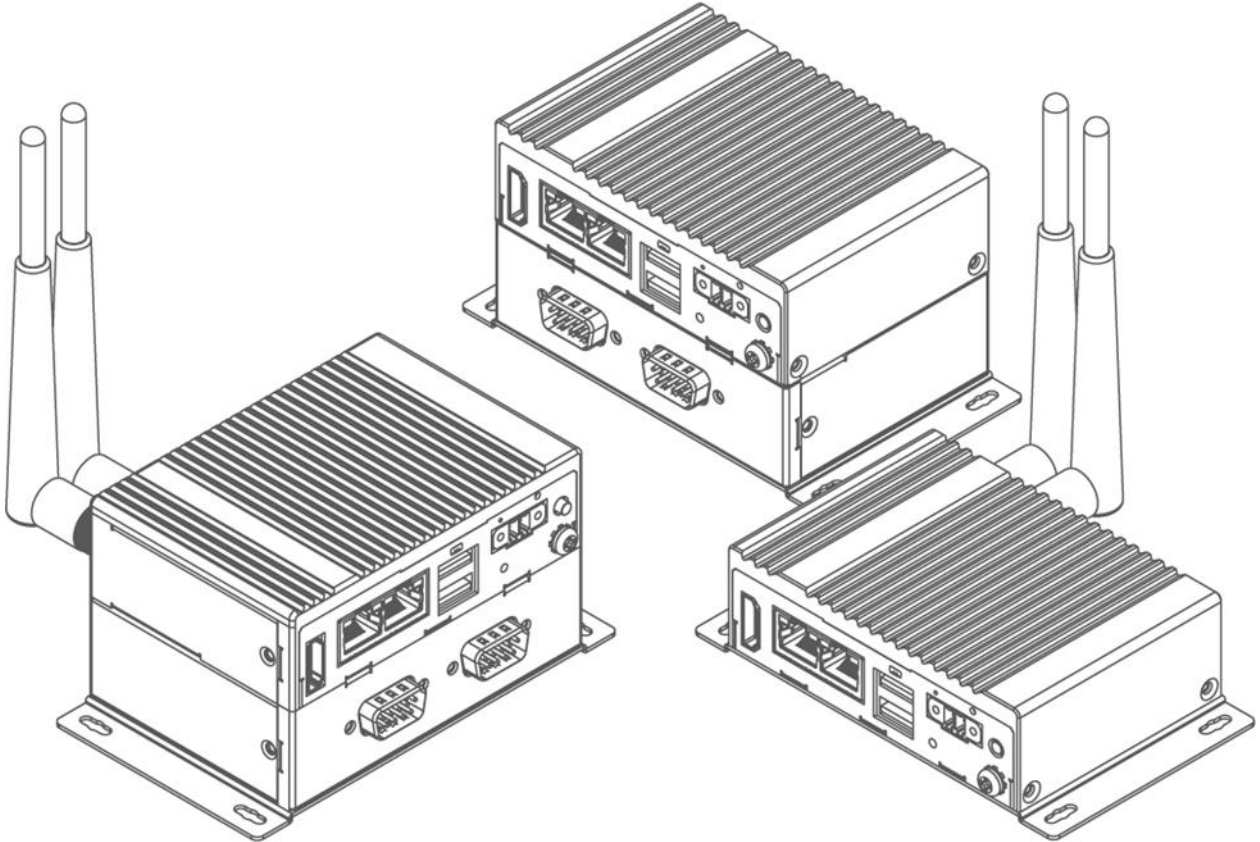


IoT Gateway

A53 Quad-core 2.0 GHz



EAC Mini EACIM20

Quick Start Guide

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Preface

Copyright Notice

No part of this document may be reproduced, copied, translated, or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the prior written permission of the original manufacturer.

Trademark Acknowledgement

Brand and product names are trademarks or registered trademarks of their respective owners.

Disclaimer

We reserve the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. We assume no responsibility or liability for the use of the described product(s) conveys no license or title under any patent, copyright, or masks work rights to these products, and make no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. We make no representation or guarantee that such application will be suitable for the specified use without further testing or modification.

Warranty

Our warranty guarantees that each of its products will be free from material and workmanship defects for a period of one year from the invoice date. If the customer discovers a defect, we will, at his/her option, repair or replace the defective product at no charge to the customer, provide it is returned during the warranty period of one year, with transportation charges prepaid. The returned product must be properly packaged in its original packaging to obtain warranty service. If the serial number and the product shipping data differ by over 30 days, the in-warranty service will be made according to the shipping date. In the serial numbers the third and fourth two digits give the year of manufacture, and the fifth digit means the month (e. g., with A for October, B for November and C for December).

For example, the serial number 1W21Axxxxxxx means October of year 2021.

Customer Service

We provide a service guide for any problem by the following steps: First, visit the website of our distributor to find the update information about the product. Second, contact with your distributor, sales representative, or our customer service center for technical support if you need additional assistance.

You may need the following information ready before you call:

- Product serial number
- Software (OS, version, application software, etc.)
- Detailed description of the problem
- The exact wording of error messages

In addition, free technical support is available from our engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Advisory Conventions

Four types of advisories are used throughout the user manual to provide helpful information or to alert you to the potential for hardware damage or personal injury. These are Notes, Important, Cautions, and Warnings. The following is an example of each type of advisory.



Note:

A note is used to emphasize helpful information



Important:

An important note indicates information that is important for you to know.



Caution

A Caution alert indicates potential damage to hardware and explains how to avoid the potential problem.



Warning!

An Electrical Shock Warning indicates the potential harm from electrical hazards and how to avoid the potential problem.



Alternating Current

The Protective Conductor Terminal (Earth Ground) symbol indicates the potential risk of serious electrical shock due to improper grounding.

Safety Information



Warning!

Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.



Warning!

During heavy loading in 50°C environment, the top side of the EAC Mini may be over 70°C. Please do not touch these parts with your bare hands.



Caution

Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

Safety Precautions

For your safety carefully read all the safety instructions before using the device. All cautions and warnings on the equipment should be noted. Keep this user manual for future reference.



Note:

Pictures in this guide are samples and can differ from actual product.



Caution

Do not cover the openings!

Let service personnel to check the equipment in case any of the following problems appear:

- The power cord or plug is damaged.
- Liquid has penetrated into the equipment.
- The equipment has been exposed to moisture.
- The equipment does not work well or you cannot get it to work according to the user manual.
- The equipment has been dropped and damaged.
- The equipment has obvious signs of breakage.
- Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20°C (-4°F) or above 60°C (140°F). It may damage the equipment.



