# GM-1100

14/13/12th Gen Intel® Core™ Series Embedded GPU Computer, Supports 1x MXM 3.1 GPU Expansion Socket

## Overview

CONTACT

The GM-1100 is a compact and rugged embedded MXM GPU computer for high-performance computing needs. It combines powerful computing and graphics processing capabilities with highly flexible expansion, making it ideal for edge AI applications with limited installation space.

### Key Features

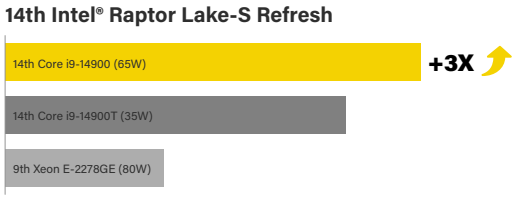
- Intel® 14/13/12th Gen Core™ i9/i7/i5/i3 Processors (max 65 W TDP)
- Supports 1x MXM 3.1 Type A/B form factor GPU module expansion
- 1x 2.5GbE LAN, 1x 20Gbps USB3.2 Gen2 x2, Type C Connector
- 1x M.2 Key M Type 2280 Socket for PCIe Gen4x4 NVMe Storage
- 1x M.2 Key E Type 2230 Socket for Wireless/Intel CNVi Module Expansion
- 1 x M.2 Key B Type 3052/3042 Socket for 5G/Storage/Add-on Card Expansion
- 2 x M.2 Key B Type 2242 Socket for Storage/Add-on Card Expansion
- Optional CMI & CFM Modules for I/O Expansion & Power Ignition Sensing Function
- Wide operating temperature -40°C to 70°C

### Certifications

MIL-STD-810H EN 50121-3-2

## 3X Performance boost

Equipped with a 14th generation Intel® Core (Raptor Lake-S Refresh) processor, the GM-1100 is capable of three times the computing performance of its predecessor. For highly complex or specialized tasks the hybrid or P-core monolithic architecture can be chosen for the best performance based on specific needs.



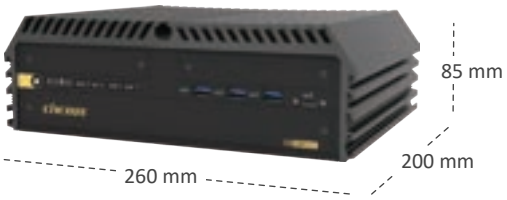
## MXM GPU module

Type A and B MXM GPU modules allow comprehensive options to suit lightweight AI or high-performance AI inference applications. The special modular design also means painless upgrades to higher-end MXM modules to bolster performance in the future.

Type A Type B

## High-speed connections and data storage

Native 2.5GbE LAN and 20Gbps USB 3.2 Gen2x2 Type-C high-speed connections effectively improve the efficiency of image and file transfer. Storage options include two 2.5" HDD/SSD bays and options for high-speed NVMe SSD storage.




## Ideal for mobility applications

Compact size (260 x 200 x 85 mm), multiple M.2 expansion slots for 5G of Wi-Fi communication modules, and compliance with rail transit certification (EN50121-3-2) and vehicle certification (E-mark) make the GM-1100 ideal for mobility applications.

EN 50121-3-2 E13 WIFI 5G

## Superior cooling performance

The innovative thermal design improves system cooling by providing independent heat dissipation channels for the CPU and GPU to the upper cover and sides of the extruded aluminum case. Combined with an external fan, it provides a solid foundation for stable and reliable operation.

**External fan accelerates heat disspation**

+

**Independent cooling for CPU & GPU**

## Rugged safety

The harsh challenges of the Edge AI environment are overcome with industrial grade wide temperature (-40 to 70°C) and wide voltage (9 to 48 VDC) support, and passing the US military shock standard (MIL-STD-810H) to ensure product stability and safety.

-40 – 70°C
-40 – 158°F

9 - 48VDC

MIL-STD-810H

## Specifications

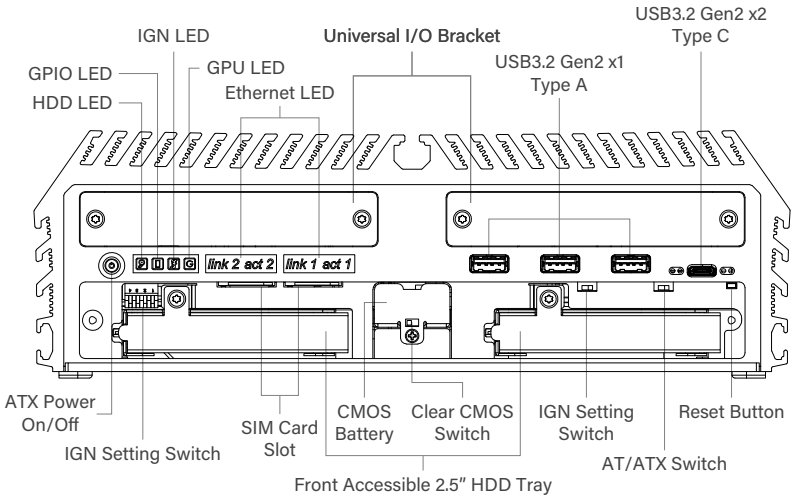
| Model Name | GM-1100 |
|---|---|
| **System** | |
| Processor | ▪ 14th Generation Intel® Raptor Lake-S Refresh Series CPU (Coming Soon)<br>▪ 13th Generation Intel® Raptor Lake-S Series CPU:<br>- Intel® Core™ i9-13900E 24 Cores Up to 5.2 GHz, TDP 65W<br>- Intel® Core™ i7-13700E 16 Cores Up to 5.1 GHz, TDP 65W<br>- Intel® Core™ i5-13500E 14 Cores Up to 4.6 GHz, TDP 65W<br>- Intel® Core™ i5-13400E 10 Cores Up to 4.6 GHz, TDP 65W<br>- Intel® Core™ i3-13100E 4 Cores Up to 4.4 GHz, TDP 65W<br>- Intel® Core™ i9-13900TE 24 Cores Up to 5.0 GHz, TDP 35W<br>- Intel® Core™ i7-13700TE 16 Cores Up to 4.8 GHz, TDP 35W<br>- Intel® Core™ i5-13500TE 14 Cores Up to 4.5 GHz, TDP 35W<br>- Intel® Core™ i3-13100TE 4 Cores Up to 4.1 GHz, TDP 35W<br>▪ 12th Generation Intel® Alder Lake-S Series CPU:<br>- Intel® Core™ i9-12900E 16 Cores Up to 5.0 GHz, TDP 65W<br>- Intel® Core™ i7-12700E 12 Cores Up to 4.8 GHz, TDP 65W<br>- Intel® Core™ i5-12500E 6 Cores Up to 4.5 GHz, TDP 65W<br>- Intel® Core™ i3-12100E 4 Cores Up to 4.2 GHz, TDP 60W<br>- Intel® Core™ i9-12900TE 16 Cores Up to 4.8 GHz, TDP 35W<br>- Intel® Core™ i7-12700TE 12 Cores Up to 4.7 GHz, TDP 35W<br>- Intel® Core™ i5-12500TE 6 Cores Up to 4.3 GHz, TDP 35W<br>- Intel® Core™ i3-12100TE 4 Cores Up to 4.0 GHz, TDP 35W<br>- Intel® Pentium® G7400E 2 Cores Up to 3.6 GHz, TDP 46W<br>- Intel® Pentium® G7400TE 2 Cores Up to 3.0 GHz, TDP 35W<br>- Intel® Celeron® G6900E 2 Cores Up to 3.0 GHz, TDP 46W<br>- Intel® Celeron® G6900TE 2 Cores Up to 2.4 GHz, TDP 35W |
| Chipset | ▪ Intel R680E Chipset |
| Memory | ▪ 2x DDR5 4800 MHz SO-DIMM Socket, Supports Un-buffered and ECC Type, Up to 64 GB |
| BIOS | ▪ AMI BIOS |
| **Graphics** | |
| Graphics Engine | ▪ Integrated Intel® UHD Graphics 770: Core™ i9/i7/i5<br>▪ Integrated Intel® UHD Graphics 730: Core™ i3<br>▪ Integrated Intel® UHD Graphics 710: Pentium®/Celeron® |
| Maximum Display Output | ▪ Supports Triple Independent Display |
| DP | ▪ 1x DisplayPort Connector (4096 x 2304@60Hz)<br>*Verified maximum resolution: 3840 x 2160@60Hz |
| HDMI | ▪ 1x HDMI Connector (4096 x 2160@30Hz)<br>*Verified maximum resolution: 3840 x 2160@30Hz |
| VGA | ▪ 1x VGA Connector (1920 x 1200 @60Hz) |
| **Audio** | |
| Audio Codec | ▪ Realtek® ALC888, High Definition Audio |
| Line-out | ▪ 1x Line-out, Phone Jack 3.5mm |
| Mic-in | ▪ 1x Mic-in, Phone Jack 3.5mm |
| **I/O** | |
| LAN | ▪ 1x 2.5GbE LAN, RJ45<br>- Intel® I225<br>▪ 1x 1GbE LAN, RJ45<br>- Intel® I219 |
| COM | ▪ 4x RS-232/422/485 with Auto Flow Control (Supports 5V/12V), DB9 |
| USB | ▪ 1x 20Gbps USB3.2 Gen2 x2, Type C<br>▪ 3x 10Gbps USB3.2 Gen2 x1, Type A<br>▪ 4x 5Gbps USB3.2 Gen1 x1, Type A |

| | |
|---|---|
| **Storage** | |
| SSD/HDD | ▪ 2x 2.5" Front Accessible SATA HDD/SSD Drive Bay ( SATA3.0 ) (up to 15mm in Height) |
| M.2 SSD | ▪ 1x M.2 Key M Type 2280 Socket, Support PCIe Gen4 x4 NVMe SSD or SATA SSD (SATA3.0)<br>▪ 1x M.2 SSD Shared by M.2 Key B Type 3052 Socket, Support PCIe Gen 3x2 NVMe SSD or SATA SSD (SATA3.0)<br>▪ 2x M.2 SSD Shared by M.2 Key B Type 2242 Socket, Support PCIe Gen 4x2 NVMe SSD or SATA SSD (SATA3.0) |
| RAID | ▪ Support RAID 0/1/5/10 |
| **Expansion** | |
| MXM Socket | ▪ 1x MXM Carrier Board Socket for MXM GPU Module Expansion |
| M.2 E Key Socket | ▪ 1x M.2 Key E Type 2230 Socket (PCIe Gen 3x2 / USB2.0), Support Wireless/Intel CNVi Module Expansion |
| M.2 B Key Socket | ▪ 1x M.2 Key B Type 3042/3052 Socket (PCIe Gen 3x2 / USB3.2 Gen2x1 / USB2.0 / SATA), Support 5G/Storage/Add-on Card Expansion<br>▪ 2x M.2 Key B Type 2242 Socket (PCIe Gen 4x2 / USB2.0 / SATA ), Support Storage/Add-on Card Expansion |
| SIM Socket | ▪ 2x SIM Socket |
| CMI (Combined Multiple I/O) Interface | ▪ 1x High Speed CMI Interface for optional CMI Module Expansion<br>▪ 1x Low Speed CMI Interface for optional CMI Module Expansion |
| CFM (Control Function Module) Interface | ▪ 1x CFM IGN Interface for optional CFM-IGN Module Expansion |
| **Other Function** | |
| External FAN Connector | ▪ 2x External FAN Connector, 4-pin Terminal Block (Support Smart Fan by BIOS) |
| Power Ignition Sensing | ▪ Support Power Ignition Sensing Function with Delay Time Management and Selectable 12V/24V (With Optional CFM Module) |
| Clear CMOS Switch | ▪ 1x Clear CMOS Switch |
| Reset Button | ▪ 1x Reset Button |
| Instant Reboot | ▪ Support 0.2sec Instant Reboot Technology |
| Watchdog Timer | ▪ Software Programmable Supports 256 Levels System Reset |
| Antenna Holes | ▪ 2x Antenna Holes |
| Status LED Indicator | ▪ HDD LED、GPIO LED、IGN LED、GPU LED、Ethernet LED |
| **Power** | |
| Power Button | ▪ 1x ATX Power On/Off Button |
| Power Mode Switch | ▪ 1x AT/ATX Mode Switch |
| Power Input | ▪ 9-48 VDC, Single Power Source<br>Connector Type: 2x 3-pin Terminal Block, Each Terminal Block Current Limitation is 15A<br>▪ Power input voltage from 9V to 23V must use dual power connectors, power input voltage from 24V to 48V can use single power connector |
| Remote Power On/Off | ▪ 1x Remote Power On/Off, 2-pin Terminal Block |
| Max. Power Consumption | ▪ 35W CPU: 187.51W<br>▪ 65W CPU: 258.96W<br>- Test conducted with CPU, 1x RAM, and 1x storage<br>- 100% load during burn-in testing. |
| Inrush Current (Peak) | ▪ 35W CPU: 5.467 A@24V<br>▪ 65W CPU: 5.725 A@24V |
| **Physical** | |
| Dimension ( W x D x H ) | ▪ 260 x 200 x 85 mm |
| Weight Information | ▪ 4.73 kg |
| Mechanical Construction | ▪ Extruded Aluminum with Heavy Duty Metal |
| Mounting | ▪ Wall / Side / DIN-RAIL / VESA Mount |

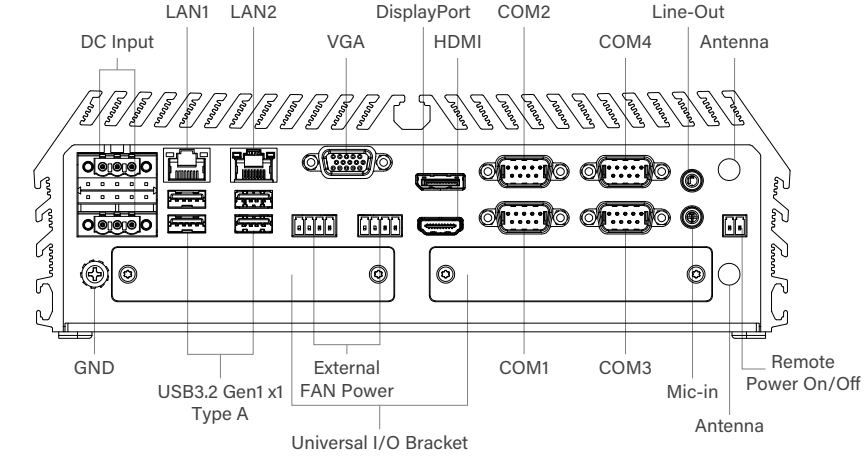
| | |
|---|---|
| Physical Design | ▪ Fanless Design<br>▪ Cableless Design<br>▪ Jumper-less Design<br>▪ Unibody Design |
| **Reliability & Protection** | |
| Reverse Power Input Protection | ▪ Yes |
| Over Voltage Protection | ▪ Protection Range: 51~58V<br>▪ Protection Type: shut down operating voltage, re-power on at the preset level to recover |
| Over Current Protection | ▪ 30A |
| CMOS Battery Backup | ▪ SuperCap Integrated for CMOS Battery Maintenance-free Operation |
| MTBF | ▪ 313,541 Hours<br>- Database: Telcordia SR-332 Issue3, Method 1, Case 3 |
| **Operating System** | |
| Windows | ▪ Windows®11, Windows®10 |
| Linux | ▪ Ubuntu Desktop 22.04 LTS |
| **Environment** | |
| Operating Temperature | ▪ 35W TDP Processor: -40°C to 70°C<br>▪ 65W TDP Processor with external FAN: (TBC)<br>* PassMark BurnInTest: 100% CPU, 2D/3D Graphics (without thermal throttling)<br>* For GM-1100 + MXM GPU Module operating temperature, please refer to the last page – Operating Temperature Matrix Table for more information (TBC)<br>* With extended temperature peripherals; Ambient with air flow<br>* According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14 |
| Storage Temperature | ▪ -40°C to 70°C |
| Relative Humidity | ▪ 95%RH @ 70°C (non-Condensing) |
| Shock | ▪ MIL-STD-810H |
| Vibration | ▪ MIL-STD-810H |
| EMC | ▪ CE, UKCA, FCC, ICES-003 Class A<br>▪ EN 50155 (EN 50121-3-2 Only)<br>▪ E-mark (Pending) |
| EMI | ▪ CISPR 32 Conducted & Radiated: Class A<br>▪ EN/BS EN 50121-3-2 Conducted & Radiated: Class A<br>▪ EN/BS EN IEC 61000-3-2 Harmonic current emissions: Class A<br>▪ EN/BS EN 61000-3-3 Voltage fluctuations & flicker<br>▪ FCC 47 CFR Part 15B, ICES-003 Conducted & Radiated: Class A |
| EMS | ▪ EN/IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV<br>▪ EN/IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 20 V/m<br>▪ EN/IEC 61000-4-4 EFT: AC Power: 2 kV; Signal: 2 kV<br>▪ EN/IEC 61000-4-5 Surges: AC Power: 2 kV<br>▪ EN/IEC 61000-4-6 CS: 10V (**Compliant with the standard when utilizing shielded cable.)<br>▪ EN/IEC 61000-4-8 PFMF: 50 Hz, 1A/m<br>▪ EN/IEC 61000-4-11 Voltage Dips & Voltage Interruptions: 0.5 cycles at 50 Hz |

## External Layout

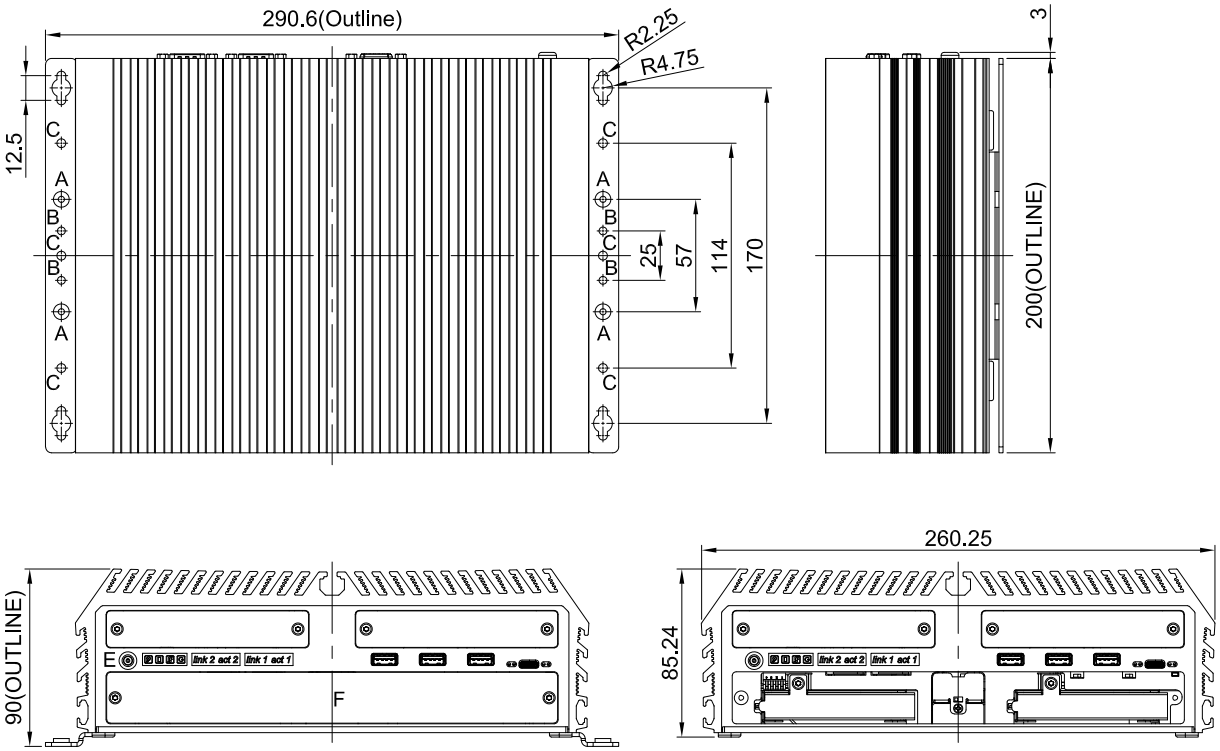
### Front I/O




### Rear I/O




## Dimensions




Unit: mm

# Ordering Information

## Available Models

| Model No. | Description |
|---|---|
| GM-1100-R10 | 14/13/12th Gen Intel® Core™ Series Embedded GPU Computer, Supports 1x MXM 3.1 GPU Expansion Socket |

## Package Checklist

| | |
|---|---|
| ▪ GM-1100 GPU Computer x1 | ▪ Remote Function Terminal Block Connector x1 |
| ▪ CPU Heatsink Pack x1 | ▪ External Fan Terminal Block Connector x2 |
| ▪ Screw Pack x1 | ▪ Wall Mounting Kit x1 |
| ▪ Power Terminal Block Connector x2 | ▪ M.2 Key B Type 3052 to 3042 Adapter Bracket x1 |

