

Specification Guide

Keysight M9037A PXIe Embedded Controller



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Safety Information

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.

General

Do not use this product in any manner not specified by the manufacturer. The protective features of this product must not be impaired if it is used in a manner specified in the operation instructions.

Before Applying Power

Verify that all safety precautions are taken. Make all connections to the unit before applying power. Note the external markings described under "Safety Symbols".

Ground the Instrument

Keysight chassis' are provided with a grounding-type power plug. The instrument chassis and cover must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal 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 module/chassis in the presence of flammable gases or fumes.

Do Not Operate Near Flammable Liquids

Do not operate the module/chassis in the presence of flammable liquids or near containers of such liquids.

Cleaning

Clean the outside of the Keysight module/chassis with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.

Do Not Remove Instrument Cover

Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.

Keep away from live circuits

Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged equipment

Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to an Keysight Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.

DO NOT block the primary disconnect

The primary disconnect device is the appliance connector/power cord when a chassis used by itself, but when installed into a rack or system the disconnect may be impaired and must be considered part of the installation.

Do Not Modify the Instrument

Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Keysight Sales and Service Office to ensure that safety features are maintained.

In Case of Damage

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

CAUTION

Do NOT block vents and fan exhaust: To ensure adequate cooling and ventilation, leave a gap of at least 50mm (2") around vent holes on both sides of the chassis.

Do NOT operate with empty slots: To ensure proper cooling and avoid damaging equipment, fill each empty slot with an AXle filler panel module.

Do NOT stack free-standing chassis: Stacked chassis should be rack-mounted.

All modules are grounded through the chassis: During installation, tighten each module's retaining screws to secure the module to the chassis and to make the ground connection.

WARNING

Operator is responsible to maintain safe operating conditions. To ensure safe operating conditions, modules should not be operated beyond the full temperature range specified in the Environmental and physical specification. Exceeding safe operating conditions can result in shorter lifespan, improper module performance and user safety issues. When the modules are in use and operation within the specified full temperature range is not maintained, module surface temperatures may exceed safe handling conditions which can cause discomfort or burns if touched. In the event of a module exceeding the full temperature range, always allow the module to cool before touching or removing modules from the chassis.

Safety and Regulatory Symbols

CAUTION

A CAUTION denotes a hazard. It calls attention to an operating procedure or practice, 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 denotes a hazard. It calls attention to an operating procedure or practice, 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.

Products display the following symbols:



Warning, risk of electric shock



Refer to manual for additional safety information.



Earth Ground.



Chassis Ground.



Alternating Current (AC).



Standby Power. Unit is not completely disconnected from AC mains when switch is in standby.



Antistatic precautions should be taken.

CAT I
CAT II
CAT III
CAT IV

IEC Measurement Category I, II, III, or IV

For localized Safety Warnings, Refer to Keysight Safety document (p/n 9320-6792).



The CSA mark is a registered trademark of the Canadian Standards Association and indicates compliance to the standards laid out by them. Refer to the product Declaration of Conformity for details.



Notice for European Community: This product complies with the relevant European legal Directives: EMC Directive and Low Voltage Directive.



The Regulatory Compliance Mark (RCM) mark is a registered trademark. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.

ICES/NMB-001

ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001.

Cet appareil ISM est conforme a la norme NMB-001 du Canada.



This symbol represents 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 this product.



M9037A
MSIP-REM-Kst-xxxxx

South Korean Class A EMC Declaration. this equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라 며 , 가정외의 지역에서 사용하는 것을 목적으로 합니다.



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

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

Product Category: With reference to the equipment types in the WEEE directive Annex 1, this product is classified as a "Monitoring and Control instrumentation" product.

Do not dispose in domestic household waste.

To return unwanted products, contact your local Keysight office for more information.



Contents

- Technical Specification and Characteristics 9
- Recommended best practices in use. 9
- Additional information 9
- Software Information 12

M9037A PXIe Embedded Controller Specification Guide

This document contains technical specifications for all manufacturing versions of the M9037A PXIe Embedded Controller Module. Specifications published in the data sheet only apply to the current manufacturing version of the equipment.

If a specification only applies to a certain manufacturing version of the equipment, it is indicated in this document. Such changes are usually designated by a serial number break. For example, you might see a table indicating the specification for equipment with “Serial Number TW51150212 and earlier” accompanied with another column with “Serial Number TW51160201 and later.” indicating that the equipment with serial number TW51160201 and greater use the new specification.

Technical Specification and Characteristics

Specifications describe the warranted performance of calibrated instruments that have been stored for a minimum of 2 hours within the operating temperature range of 0 °C to 50 °C, unless otherwise stated and after a 45 minute warm-up period. Data represented in this document are specifications unless otherwise noted under the following conditions:

Characteristics describe product performance that is useful in application of the product, but that is not covered by the product warranty. Characteristics are often referred to as Typical or Nominal values.

