology.
From Hewlett-Packard to Agilent to Keysight.


myKeysight

myKeysight
www.keysight.com/find/mykeysight
A personalized view into the information most relevant to you.

http://www.keysight.com/find/emt_product_registration
Register your products to get up-to-date product information and find warranty information.

KEYSIGHT SERVICES
Accelerate Technology Adoption.
Lower costs.

Keysight Services
www.keysight.com/find/service
Keysight Services can help from acquisition to renewal across your instrument's lifecycle. Our comprehensive service offerings—one-stop calibration, repair, asset management, technology refresh, consulting, training and more—helps you improve product quality and lower costs.

CALIBRATION UP TO 10 YEARS WARRANTY
ASSURANCE PLANS

Keysight Assurance Plans
www.keysight.com/find/AssurancePlans
Up to ten years of protection and no budgetary surprises to ensure your instruments are operating to specification, so you can rely on accurate measurements.

Keysight Channel Partners
www.keysight.com/find/channelpartners
Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

PCI-SIG®, PCIe® and the PCI Express® are US registered trademarks and/or service marks of PCI-SIG.
PICMG® and the PICMG logo are registered US trademarks of the PCI Industrial Computer Manufacturers Group.
CompactPCI® and the CompactPCI logo are registered US trademarks of the PCI Industrial Computer Manufacturers Group

www.keysight.com/find/pxi-chassis

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at:
www.keysight.com/find/contactus

Americas

Canada	(877) 894 4414
Brazil	55 11 3351 7010
Mexico	001 800 254 2440
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 11 2626
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Other AP Countries	(65) 6375 8100

Europe & Middle East

Austria	0800 001122
Belgium	0800 58580
Finland	0800 523252
France	0805 980333
Germany	0800 6270999
Ireland	1800 832700
Israel	1 809 343051
Italy	800 599100
Luxembourg	+32 800 58580
Netherlands	0800 0233200
Russia	8800 5009286
Spain	800 000154
Sweden	0200 882255
Switzerland	0800 805353 Opt. 1 (DE) Opt. 2 (FR) Opt. 3 (IT)
United Kingdom	0800 0260637

For other unlisted countries:
www.keysight.com/find/contactus
(BP-9-7-17)

DEKRA Certified
ISO9001 Quality Management System

www.keysight.com/go/quality
Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2015
Quality Management System

KEYSIGHT TECHNOLOGIES

This information is subject to change without notice.
© Keysight Technologies, 2017
Published in USA, December 2, 2017
5990-6583EN
www.keysight.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP