



## Features

- Intel® Meteor Lake-U Core™ Ultra 7/5 Processor
- 2 x 262-pin SODIMM socket Max. up to 64GB DDR5 5600MT/s
- Rich I/O, 4-USB3.2, 2-USB2.0, 1-DP, 2-HDMI, 2-COM, 2-LAN, 1-8bit GPIO
- Support 5G (Sub-6G) module, M.2 NVMe SSD Gen4 x 4
- Fanless operation Temperature from -40°C ~ 65°C
- CE, FCC Class B, KC
- Wide range DC power input from +9 ~ 36V
- Support HW TPM 2.0



Modular Design



5G/ Wi-Fi 6E Available



Vibration/ Shock  
2G/55G



WT -40~65°C



Wide-DC Input  
9~36Vdc

## Specifications

### System Information

|                    |                                                                                                                                                                                                                                  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor          | Intel® Core™ Ultra Processor Meteor Lake-U<br>Intel® Core™ Ultra 7 Processor 165U (By project)<br>Intel® Core™ Ultra 7 Processor 155U<br>Intel® Core™ Ultra 5 Processor 135U (By project)<br>Intel® Core™ Ultra 5 Processor 125U |
| System Memory      | 2 x 262-pin SODIMM socket Max. up to 64GB DDR5 5600MT/s                                                                                                                                                                          |
| BIOS Information   | AMI uEFI BIOS 256 Mbit SPI Flash ROM                                                                                                                                                                                             |
| Watchdog Timer     | H/W Reset, 1sec. ~ 65535sec.                                                                                                                                                                                                     |
| H/W Status Monitor | CPU & system temperature monitoring and Voltages monitoring                                                                                                                                                                      |
| TPM                | TPM 2.0                                                                                                                                                                                                                          |

### Expansion

|     |                                                                                                                                                                     |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| M.2 | 1 x M.2 Key-B 2242/3042/3052 support SATA3 / PCIe Gen4x1/<br>USB3.2 Gen2 and SIM slot (Internal)<br>1 x M.2 Key-E 2230 for Wi-Fi & BT Module (USB2.0 / PCIe Gen4x1) |
| IET | 1 x IET interface (1 x DDI, 4 x PCIe Gen4x1, 3 x USB2.0,<br>1 x SMBus, eSPI)                                                                                        |

### Storage

|     |                                                                                                                    |
|-----|--------------------------------------------------------------------------------------------------------------------|
| M.2 | 1 x M.2 Key-M 2280 (1 x PCIe Gen4x4), support NVMe<br>1 x M.2 Key-B 2242, support SATA (share with expansion slot) |
|-----|--------------------------------------------------------------------------------------------------------------------|

### Front I/O

|                           |                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------|
| Power Button              | 1 x Push Button for Power on/off                                                                 |
| Reset Button              | 1 x Push Button for Reset                                                                        |
| LED Indicator             | 1 x Power LED (Blue)<br>1 x Storage LED (Yellow)<br>1 x LTE LED (Green)<br>1 x Wi-Fi LED (Green) |
| USB                       | 2 x USB2.0                                                                                       |
| COM Port                  | 2 x COM RS232/422/485 (select via BIOS, auto flow control via HW)                                |
| Digital I/O               | 1 x 8-bit GPIO (DB9)                                                                             |
| Wire-Control Power On/Off | 1 x 2-Pin Terminal Block for wire-control power on/off                                           |
| Antenna                   | 2 x Antenna with dust cover                                                                      |

### Rear I/O

|             |                                        |
|-------------|----------------------------------------|
| USB         | 4 x USB 3.2 Gen.1 (5Gbps) (w/ USB 2.0) |
| LAN Port    | 2 x RJ-45                              |
| Audio       | 1 x Mic-In, 1 x Line-Out               |
| DP          | 1 x DP++                               |
| HDMI        | 2 x HDMI                               |
| Antenna     | 2 x Antenna with dust cover            |
| AC/DC Input | 1 x 3-Pin Terminal Block (V+, V-, GND) |

### Right I/O & Left I/O

|         |                             |
|---------|-----------------------------|
| Antenna | 2 x Antenna with dust cover |
|---------|-----------------------------|

### Display

|                 |                                                                                    |
|-----------------|------------------------------------------------------------------------------------|
| Graphic Chipset | Intel® Graphics                                                                    |
| Resolution      | DP++ : Max. resolution 4096x2304 @ 60Hz<br>HDMI : Max. resolution 4096x2304 @ 60Hz |

### Audio

|             |                          |
|-------------|--------------------------|
| Audio Codec | Realtek ALC888S HD codec |
|-------------|--------------------------|

### Ethernet

|               |                                     |
|---------------|-------------------------------------|
| LAN Chipset   | 2 x Intel I226-IT                   |
| Specification | 2 x 10/100/1000/2.5G GbE compatible |

### Power Requirement

|                     |                                                                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Voltage Input Spec. | DC in typical 12/24V (+9V ~ +36V), wide voltage single power input<br>TVS component for surge protection<br>Reverse current/voltage protection (Max. Currenncy: 13A) |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                         |                             |
|-------------------------|-----------------------------|
| Voltage Input Connector | 1 x 3-pin Phoenix connector |
|-------------------------|-----------------------------|

|      |                                                           |
|------|-----------------------------------------------------------|
| ACPI | Single power ATX Support S0, S4, S5<br>ACPI 5.0 Compliant |
|------|-----------------------------------------------------------|

|            |                                 |
|------------|---------------------------------|
| Power Mode | AT/ATX (ATX is default setting) |
|------------|---------------------------------|

### Software Support

|    |                        |
|----|------------------------|
| OS | Win 10 / Win 11/ Linux |
|----|------------------------|

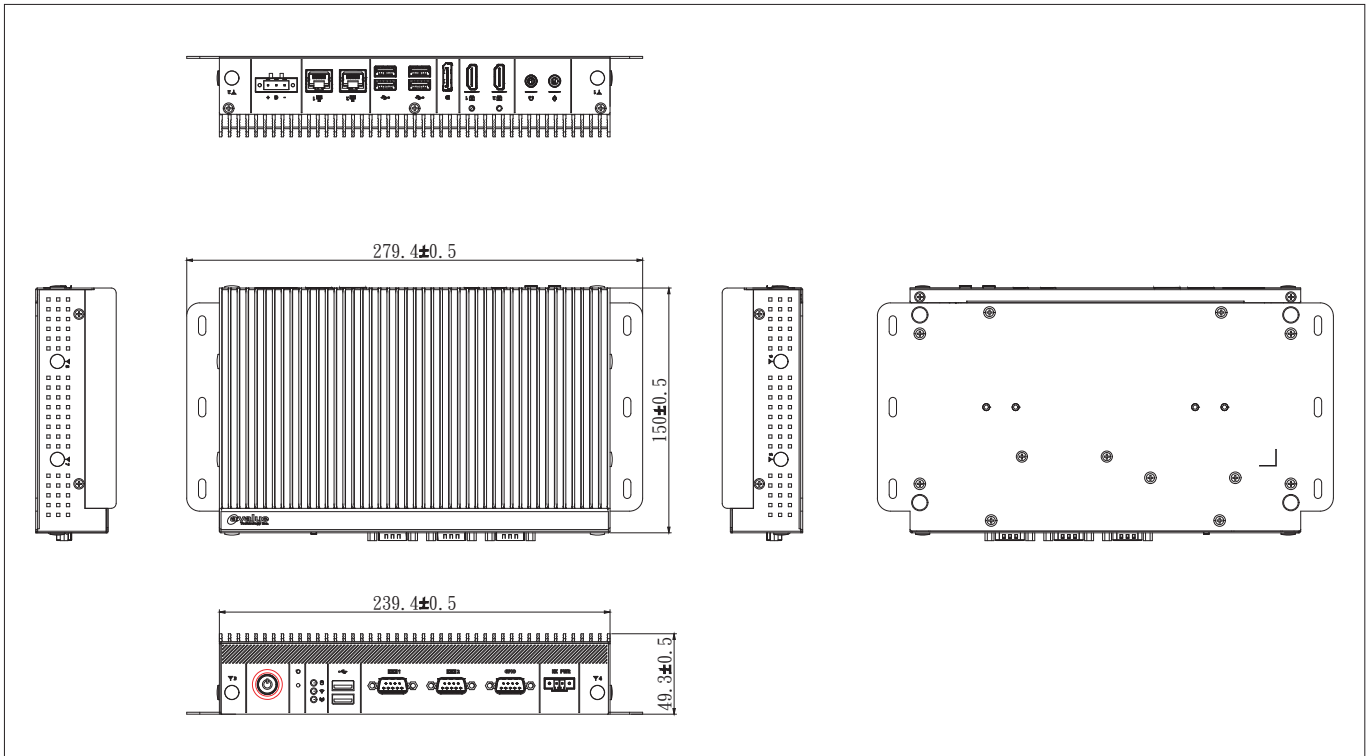
### Certification

|                           |                     |
|---------------------------|---------------------|
| Certification Information | CE, FCC Class B, KC |
|---------------------------|---------------------|

