



# MAGIC1A

## High Performance Rugged Computer with Intel Xeon E Processor and NVIDIA Quadro GPU

The MAGIC1A is a rugged line replaceable unit (LRU) suitable for high-performance computing in the harshest of environments. The combination of Intel processor and NVIDIA GPU processors in a low SWaP-C3 package ensure it can be used across a wide range of commercial and military applications, including displays, situational awareness, data/radar processing, video processing, classification, and artificial intelligence.

### High Performance, High Reliability

The MAGIC1A combines an Intel® Xeon® E3 v6 CPU and an NVIDIA® Quadro® P2000 to provide an ideal platform for both runtime performance and ease of programming. The quad-core CPU and 768-core GPU connected by Gen 3 PCI Express® are capable of up to 2.3 TFLOPS floating point performance.

The MAGIC1A leverages technologies provided by the CPU and GPU: Intel TurboBoost Technology, AVX 2.0 extensions, AES NI instructions, and Hyper-Threading Technology; NVIDIA CUDA® 10; Microsoft DirectX® 12; OpenCL 1.2; OpenGL and H.265 (HEVC)/H.264 hardware encode/decode.

### Extensive I/O

The MAGIC1A has extensive I/O to enable its use in a variety of deployed situations, including Ethernet, USB, ANSI TIA/EIA serial communications, DisplayPort and DVI video output, MIL-STD-1553 and ARINC 429 avionics protocol interfaces, and general purpose I/O.

Optional storage is available and provided by a removable SATA 3 solid state disk, with capacities up to 8 Terabytes with fast purge (single use).

There is a pin-compatible variant for existing customers of MAGIC1.

### AXIS Software Toolkit

AXIS ImageFlex, part of the AXIS Tool Suite, is an image processing and visualization toolkit enabling rapid development of high-performance image processing, visualization and autonomy applications aimed at platforms sensitive to size, weight and power, plus cost, cooling and compliance (SWaP-C3). It is focused on high performance GPU processing and graphics with interoperability with other programming paradigms such as OpenGL, OpenCL, CUDA and OpenCV.

## FEATURES:

- 3U VPX-based LRU
- Qualified for harsh environments
  - MIL-STD-810H
  - MIL-STD-461G
  - With hold-up ~50mS
- Baseplate- or forced-air cooling
- Intel Xeon E3-1505M v6 CPU
  - 16 GB DDR4 SDRAM with ECC
  - 64 GB NAND flash
  - Trusted Platform Module
  - 8 PCIe (Gen 3) lanes to GPU
- NVIDIA Quadro P2000 GPU
  - 4GB GDDR5 SDRAM
  - 128-bit memory width
  - 96GB/s memory bandwidth
  - 768 CUDA cores
  - 2.3 TFLOPs peak performance
  - NVIDIA GPU Direct DMA
- Removable SSD
  - Up to 8 Terabytes storage
- Fast purge capability
- MIL-STD-1553 interface
- ARINC 429 avionics interface
- MAGIC1 compatible variant
- Linux and Windows OS support
- AXIS software support

MAGIC1A High Performance Rugged Computer with Intel Xeon E Processor and NVIDIA Quadro GPU

Specifications

**CPU**

- Intel Xeon E3-1505M v6 (Quad Core) @ 3 GHz base frequency, up to 4.0 GHz TurboBoost\*

**Main memory**

- 8 MB last level cache
- 16 GB DDR4 SDRAM soldered with ECC
- 64 GB SSD

**Local Flash memory**

- 32 GB flash

**GPU**

- NVIDIA Quadro P2000
- 768 CUDA cores
- 4 GB GDDR5 SDRAM

**Removable mass storage**

- Up to 8 TB\*
- With fast purge

**Shock & Vibration**

- MIL-STD-810H (CAT 14, 40G-shock)

**EMC**

- MIL-STD-461G
- MIL-STD-704F (hold-up capable\*)

**Software support**

- Linux distribution via Abaco p/n SLIA-MAGIC1A-01M
- Additional BIOS support for Windows, VxWorks\*, OpenGL, DirectX, NVIDIA® PhysX®, NVIDIA 3D Vision®