## Optional MXM GPU Module & Accessories

| Model No. | Description |
|---|---|
| MXM-A4500-R10 | NVIDIA Embedded RTX A4500 MXM Type A, 16G, 80W Kit with Heatsink and Thermal Pad |
| MXM-A2000-R10 | NVIDIA Embedded RTX A2000 MXM Type A, 8G, 60W Kit with Heatsink and Thermal Pad |
| MXM-A1000-R10 | NVIDIA Embedded RTX A1000 MXM Type A, 4G, 60W Kit with Heatsink and Thermal Pad |
| MXM-A500-R10 | NVIDIA Embedded RTX A500 MXM Type A, 4G, 40W Kit with Heatsink and Thermal Pad |
| MXM-RTX3000-T10 | Nvidia Quadro Embedded RTX3000 MXM Kit with Heatsink and Thermal Pad |
| MXM-T1000-R10 | Nvidia Quadro Embedded T1000 MXM Kit with Heatsink and Thermal Pad |
| MXM-HSKA-01 | MXM Type A Heatsink Kit for MXM-A500 |
| MXM-HSKA-02 | MXM Type A Heatsink Kit for MXM-A1000 & MXM-A2000 |
| MXM-HSKA-03 | MXM Type A Heatsink Kit for MXM-T1000 |
| MXM-HSKB-01 | MXM Type B Heatsink Kit for MXM-A4500 |
| MXM-HSKB-02 | MXM Type B Heatsink Kit for MXM-RTX3000 |

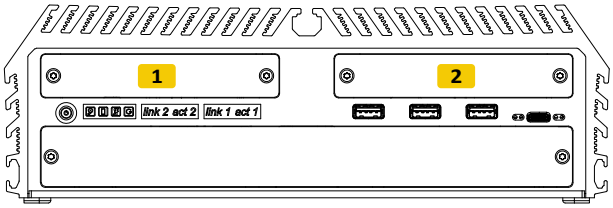
## Optional Modules and Accessories

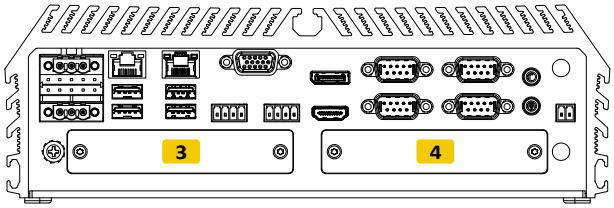
| Model No. | Description |
|---|---|
| CB-DP02-R10 | Carrier board with one MXM 3.1 interface and no DisplayPort output for MXM-A500 |
| CB-DP03-R10 | Carrier Board with 1x MXM 3.1 Interface and 4x DisplayPort Output |
| CB-DP04-R10 | Carrier Board with 1x MXM 3.1 Interface and 4x DisplayPort Output for MXM-A4500 |
| CMI-LAN01-R12 | CMI Module with 4x RJ45 Intel I210 GbE LAN Ports |
| CMI-M12LAN01-R12 | CMI Module with M12 A-Coded Connector, 4x Intel I210 GbE LAN Ports |
| CMI-XM12LAN01-R10 | CMI Module with M12 X-Coded Connector, 4x Intel I210 GbE LAN Ports |
| CMI-10GLAN01-R10 | CMI Module with 2x Intel® X550 10GbE LAN, RJ45 Port |
| CMI-DIO01 | CMI Module with 16x Optical Isolated DIO (8 in/8 out) |
| CMI-COM01 | CMI Module with 2x RS232/422/485 (Support 5V/12V) |
| CFM-PoE01 | CFM Module with PoE Control Function, Individual Port 25.5W |
| CFM-IGN01 | CFM Module with Power Ignition Sensing Control Function, 12V/24V Voltage Detection Selectable |
| UB1303 | Universal Bracket with 2x DB9 Cutout |
| UB1310 | Universal Bracket with 4x M12 Cutout |
| UB1312 | Universal Bracket with 4x RJ45 Cutout |
| UB1318 | Universal Bracket with DIO Cutout |
| UB1328 | Universal Bracket with 2x RJ45 Cutout |
| UB1329 | Universal Bracket with 4x DP |
| UB1330-R10 | Universal Bracket with 4x M12 X-Coded Cutout |
| UB1332-R10 | Universal Bracket with 3x Antenna Cutout |
| FAN-EX102 | External Fan Kit with 2x 4pin Terminal Block Plug for GM Series, Support Smart Fan Function |
| SIDE-GM | GM Series side mount kit |
| DIN01 | DIN-RAIL Mount Kit, KMRH-K175 |
| GST220A24-CIN | Adapter AC/DC 24V 9.2A 220W with 3pin Terminal Block Plug 5.0mm Pitch, with TUBES, level VI |
| GST360A24-CIN | Adapter AC/DC24V 15A 360W with 3pin Terminal Block Plug 5.0mm Pitch, with TUBES, level VI |
| RSD-200D-24 | Railway Single Output DC-DC Converter 200W / DC 24V |
| Power Cable | 1M Power Cable with 3-Pin Terminal Block Plug, Stripped and Tinned End with Tube |