### Mechanical & Environmental

|                       |                                                                                                                              |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------|
| Operating Temp.       | -40°C ~ 65°C (w/SSD) ambient air flow (w/ 32G DDR5)<br>-40°C ~ 60°C (w/SSD) ambient air flow (w/ 64G DDR5, Maximum capacity) |
| Storage Temp.         | -30°C ~ 70°C (-22°F ~ 158°F)                                                                                                 |
| Operating Humidity    | 40°C @ 95% Relative Humidity, Non-condensing                                                                                 |
| Dimension (W x L x H) | 240mm x 150mm x 49 mm (Standard)<br>240mm x 150mm x 75 mm (w/ IET module)                                                    |
| Weight                | 2.1 kg (System), 2.9 kg (w.Package)                                                                                          |
| Vibration Test        | With SSD : 2Grms, IEC 60068-2-64, Random, 5 ~ 500Hz, 0.5hr/axis                                                              |
| Shock Test            | With SSD : 55Grms, IEC 60068-2-27, Half Sine, 11ms                                                                           |
| IP Rating             | IP 50                                                                                                                        |
| Mounting Kit          | Wall mount (standard), Din rail (optional)                                                                                   |

## Mechanical Drawing



## Ordering Information

| P/N                               | Processor                           | Memory                        | Storage    | Adapter/ PSU            | Mounting Kit                   | Temp.        |
|-----------------------------------|-------------------------------------|-------------------------------|------------|-------------------------|--------------------------------|--------------|
| EMS-MTU-U7-A1-1R                  | Intel® Core™ Ultra 7 Processor 155U | 8GB DDR5 (Up to 64G Optional) | (Optional) | 120W Adapter (Optional) | Wall Mount (Din Rail Optional) | -40°C ~ 65°C |
| EMS-MTU-U5-A1-1R                  | Intel® Core™ Ultra 5 Processor 125U | 8GB DDR5 (Up to 64G Optional) | (Optional) | 120W Adapter (Optional) | Wall Mount (Din Rail Optional) | -40°C ~ 65°C |
| EMS-MTU-U7E-A1-1R<br>(By Project) | Intel® Core™ Ultra 7 Processor 165U | 8GB DDR5 (Up to 64G Optional) | (Optional) | 120W Adapter (Optional) | Wall Mount (Din Rail Optional) | -40°C ~ 65°C |
| EMS-MTU-U5E-A1-1R<br>(By Project) | Intel® Core™ Ultra 5 Processor 135U | 8GB DDR5 (Up to 64G Optional) | (Optional) | 120W Adapter (Optional) | Wall Mount (Din Rail Optional) | -40°C ~ 65°C |

## Packing List

| Item                                                                          | Quantity |
|-------------------------------------------------------------------------------|----------|
| Intel® Meteor Lake-U Core™ Ultra 7/5 Processor Fanless Rugged Embedded System | 1        |
| Terminal block to lockable DC Jack cable                                      | 1        |
| DP to VGA converter                                                           | 1        |
| Wire tie for HDMI                                                             | 2        |
| Screw kits for peripheral                                                     | 1        |
| Thermal pad kits for memory and M.2 NVMe SSD                                  | 1        |

## Optional Items

| Item                                             | P/N              |
|--------------------------------------------------|------------------|
| AC/DC adapter 12V/10A 90 Screw Type              | ACC-ADP-120N-07R |
| Power Cord 3P (F)-3P (M) 183cm, USA type         | E1702031833R     |
| Power Cord SL-6+SL-3 183cm, EU type              | E1702031000R     |
| Power Cord 3P (F)-3P (M) 183cm, Japan w/PSE type | E1702031834R     |
| Power Cord QP-026+SL-3 183cm, UK type            | E170P060380R     |
| Power Cord 3P (F)-3P (M) 183cm, Australia type   | E1702031831R     |
| Din Rail Kit                                     | ACC-EMS-DIN-01R  |

## I/O Overview