**Front panel Interfaces**

- Two ports of 1000BASE-T
- Two USB 2.0 ports
- Two 16C550 compatible async serial ports
- COM1 is 2-wire RS-232 port
- COM2 can be configured as a 2 wire RS-232 port, or a 4 wire RS-232/422 port
- Two single link DVI (from NVIDIA GPU)\*\*
- Two DisplayPort ports (from NVIDIA GPU)
- Four MIL-STD-1553
- Seven Tx ARINC 429\*
- Ten Rx ARINC 429\*
- Six avionics discrete\* and Six GPIO
- Test cable: MAGIC1A-CBL-1

**Operating Temperature**

- -40°C to +65°C baseplate temperature (baseplate-cooled)
- -40°C to +65 °C air at 15,000 m altitude (forced-air)

**Storage Temperature**

- -50°C to +100°C

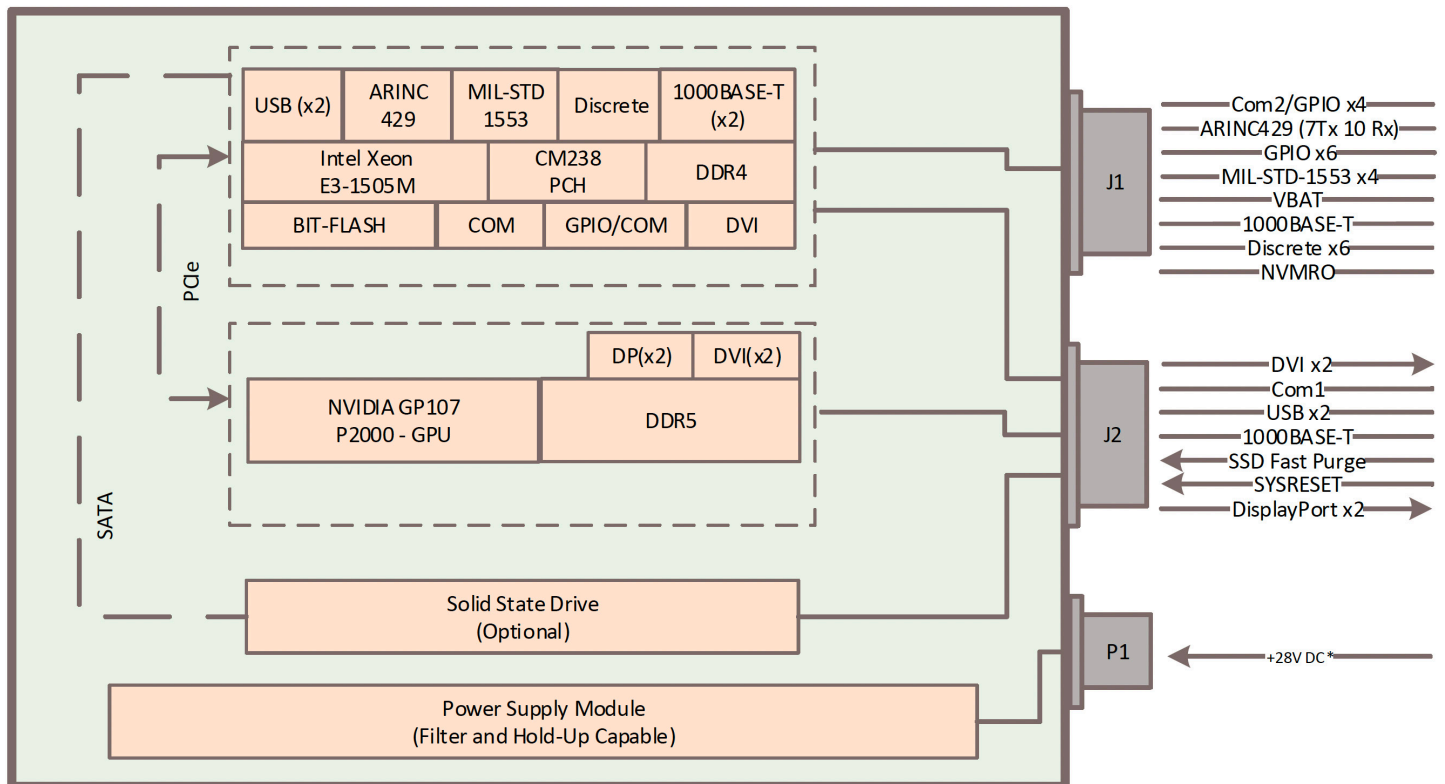
**I/O Connectors**

- MIL-DTL-38999
- Two 100-contact connectors (I/O)
- One six-contact connector (power)

**Dimensions**

- AFT: 4.06H x 11.89L (w/ fan) x 6.75W
- Conduction: 4.06H x 9.32L x 6.75W
- Conduction w/ fins: 4.06H x 9.32L x 6.75W

MAGIC1A enhanced functionality variant (MAGIC1A-xxxxxx1)



\* Contact Abaco Sales Team for assistance in additional options/configurations.