Caution

Use the recommended mounting apparatus to avoid risk of injury.



Warning!

Only use the connection cords that come with the product. When in doubt, please contact the manufacturer.



Warning!

Always ground yourself against electrostatic damage to the device.

Important Information

Federal Communications Commission Radio Frequency Interface Statement

This device complies with part 15 FCC rules.



Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "B" digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at him own expense.

European Union

This equipment is in conformity with the requirement of the following EU legislations and harmonized standards. Product also complies with the Council directions.

Electromagnetic Compatibility Directive (2014/30/EU)



- EN55024: 2010+A1: 2015
 - IEC61000-4-2: 2009
 - IEC61000-4-3: 2006+A1: 2007+A2: 2010
 - IEC61000-4-4: 2012
 - IEC61000-4-5: 2014
 - IEC61000-4-6: 2014
 - IEC61000-4-8: 2010
 - IEC61000-4-11: 2004
- EN 55032: 2015+AC: 2016
- EN61000-3-2:2014
- EN61000-3-3:2013

Low Voltage Directive (2014/35/EU)

EN 60950-1:2006/A11:2009/A1:2010/A12:2011/ A2:2013

Chapter 1: Introduction

Congratulations on purchasing Winmate® EAC Mini EACIM20 IoT Gateway.

The EAC Mini EACIM20 is an ARM-based industrial IoT gateway with low power consuming ARM A53 Quad Core 2.0GHz processing and excellent expansion possibilities. Expansion modules offers rich options for additional serial interfaces such as CANBus, DIO, WLAN and 4G LTE. Wireless connectivity and all necessary connectors support the EAC mini (EACIM20) to send data from manufacturing facilities directly to cloud servers. This ARM-based IoT gateway features Android or Linux Yocto operating system choices. Compact size and rich expansion options makes the The EACIM20 IoT Gateway is suitable for IoT, smart factory and machine automation applications.

1.1 Features

Winmate® EAC Mini IoT Gateway offers the following features:

- ARM A53 Quad Core 2.0GHz
- Fanless cooling system
- Compact size 100 x 70 x 31 mm (w/o mounting bracket)
- Various mounting options: desk, wall, VESA, DIN-Rail
- Microsoft Azure Certified for IoT

1.2 Expansion Module

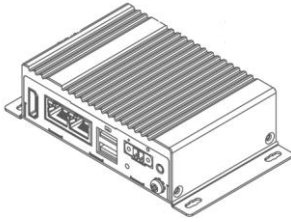
15+ combinations:

- 3-port RS232/422/485 w/ isolation
- 16-Channel Digital I/O w/ isolation
- 2-port CANBUS w/ isolation
- 3 -port USB 2.0
- 2-port RS232/422/485 w/ isolation

1.3 Package Contents

Carefully remove the box and unpack your device. Please check if all the items listed below are inside your package. If any of these items are missing or damaged contact us immediately.

Standard factory shipment list:



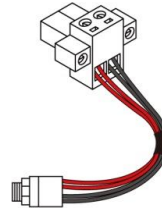
**EAC Mini
IoT Gateway**

Varies by product
specifications



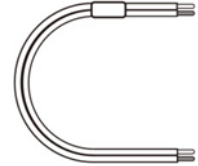
**Quick Start Guide
(Hardcopy)**

Part No. 91521110109P



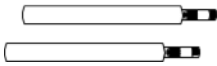
**Terminal Block
2 pin to 2.5Ø Female
Adapter Cable**

Part No. 94J602G020K2



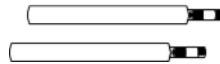
Open Wire Cable

Part No. 94EL02X020E0



**WLAN External
Antenna (For WLAN
SKU)**

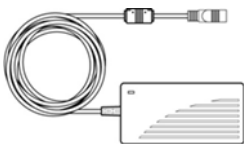
Part No. 397SM000000Q



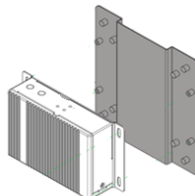
**WWAN/BT External
Antenna (For
WWAN/BT SKU)**

Part No. 397SM000000S

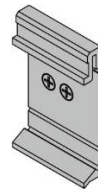
Optional accessories:



- **AC Adapter
12V/ 36W**
Part
No.922D036W12V6



- **VESA Mount Kit**
Part No.
98K000A0009A



- **DIN Rail Mount Kit**
Part No.
98K000A00099

1.4 Hardware Specifications

| | | Model Name |
|--------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | EACIM20 |
| System Specification | Processor | ARM A53 Quad Core 2.0GHz |
| | Operating System | Android 11 (Upgradeable to Android 13) Linux Yocto 5.10.104 with QT 5.15 (Optional) Linux Ubuntu (Optional) |
| | Memory | 4 GB LPDDR4 |
| | Storage | eMMC: Onboard 32 GB |
| | WLAN | Support (Optional) |
| | WWAN | 4G/LTE (Optional) |
| | BT | Support for Android (Optional) |
| | Security | SOTI MobiControl Compliance |
| | Expansion Port | EACWSLT-231 3-port RS232/422/485 w/ isolation EACWSLT-232 16-Channel Digital I/O w/ isolation EACWSLT-233 2-port CANBUS w/ isolation EACWLST-234 3-port USB 2.0 EACWLST-235 2-port RS232/422/485 w/ isolation |
| IO Ports | Power Input | 1 x 9-36V DC, 2-Pin Terminal Block |
| | USB Port | 2 x USB2.0 (Type-A) 1 x USB2.0 OTG (Micro USB), support Android Debug Bridge (adb) |
| | LAN | 2 x Giga LAN RJ45 Connector for Linux 1 x Giga LAN RJ45 Connector for Android |
| | Video | 1 x HDMI (Up to 1080p/30Hz) (Optional) |
| | Expansion Port | 1 x M.2 slot 2 x USB Wafer |
| | Indicator | 1 x LED Indicator for power |
| Control | Button | 1 x Power Button 1 x Reset Button |
| Mechanical Specification | Dimension | 100 (W) x 70 (H) x 31(D) mm(One layer) 100 (W) x 70 (H) x 61(D) mm(Double layer) |
| | Weight | 0.4 kg (One layer) 0.5 kg (Double layer) |
| | Mounting | Desk Mounting (Default), Wall Mounting (Default), VESA Mounting (Optional), DIN-Rail Mounting (Optional) |
| | Cooling | Fanless design |
| Environment | Operating Temp. | 0~55° C |
| | Storage Temp. | -15~70° C |
| | Operating Humidity | 30~90% RH |
| | Shock | Operating, IEC 60068-2-27 |
| | Vibration | Operating, IEC 60068-2-64 |
| | IP Rating | IP30 |
| Certification | Certification | CE, FCC Microsoft Azure Certified for IoT |
| Accessory | Accessory | Terminal Block 2 pin to 2.5Ø Female Adapter Cable |