## Carrier Board and MXM GPU Compatibility Matrix

| | CB-DP02 (compatible with standard UB) | CB-DP03/UB1329 | CB-DP04/UB1329 |
|---|---|---|---|
| MXM-A500 | V | | |
| MXM-A1000 | | V | |
| MXM-A2000 | | V | |
| MXM-A4500 | | | V |
| MXM-T1000 | | V | |
| MXM-RTX3000 | | V | |

## Optional Module Configuration




| Model No. | Description | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| CB-DP02-R10 | Carrier board with one MXM 3.1 interface and no DisplayPortoutput for MXM-A500. (Compatible with GM-1100 standard universal bracket) | V | - | - | - |
| CB-DP03-R10/UB1329 | Carrier Board with 1x MXM 3.1 Interface and 4x DisplayPort Output / 1x Universal Bracket with 4xDP Cutout | V | - | - | - |
| CB-DP04-R10/UB1329 | Carrier Board with 1x MXM 3.1 Interface and 4x DisplayPort Output for MXM-A4500 / 1x Universal Bracket with 4xDP Cutout | V | - | - | - |
| CMI-LAN01-R12/UB1312 | CMI Module with 4x Intel® I210 GbE LAN, RJ45 Port / 1x Universal Bracket with 4x RJ45 Cutout for GM Series | - | V | - | - |
| CMI-10GLAN01-R10/UB1328 | CMI Module with 2x Intel® X550 10GbE LAN, RJ45 Port / 1x Universal Bracket with 2x RJ45 Cutout for GM Series | - | V | - | - |
| CMI-M12LAN01-R12/UB1310 | CMI Module with M12 Connector, 4x Intel® GbE LAN Ports / 1x Universal Bracket with 4x M12 Cutout for GM Series | - | V | - | - |
| CMI-XM12LAN01-R10/UB1330-R10 | CMI Module with M12 X-Coded Connector, 4x Intel I210 GbE LAN Ports / Universal Bracket with 4x M12 X-Coded Cutout | - | V | - | - |
| CMI-DIO01/UB1318 | CMI Module with 16DIO (8in 8out) / 1xUniversal Bracket with DIO Cutout for DX & GM Series | - | - | - | V |
| CMI-COM01/UB1303 | CMI Module with 2x RS232/422/485 (Support 5V/12V) / 1x Universal Bracket with 2x DB9 Cutout for DX & GM Series | - | - | - | V |
| UB1332-R10 | Universal Bracket with 3x Antenna Cutout | V | V | - | - |

V : Compatible

## Operating Temperature Matrix Table

| Model No. | GPU Model | 35W CPU | 65W CPU |
|---|---|---|---|
| MXM-A4500-R10 | NVIDIA RTX Embedded A4500 (80W) | TBC | TBC |
| MXM-A2000-R10 | NVIDIA RTX Embedded A2000 (60W) | TBC | TBC |
| MXM-A1000-R10 | NVIDIA RTX Embedded A1000 (60W) | TBC | TBC |
| MXM-A500-R10 | NVIDIA RTX Embedded A500 (40W) | TBC | TBC |
| MXM-RTX3000-R10 | Nvidia Quadro Embedded RTX3000 ( 80W ) | TBC | TBC |
| MXM-T1000-R10 | Nvidia Quadro Embedded T1000 ( 50W ) | TBC | TBC |

* External Fan Kit - FAN-EX102 is required for above configurations.
* PassMark BurnInTest: 100% CPU, 2D Graphics (without thermal throttling)
* Furmark: 1920x 1080, 8x MSAA (without thermal throttling)

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