\*\* Availability may be based on Operating System.



MAGIC1A High Performance Rugged Computer with Intel Xeon E Processor and NVIDIA Quadro GPU

Specifications

**CPU**

- Intel Xeon E3-1505M v6 (Quad-Core)  
@ 3 GHz base frequency, up to 4.0 GHz TurboBoost\*

**Main memory**

- 8 MB last level cache
- 16 GB DDR4 SDRAM soldered with ECC
- 64 GB SSD

**Local Flash memory**

- 32 GB Flash

**GPU**

- NVIDIA Quadro P2000
- 768 CUDA Cores
- 4 GB GDDR5 SDRAM

**Removable mass storage**

- Up to 8 TB\*
- With fast purge

**Shock & Vibration**

- MIL-STD-810H (CAT 14, 40G-shock)

**EMC**

- MIL-STD-461G
- MIL-STD-704F (hold-up capable\*)

**Software support**

- Linux distribution via Abaco p/n SLIA-MAGIC1A-01M
- Additional BIOS support for Windows, VxWorks\*, OpenGL, DirectX, NVIDIA® PhysX®, NVIDIA 3D Vision®

**Front panel Interfaces**

- Six ports of 1000BASE-T
- Four USB 2.0 ports
- Two 16C550 compatible async serial ports
- COM1 is 2-wire RS-232 port
- COM2 can be configured as a 2 wire RS 232 port, or a 4 wire RS-232/422 port
- Two single link DVI/DisplayPort
- One VGA (from NVIDIA GPU)
- Four General Purpose IO
- Test Cable: MAGIC1A-CBL-L

**Operating Temperature**

- -40°C to +65°C baseplate temperature (baseplate-cooled)
- -40°C to +65 °C air at 15,000 m altitude (forced-air version)