| | | |
|-----------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | Quick Start Guide Open Wire Cable WLAN External Antenna*2 (For WLAN sku) WWAN External Antenna*2 (For WWAN sku) BT External Antenna*1 (For BT sku) |
| | Optional Accessory | AC to DC Adapter 12V/36W (Optional) VESA Mount Kit (Optional) DIN Rail Mount Kit (Optional) Micro USB to Type A Cable (Optional) |
| Power | Power Rating | 9V~36V DC, 2-Pin Terminal Block |
| | Adapter | 12V 36W (Optional) |
| Ordering Information | Option | EACIM20-100 Standard SKU EACIM20-101 with WLAN and BT SKU (Optional) EACIM20-102 with WWAN SKU (Optional) EACIM20-103 with WLAN, BT and WWAN SKU (Optional) EACWSLT-231 3-port RS232/422/485 w/ isolation (Optional) EACWSLT-232 16-Channel Digital I/O w/ isolation (Optional) EACWSLT-233 2-port CANBUS w/ isolation (Optional) EACWSLT-234 4-port USB 2.0 (Optional) EACWSLT-235 2-port RS232/422/485 w/ isolation (Optional) |

NOTE:

1. This is simplified drawing and some components are not marked in detail.
2. Please contact our sales representative if you need further product information.
3. The Android OS option of EACIM20 only supports 1 x LAN.
4. The product shown in this datasheet is a standard model. For diagrams that contain customized or optional I/O, please contact the Winmate Sales Team for more information.
5. Default resolution of HDMI: 1280x 800 with 160 DPI.
6. The power key is only available in Android operating system.

1.5 Description of Parts

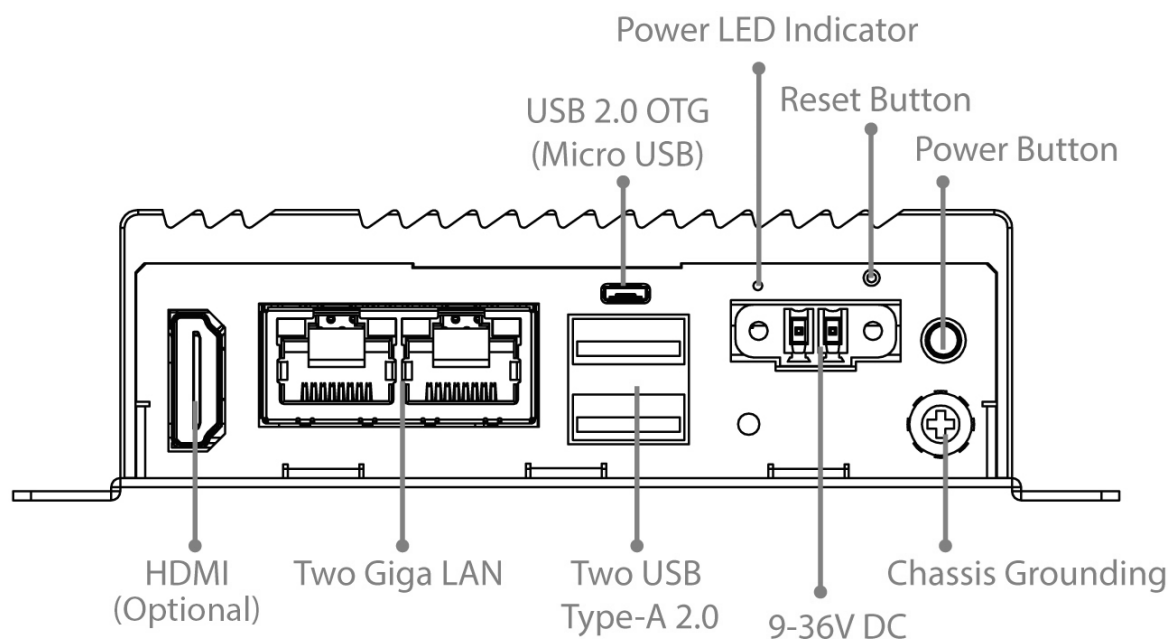
This section includes front and rear side I/O ports location of the EAC Mini EACIM20 IoT Gateway.



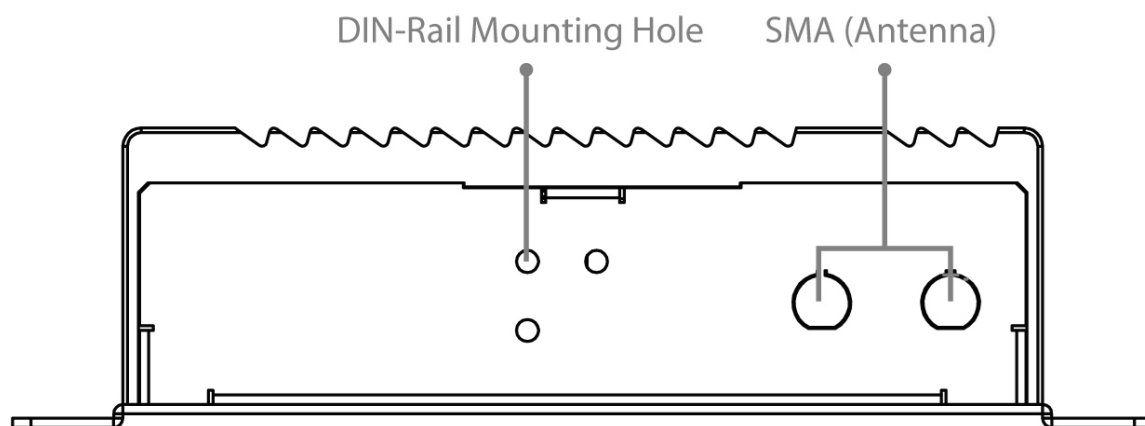
Note:

Optional antennas position will be different per SKU. Please refer to the Appendix A: Order Information

Front Side



Rear Side



1.6 LED Indicators

The EAC Mini IoT Gateway provides one HDD and one Power LED indicators located on the front for status monitoring.

