M9035A PXIe Embedded Controller

3.0 GHz quad core

Introduction

The Keysight Technologies, Inc. M9035A is a low-cost, four-slot PXIe embedded controller with Windows 10 and Windows 11 operating system. It is designed for mid-performance systems and is also well-suited for secure environments due to its front-panel, removable Solid-State Drive (SSD).

The embedded controller is built upon a low-power Intel i3 processor with 4-threads supported through 4 cores. It is an excellent choice for single-chassis, lower-cost applications which still require a quad-core processor.



KEYSIGHT

Key features

- Low-cost, 4-slot PXI controller module
- Intel Quad-Core i3-8100H 3.0 GHz processor
- Front removable 256 GB solid state drive
- Up to 32 GB RAM memory
- Gen 3 PCIe®, 4- or 2-link (up to x24) configuration providing up to 16 GB/s max data bandwidth from CPU to PXIe backplane
- Front panel connections: four USB 2.0, two USB 3.0, two LAN (10/100/1000), two DisplayPort, and one GPIB

Hardware Platform

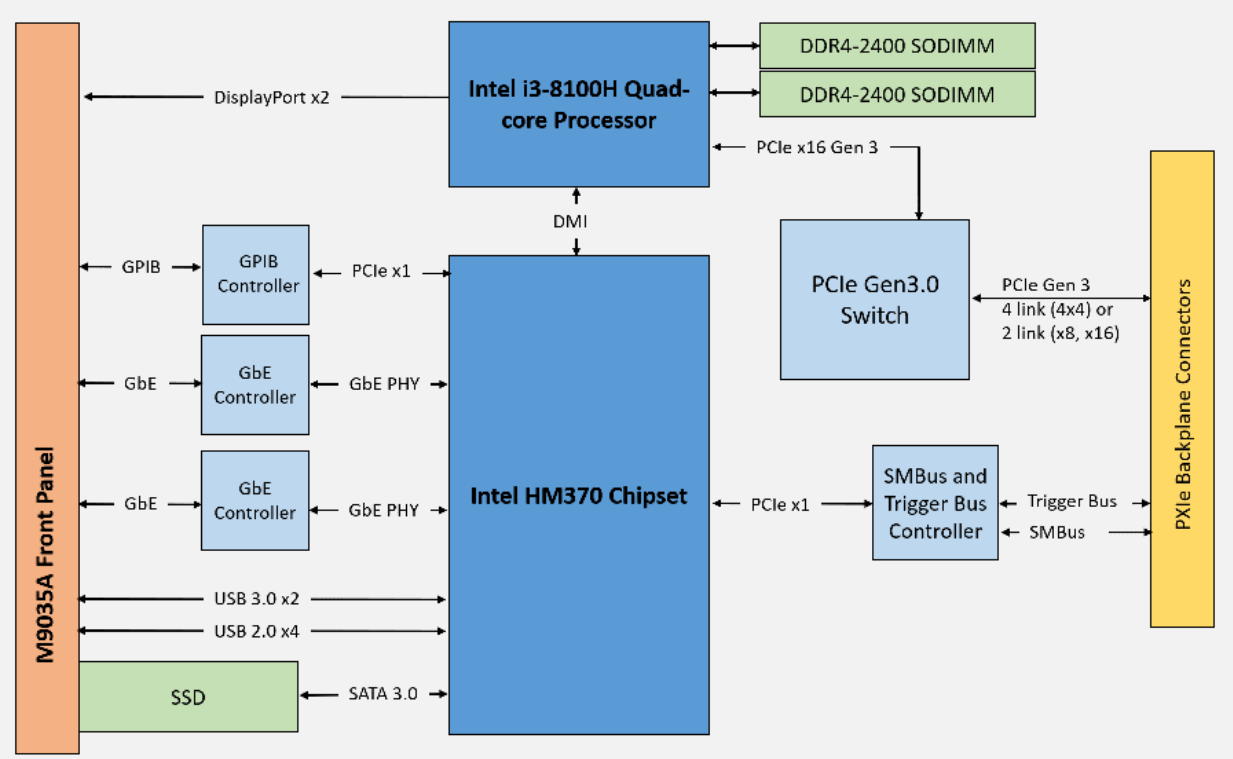


Figure 1. M9035A block diagram

Quad-core processor

The M9035A utilizes a mid-range Intel Core i3-8100H quad-core processor clocked at 3 GHz. The CPU can execute up to four threads simultaneously. The bus speed of the CPU is 8 GT/s.

Memory

The M9035A has two memory connectors: one on top of the other. The module comes standard with one 16 GB memory module (installed in the bottom position). Optionally, a 32 GB memory may be factory installed. Memory modules can be installed bringing the total memory to 32 GB. The controller uses DDR4 2400 SODIMM memory modules.

Solid-state drive

Secure environments benefit from the easily accessible, front removable 256 GB Solid State Drive (SSD) that is secured with front panel thumb screws. The SSD provides a faster boot time and is immune to vibration damage that mechanical drives may experience.

Video

The M9035A graphics are based on the integrated UHD 630 iGPU. The two DisplayPort++ front panel connectors are provided and offer high bandwidth, built-in cable retention and multiple monitor support. Each Dual Mode DisplayPort++ connector can support either a DisplayPort or HDMI by using a DisplayPort adapter (user-supplied).

PXIe backplane configuration

The embedded controller PCIe backplane switch provides a flexible backplane connection that can operate in a 2- or 4-link configuration.

- The PCIe x16 Gen 3 link between CPU and backplane provides up to 16 GB/s data bandwidth

Security features

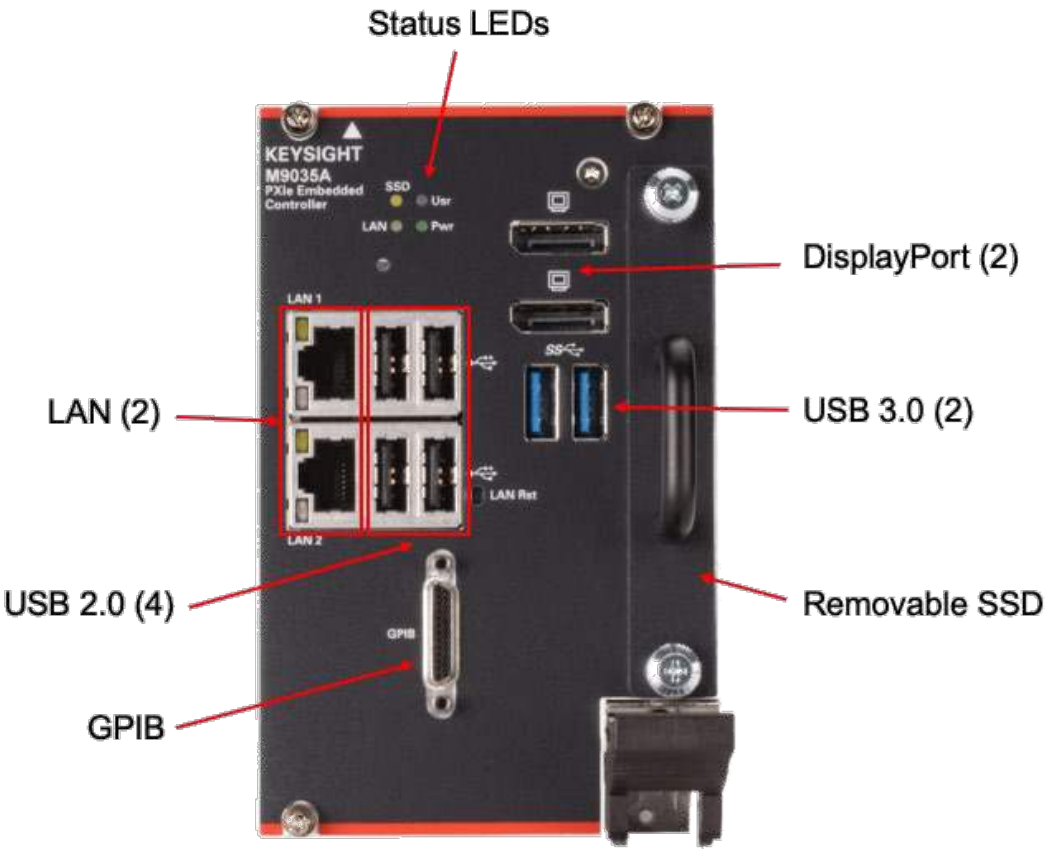
The M9035A has the following security features built-in:

- TPM 2.0: provides hardware-based, security related functions
- UEFI: replaces the legacy BIOS and supports Secure Boot

Software platform

The controller supports Microsoft Windows 10 (64-bit only) or Windows 11 (64-bit) which is installed along with drivers (for Keysight PXIe chassis and M9035A embedded controller), Keysight I/O libraries, VISA, Keysight Connection Expert, and the I/O monitor software.

M9035A front panel



Technical characteristics

General characteristics

Controller characteristics		
CPU		Intel i3-8100H quad-core processor
Chipset		Intel Mobile HM370
CPU threads		4
CPU clock frequency		3.0 GHz
Backplane speed		PCIe revision 3.0 (Gen 3)
Video	Type	Integrated Intel UHD Graphics 630
	Maximum resolution	DP: 4096 x 2304 @ 60 Hz
		HDMI: 4096 x 2304 @ 30 Hz
		Adapter required for HDMI. Maximum resolution achieved may be dependent on the adapter chosen.
Memory	Cache	6 MB
	RAM Type	Two DDR4-2400 204-pin SODIMM sockets
	RAM Capacity	16 GB (standard) or 32 GB (optional)
Storage	Type	2.5" SATA SSD
	Size	256 GB
Operating system support		Windows 10 IoT Enterprise 2019 LTSC Value (64-bit) Windows 11 IoT Enterprise 2024 LTSC 24H2 (64-bit)
Pre-loaded software		Operating system, Keysight I/O libraries, PXIe chassis and M9035A drivers
Mechanical characteristics		
Dimensions		3U/4-slot PXI/CompactPCI standard
Chassis slot compatibility		PXIe system module slot (with three controller expansion slots)
Weight		1.22 kg (2.7 lbs)

DC power requirements					
DC supply	+3.3 V	+5 V	+12 V	+5 VSB mean	Total power
Idle (SATA, Mice & KB)	2.4 A	5.1 A	1.85 A	0.13 A	56.3 W
Full-load	2.5 A	5.7 A	4.2 A	0.13 A	87.8 W

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 (HDMI with an adapter)
GPIB		Micro-D 25-pin
PXIe backplane		
PCIe link	Configuration	Two-link (x8 and x16) and four-link (4x4) automatically configured based on chassis configuration
	Data bandwidth	16 GB/s max to/from the processor to PXIe backplane (Gen 3 chassis)

Environmental characteristics [1, 2]

Operating and storage conditions		
Temperature	Operating 0 °C to 55 °C	Storage -40 °C to 70 °C
Maximum relative humidity (non-condensing)	Type tested, 95%RH up to 40 °C, decreases linearly to 40% RH at 55 °C [3]	
Operating altitude	Up to 3048 m (10 kft)	
Storage altitude	15 kft (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		

Regulatory characteristics

Safety
IEC/EN 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

[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 like MIL-PRF-28800F Class 3.
[3] From 40 °C to 55 °C, the maximum % Relative Humidity follows the line of constant dew point.

Definitions

Specification (spec)
Describes the performance of parameters covered by the product warranty and are valid for the unit's operation within the stated environmental range unless otherwise noted. Specifications include production guardbands to account for the expected statistical performance distribution, measurement uncertainties, and changes in performance due to environmental conditions. Standard calibration services offered by Keysight will ensure all these specifications are measured and a related statement of compliance with specification provided in the resulting calibration report.
Characteristics
Characteristics describe product performance that is useful in the application of the product, but that is not covered by the product warranty. Characteristics are often referred to as Typical or Nominal values.
Typical (typ)
Intended to provide additional information including the expected performance of an average unit that is not covered by the product warranty. These characteristics are shown in italics or labeled as 'typical'. Performance of a customer unit to typical specifications may or may not be measured during a calibration service.
Nominal (nom)
A general, descriptive term that does not imply a level of performance. It is not covered by the product warranty. Represents the value of a parameter that is most likely to occur; the expected mean or mode of all instruments at room temperature (approximately 23 °C). These characteristics are shown in italics or labeled as 'nominal'. Performance of a customer unit to nominal specifications may or may not be measured during a calibration service.
Additional information
The data contained in this document is subject to change.

Ordering Information

Software

Supported software components	
Supported operating systems	Windows 10 IoT Enterprise 2019 LTSC Value (64-bit) Windows 11 IoT Enterprise 2024 LTSC 24H2 (64-bit)
Keysight IO libraries suite (Pre-installed)	Version 2021 or later

Hardware

Model	Description
M9035A	PXIe embedded controller, Intel I3
M9035A-M16	16 GB RAM
M9035A-M32	Memory upgrade from 16 GB RAM to 32 GB RAM
M9035A-W16	Windows 10 IoT Enterprise 2019 LTSC Value (64-bit)
M9035A-W11	Windows 11 IoT Enterprise 2024 LTSC 24H2 (64-bit)
Accessories	**Description**
Y1206A	Keyboard and optical mouse
Y1260A	GPIB cable
Y1262A	DisplayPort cable
Y1267A	Spare SSD and upgrade COA with carrier Win 10 IoT Ent 2019 LTSC Value/64 bit/256GB
Y1267B	Spare SSD and upgrade COA with carrier Win 11 IoT Ent 2024 LTSC 24H2/64 bit/256GB
Y1269A	DisplayPort to HDMI adapter
Related products	**Description**
M9018B and M9019A	18-slot PXIe chassis, Gen 2 or Gen 3
M9010A	10-slot PXIe chassis, Gen 3
M9046A	18-slot PXIe high-performance chassis, Gen 3

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