**Storage Temperature**

- -50°C to +100°C

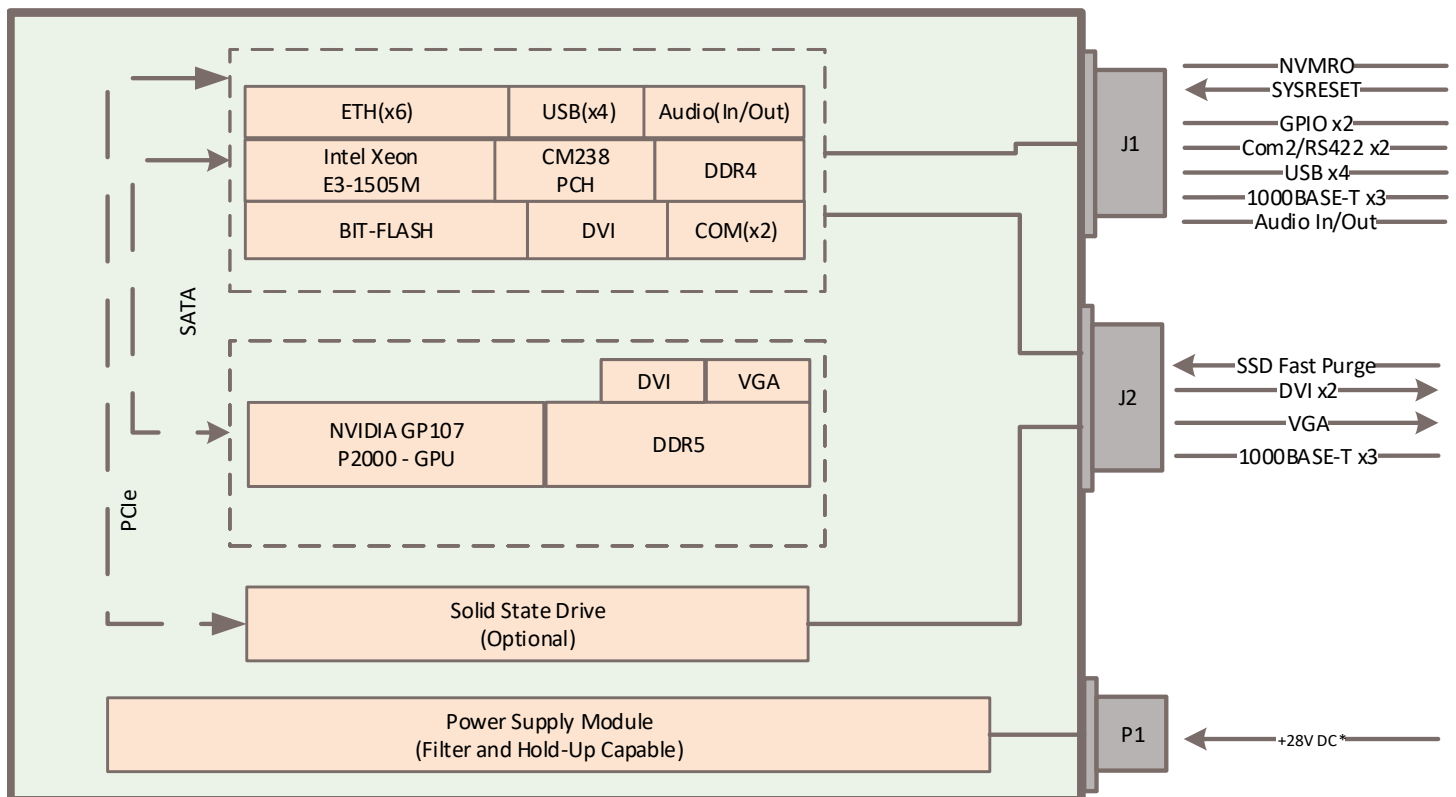
**I/O Connectors**

- MIL-DTL-38999
- Two 79-pin
- One six-pin connector (power)

**Dimensions (in)**

- AFT: 4.06H x 11.89L (w/ fan) x 6.75W
- Conduction: 4.06H x 9.32L x 6.75W
- Conduction w/ fins: 4.06H x 9.32L x 6.75W

MAGIC1 Compatible variant (MAGIC1A-xxxxxxL)



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MAGIC1A High Performance Rugged Computer with Intel Xeon E Processor and NVIDIA Quadro GPU

Specifications

**CPU**

- Intel Xeon E3-1505M v6 (Quad-Core) @ 3 GHz base frequency, up to 4.0 GHz TurboBoost\*

**Main memory**

- 8 MB last level cache
- 16 GB DDR4 SDRAM soldered with ECC
- 64 GB SSD

**Local Flash memory**

- 32 GB Flash

**GPU**

- NVIDIA Quadro P2000
- 768 CUDA Cores
- 4 GB GDDR5 SDRAM

**Removable mass storage**

- Up to 8 TB\*
- With fast purge

**Shock & Vibration**

- MIL-STD-810H (CAT 14, 40G-shock)

**EMC**

- MIL-STD-461G
- MIL-STD-704F (hold-up capable\*)

**Software support**

- Linux distribution via Abaco p/n SLIA-MAGIC1A-01M
- Additional BIOS support for Windows, VxWorks\*, OpenGL, DirectX, NVIDIA® PhysX®, NVIDIA 3D Vision®

**Front panel Interfaces**

- Six ports of 1000BASE-T
- Four USB 2.0 ports
- Two 16C550 compatible async serial ports
- COM1 is 2-wire RS-232 port
- COM2 can be configured as a 2 wire RS 232 port, or a 4 wire RS-232/422 port
- Two single link DVI/DisplayPort
- One VGA (from NVIDIA GPU)
- Four General Purpose IO
- One 3G-SDI\*
- Test Cable: MAGIC1A-CBL-L

**Operating Temperature**

- -40°C to +65°C baseplate temperature (baseplate-cooled)
- -40°C to +65 °C air at 15,000 m altitude (forced-air version)