| LED Type | Status | Description |
|----------|--------|--------------|
| Power | On | Power is on |
| | Off | Power is off |

Chapter 2: Mounting

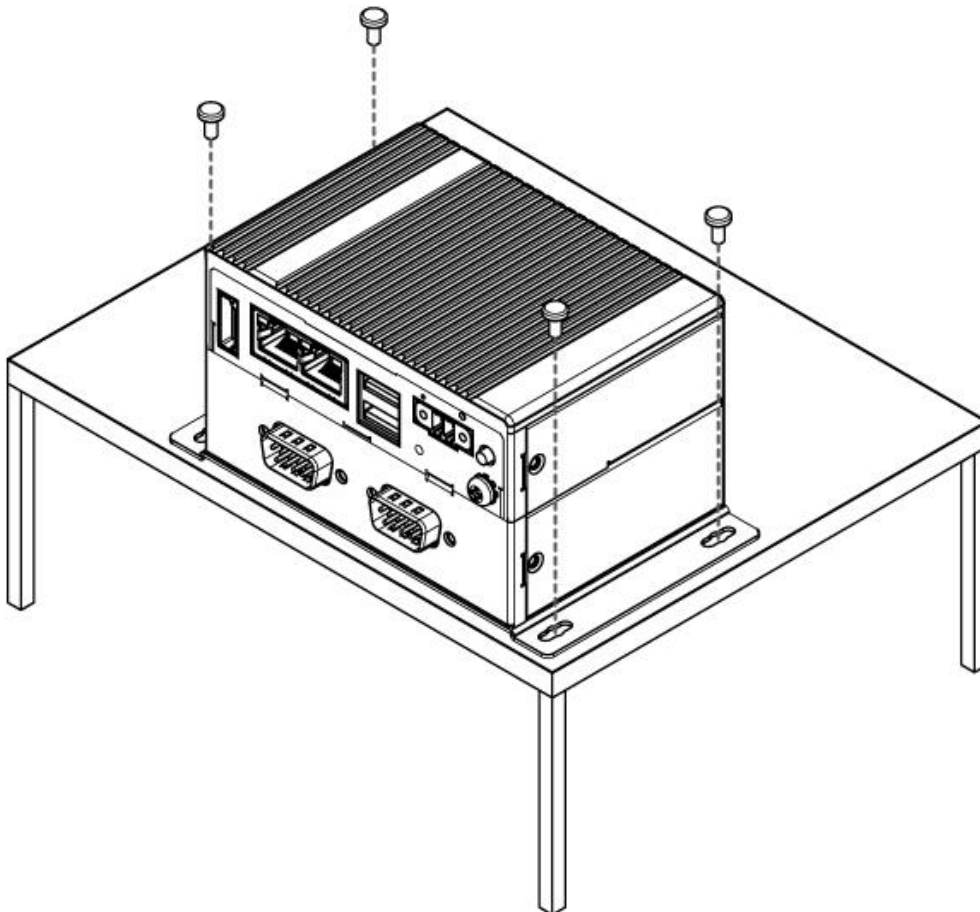
The EAC Mini supports five types of mounting: wall and desk mounting by default, and optional VESA, DIN-rail, Pole mounting solutions. You can purchase mounting kit from Winmate as an optional accessory.

2.1 Wall/ Desk Mount

L-shape mounting brackets for wall/ desk mounting are supplied with the EAC Mini. Before mounting the unit to the wall, attach L-shape mounting brackets to the EAC Mini (supplied by Winmate).

Mounting Instruction:

- 1 Place the EAC Mini on the fixture (ex. table) and fasten four M3 screws to secure the unit to the fixture.



2.2 DIN-Rail Mount

You can purchase DIN-Rail mounting kit from Winmate as an optional accessory.

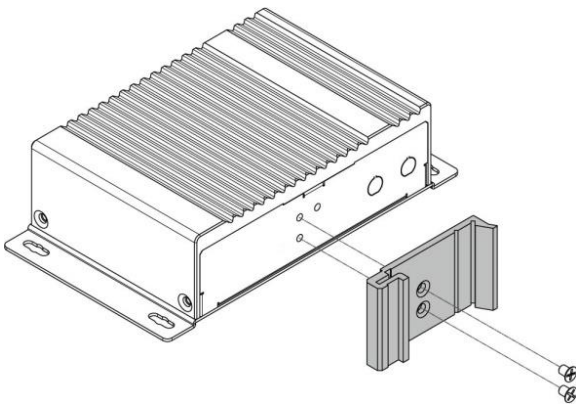
DIN-Rail Mounting Kit

Part No. 821118551400 / 98K000A00099

Mounting Instruction:

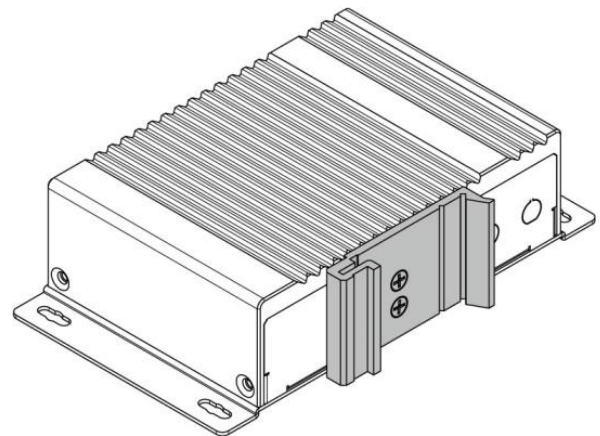
- 1 Fasten screws to secure DIN-rail mounting bracket to the EAC Mini.

Rear Side

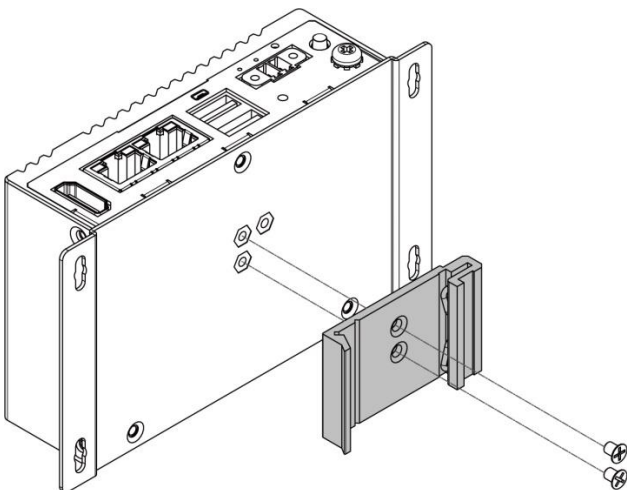


- 2 Place the EAC Mini with the DIN-Rail bracket on the DIN-Rail.