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

Recommended best practices in use

- Use slot filler panels in empty module slots to ensure proper cooling. Keysight filler panels optimize module temperature performance and reliability of test.
- At environmental temperatures > 45 °C, chassis fans should be set to high.
- Please see the *Keysight PXIe Chassis Cooling Guidelines*
www.keysight.com/find/PXIeChassisCoolingGuidelines

Additional information

- All data is measured from multiple units at room temperature and are representative of product performance within the controlled temperature range unless otherwise noted.
- The specifications contained in this document are subject to change.

General Characteristics	
Controller characteristics	
CPU	Intel i7-4700EQ quad-core processor
CPU Threads	8
CPU Clock Frequency	2.4 GHz
Chipset	Intel QM87
Video Type Maximum Resolution	Integrated Intel graphics ¹ DP: 3840 x 2160 @ 60 Hz DVI: 1920 x 1200 @ 60 Hz DisplayPort adapters to other display standards are available on the market. Maximum resolution achieved is dependent on the adapter chosen
Memory Cache RAM Type RAM Capacity	6 MB Two DDR3 1600 204-pin SODIMM sockets 4 GB standard, 8 GB or 16 GB optional ²
Storage Type Size	2.5" SATA III 240 GB SSD
Operating System Support	Windows Embedded Standard 7 (32- and 64-bit) and Windows 10 Enterprise 2016 LTSB (64-bit)
Pre-loaded Software	Operating system, IVI trigger driver, Keysight I/O libraries, PXIe chassis driver, M950x AXIe chassis driver, and M9037A drivers

Mechanical Characteristics	
Dimensions	3U/4-slot PXI/CompactPCI standard
Chassis slot compatibility	PXIe system module slot (with three controller expansion slots)
Weight	1 kg (2.2 lbs)

1 VGA, DVI, and HDMI require adapters

2 32-bit Windows 7 can only access a maximum of 4 GB of memory (physical + virtual)

DC Power Requirements					
DC Supply	+3.3 V	5 V	+12 V	-12 V	+5 VAUX
DC current requirements (typ)	3.0A	2.1A	1.6 A	0	0.13 A
DC Current Requirements (max)	3.0A	3.9 A	5.3A	0	0.13 A
Power Dissipation (Idle/MAX)	40.6 W / 93.7 W				

TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

I/O Characteristics	
Front panel connections	
USB	Four USB 2.0 (type A), Two USB 3.0 ports
Ethernet	Two 10/100/1000BASE-T (RJ45)
Video	Dual Mode DisplayPort (DVI-D, VGA, HDMI with an adapter)
GPIO	Micro-D 25-pin
PCIe connector	x8 PCIe connector (Gen 3) ¹
PXI Trigger	SMB (programmable direction)
PXIe backplane I/O	
PCIe link Configuration Data Band width	Two-link (x8 and x16) and four-link (4x4) automatically configured based on chassis configuration 16 GB/s max to/from the processor to PXIe backplane switch 12 GB/s max between PCIe backplane links (2-link mode x8 and x16) 4 GB/s max between PCIe backplane links (2-link mode 2x8)
PXI trigger bus	Selectable routing to/from all 8 PXI_TRIG lines

1. The front panel PCIe port is rated up Gen 3 with M9037A Serial Number TW57240011 and greater. M9037A with smaller Serial Number supports Gen 2.

Environmental characteristics ^{1,2}		
Operating and storage conditions		
	Operating	Storage
Temperature	0°C to 55°C	-40°C to 70°C
Humidity	Type-tested at 95%, +40°C (non-condensing)	
Operating Altitude	Up to 3048 m (10,000 ft)	
Storage Altitude	15,000 ft (4572 m)	
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		

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.

TECHNICAL SPECIFICATIONS AND CHARACTERISTICS

Regulatory characteristics
Safety IEC/EN 61010-1, 3rd Edition Canada: CSA C22.2 No. 61010-1-12 USA: UL std no. 61010-1, 3rd Edition
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 Cet appareil ISM est conforme a la norme NMB-001 du Canada

Software Information

Model	Description
Supported Operating Systems	Microsoft Windows Embedded Standard 7 (32/64-bit) and Windows 10 Enterprise 2016 LTSC (64-bit)
Standard Compliant Drivers	IVI-COM, IVI-C, LabView
Supported application development environments (ADE)	Visual Studio (VB.NET, C#, C/C++), LabVIEW, LabWindows/CVI, MATLAB
Keysight IO Libraries	Includes: VISA Libraries, Keysight Connection Expert, IO Monitor



This information is subject to change
without notice

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