**Storage Temperature**

- -50°C to +100°C

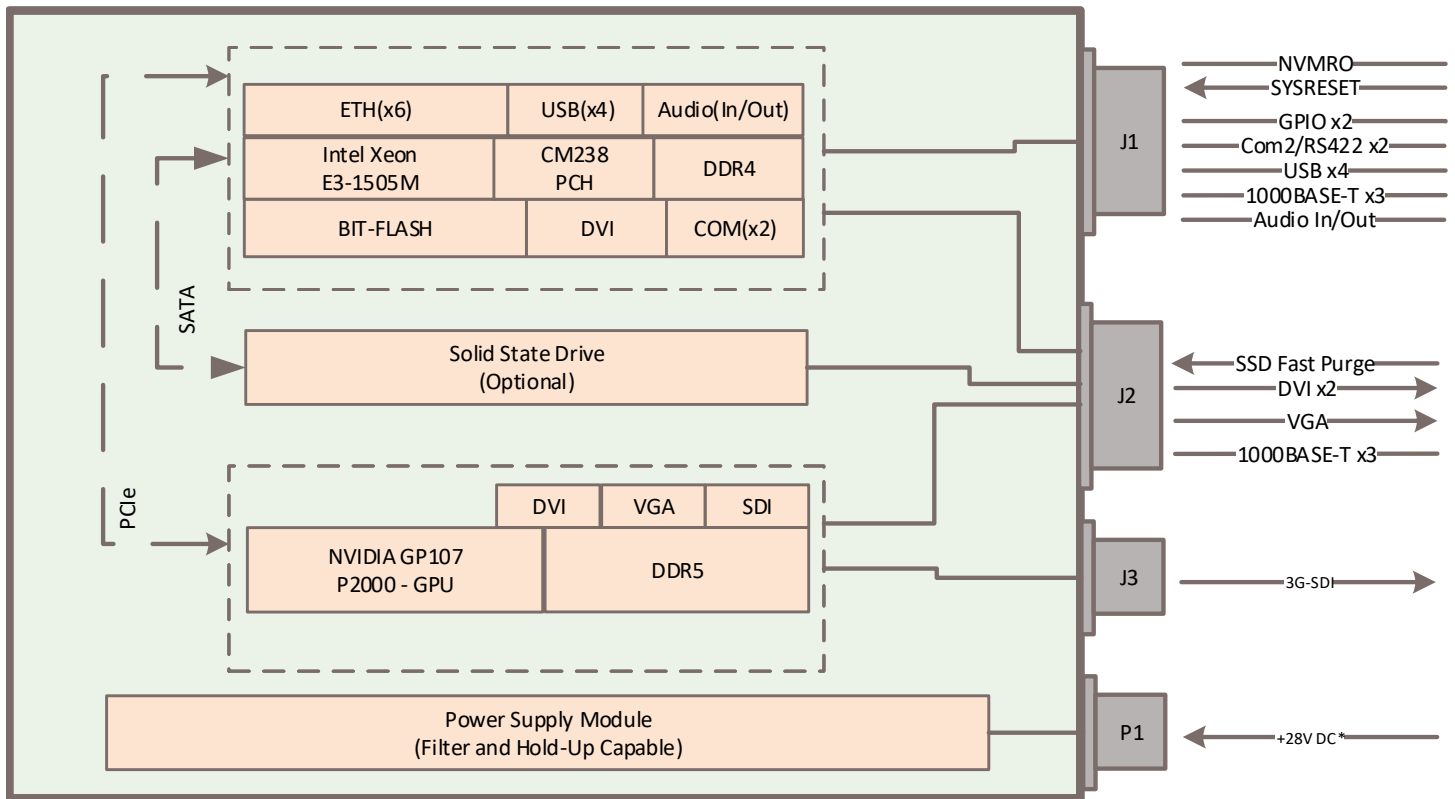
**I/O Connectors**

- MIL-STD-38999
- Two 79-pin
- SDI Video Option Available\*
- One six-pin connector (power)

**Dimensions (in)**

- AFT: 4.06H x 11.89L (w/ fan) x 6.75W
- Conduction: 4.06H x 9.32L x 6.75W
- Conduction w/ fins: 4.06H x 9.32L x 6.75W

MAGIC1 Compatible variant (MAGIC1A-xxxxxx2)



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Abaco Systems is a global leader in commercial open architecture computing and rugged embedded electronics. With more than 30 years of experience in aerospace & defense, industrial, energy, medical, communications and other critical sectors, Abaco's innovative solutions align with open standards to accelerate customer success.

Abaco Systems is a subsidiary of AMETEK, Inc., a leading global manufacturer of electronic instruments and electromechanical devices with 2020 sales of more than \$4.5 billion.