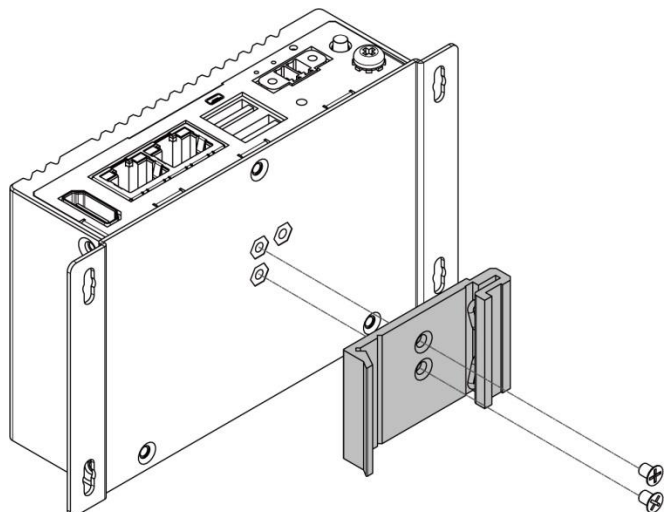
Rear Side



Bottom Side



Bottom Side



2.3 VESA Mount

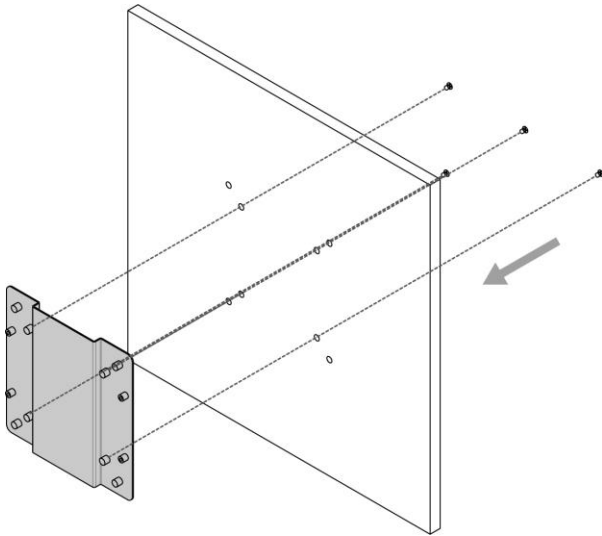
You can purchase VESA mounting kit from Winmate as an optional accessory.

VESA Mounting Kit

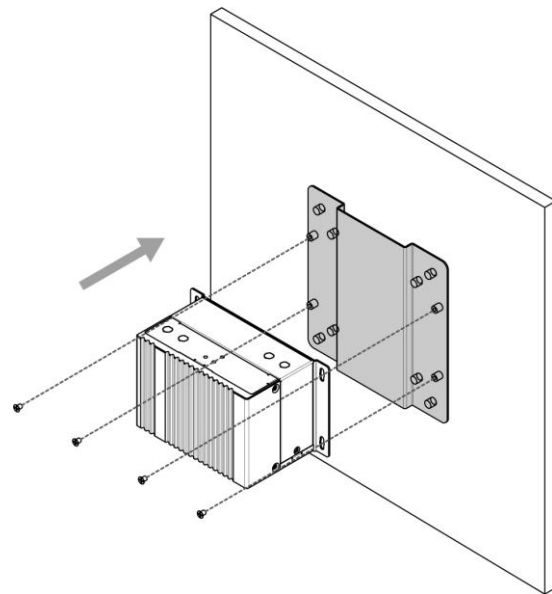
Part Number: 821118561001 / 98K000A0009A

Mounting Instruction:

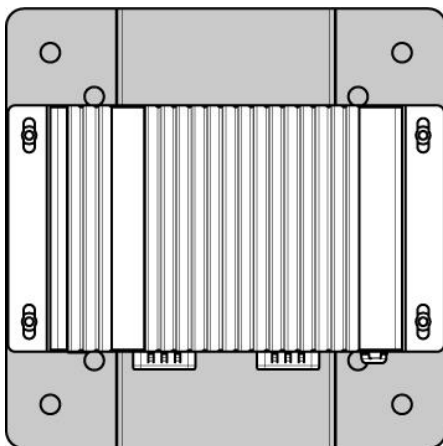
- ① Mark the location of the screw holes on the fixture (ex. wall). Align the VESA mounting bracket with the screw location and screw VESA plate from the rear side of the fixture.



- ② Place the EAC Mini on the VESA mounting bracket and fasten screws to secure and the EAC Mini to the VESA plate.



- ③ You have completed VESA mounting installation. Connect other peripherals if needed.



Chapter 3: Hardware Installation

This section explains how to install hardware on the EAC Mini EACIM20.



Caution

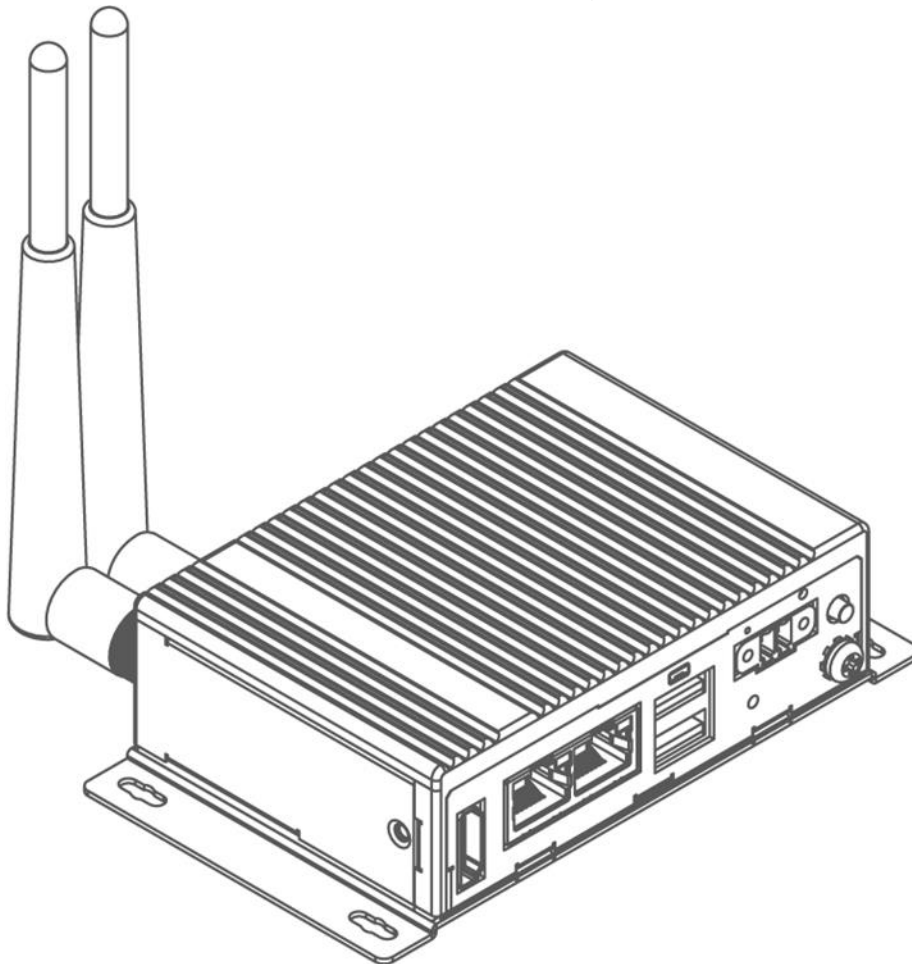
Always remove the power cord before installing the hardware.

3.1 External Antenna Installation

Notice that external antenna is an optional feature of the EAC Mini EACIM20.

To install external SMA antenna:

1. Remove the rubber cap on the SMA connector before installing the antenna.
2. Align the antenna with the SMA connector located on the rear side of the EAC Mini and fasten it as shown on the picture.
3. Adjust the position of external antenna for better signal.

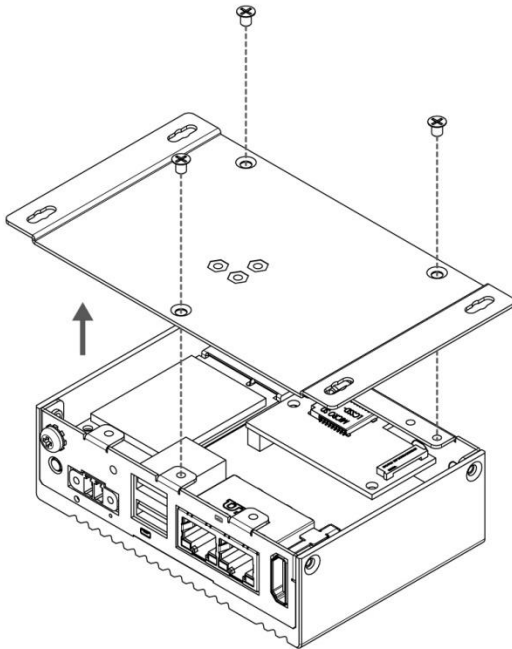


3.2 Expansion Module Installation

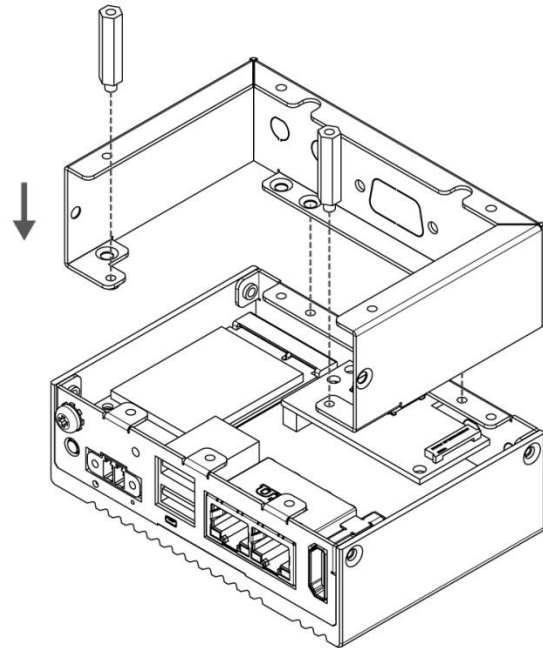
Notice that expansion module is an optional feature of the EAC Mini EACIM20.

To install expansion module:

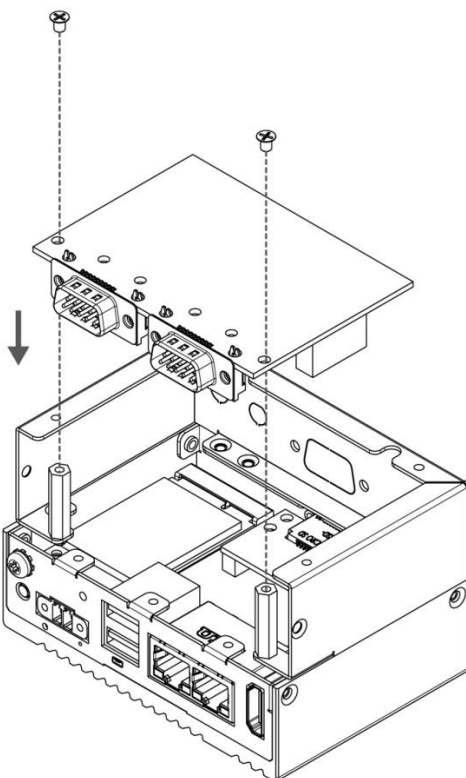
- ❶ Unscrew the three screws, and remove the bottom cover.



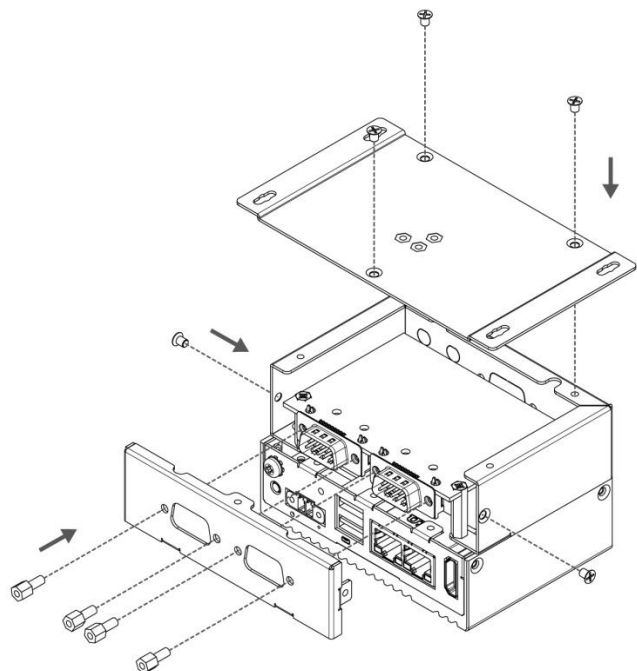
- ❷ Attach the 2nd layer module bracket and install four copper pillars



- ❸ Attach the 2nd layer I/O module, and fasten four screws.

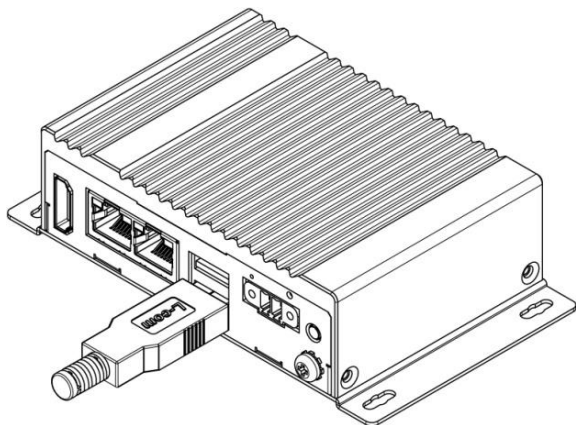


- ❹ Fasten three screws to screw back the bottom cover, fasten two screws on the side of the module bracket and fasten copper pillars/screws in front to secure I/O module.

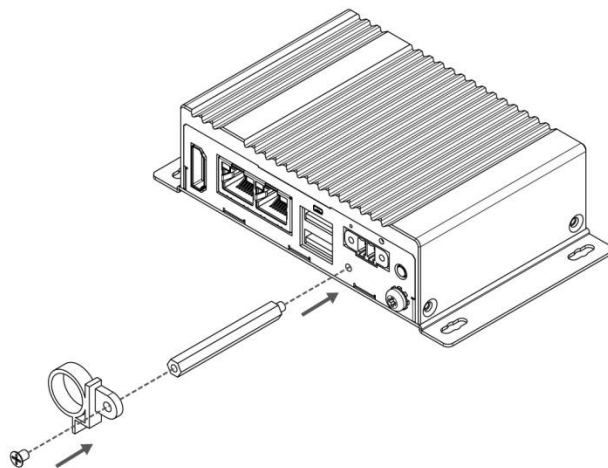


3.3 USB Wire Loop Installation

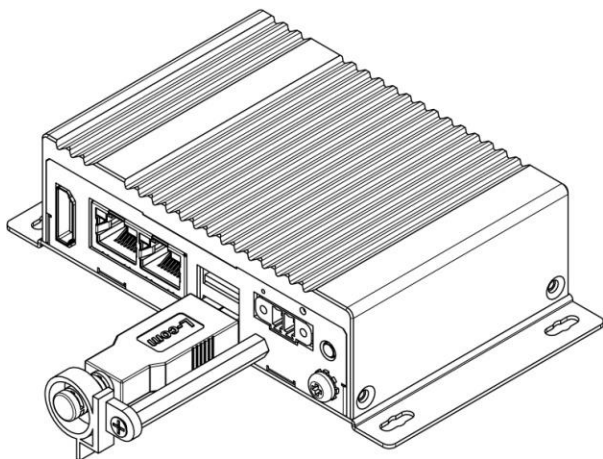
❶ Insert USB to the USB slot.



❷ Install copper pillar, USB wire loop, and fasten one screw to secure the USB to the EAC Mini EACIM20.



❸ You have finished the USB Wire Loop installation.



3.4 Connecting the Power

The DC power supply connector of the EAC Mini IoT Gateway is on the front panel. The DC power input for the EAC Mini allows a voltage input range from 9 V DC to 36 V DC.



Warning!

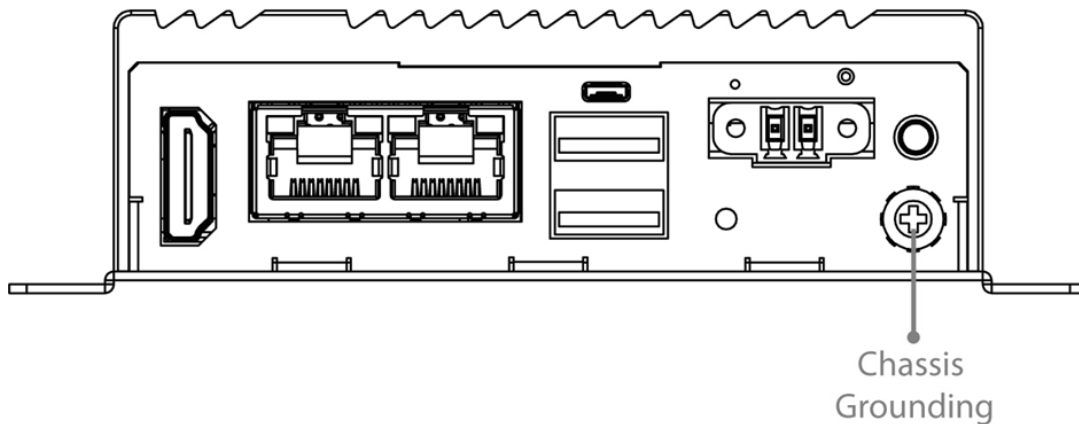
Ensure voltage and polarity is compliant with the DC input. Improper input voltage or polarity can cause system damage.

3.4.1 Connecting the Power

Connect EAC Mini to 9-36V DC. The power source can either be from a power adapter or an in-house power source.

3.4.2 Chassis Grounding

EAC Mini provides EMI protection and a stable grounding base. Use chassis grounding point located on the front.



3.5 External Connectors

The following sections give you information about EAC Mini EACIM20 standard connectors and pin assignments.

3.5.1 HDMI Connector

Plug HDMI signal cable to the HDMI connector of the EAC Mini EACIM20, and plug the other end to the monitor.

Pin assignment and signal names of HDMI connector

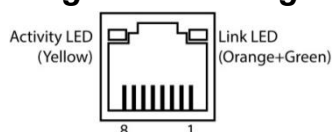


| Pin № | Signal Name | Pin № | Signal Name |
|-------|----------------|-------|--------------|
| 1 | HDMI_RX2+ | 2 | GND |
| 3 | HDMI_RX2- | 4 | HDMI_RX1+ |
| 5 | GND | 6 | HDMI_RX1- |
| 7 | HDMI_RX0+ | 8 | GND |
| 9 | HDMI_RX0- | 10 | HDMI_RXC+ |
| 11 | GND | 12 | HDMI_RXC- |
| 13 | HDMI_CON_CEC | 14 | NC |
| 15 | HDMI_CON_SCL | 16 | HDMI_CON_SDA |
| 17 | HDMI_CON_CABLE | 18 | +5V_HDMI |
| 19 | HDMI_CON_HP | | |

3.5.2 Ethernet Connector

The EAC Mini EACIM20 has two Ethernet connectors located on the front. Ethernet ports provide a standard RJ45 10/100/1000 Mbps jack connector with LED indicators on the front side to show its Active/ Link status and Speed status.

Pin assignment and signal names of Ethernet connector



10/100 Mbps- Green
1G Mbps – Orange

| Pin № | Signal Name | Pin № | Signal Name |
|-------|-------------|-------|-------------|
| 1 | TX1+ | 2 | TX1- |
| 3 | TX2+ | 4 | TX3+ |
| 5 | TX3- | 6 | TX2- |
| 7 | TX4+ | 8 | TX4- |

3.5.3 USB 2.0 Connector

The EAC Mini EACIM20 provides two USB 2.0 connectors. Use USB 2.0 connector to connect external devices such as mouse or keyboard to the box computer.

Pin assignment and signal names of USB connector

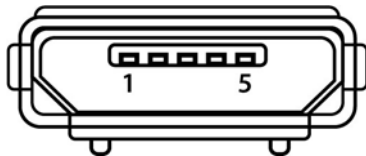


| Pin № | Signal Name | Pin № | Signal Name |
|-------|-------------|-------|-------------|
| 1 | +5V | 2 | USB_D- |
| 3 | USB_D+ | 4 | GND |
| 5 | STDA_SSRX- | 6 | STDA_SSRX+ |
| 7 | GND | 8 | STDA_SSTX- |
| 9 | STDA_SSTX+ | | |

3.5.4 USB 2.0 OTG Connector

The EAC Mini EACIM20 provides one USB 2.0 OTG (Micro USB) connector. Use USB 2.0 OTG connector to install software updates.

Pin assignment and signal names of USB OTG connector



| Pin № | Signal Name | Pin № | Signal Name |
|-------|-------------|-------|-------------|
| 1 | +5V | 2 | USB_OTG_D- |
| 3 | USB_OTG_D+ | 4 | USB_OTG_ID |
| 5 | GND | | |

3.5.5 Power Connector

DC power source input is a 2 pin terminal block connector. Power Input is 9V to 36V DC in.



Appendix

Appendix A: Order Information

EAC Mini EACIM20 IoT Gateway available in the following configurations:

| Model Name | Configuration |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| EACIM20-100 Standard SKU | A53 Quad-core, 4G RAM, 32GB eMMC, 1 x USB 2.0 OTG, 2 x USB 2.0, 2 x GbE LAN, 1 x HDMI, 9-36 V DC. |
| EACIM20-101 with WLAN and BT SKU | A53 Quad-core, 4G RAM, 32GB eMMC, 1 x USB 2.0 OTG, 2 x USB 2.0, 2 x GbE LAN, 1 x HDMI, 9-36 V DC, WLAN, and BT. |
| EACIM20-102 with WWAN SKU | A53 Quad-core, 4G RAM, 32GB eMMC, 1 x USB 2.0 OTG, 2 x USB 2.0, 2 x GbE LAN, 1 x HDMI, 9-36 V DC, WWAN. |
| EACIM20-103 with WLAN, BT and WWAN SKU | A53 Quad-core, 4G RAM, 32GB eMMC, 1 x USB 2.0 OTG, 2 x USB 2.0, 2 x GbE LAN, 1 x HDMI, 9-36 V DC, WWAN, WLAN, and BT. |

Additional order options:

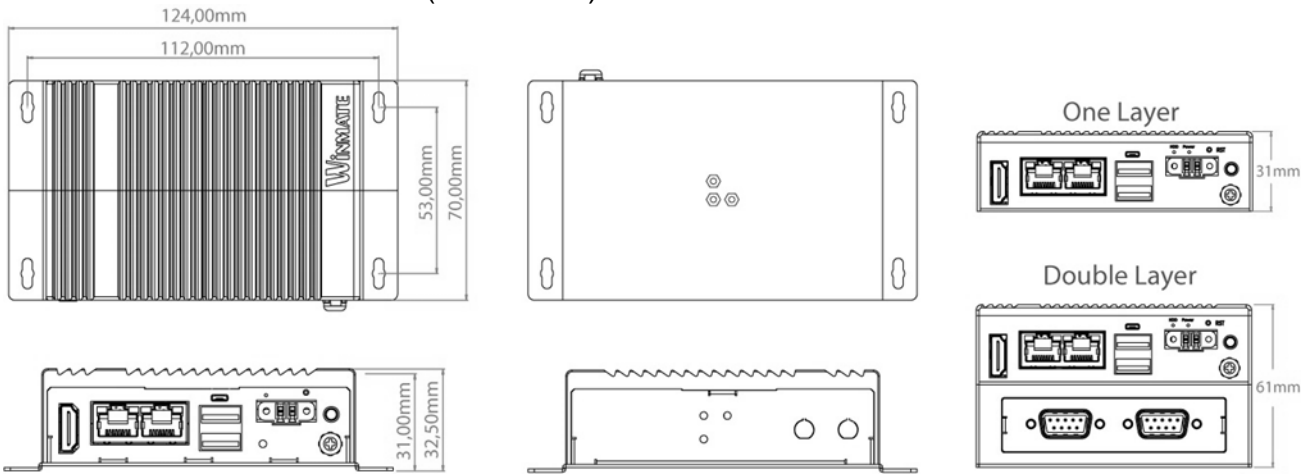
| Item | Specifications |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC Adapter | AC Adapter 12V/36W (Part No. 922D036W12V6) |
| Mounting | VESA Mounting Kit (Part No. 98K000A0009A) DIN-Rail Mounting Kit (Part No. 98K000A00099) |
| External Antenna | WLAN External Antenna (Part No. 397SM000000Q) WWAN/BT External Antenna (Part No. 39700000000S) |
| Expansion Module | EACWSLT-231 3-port RS232/422/485 w/ isolation EACWSLT-232 16-Channel Digital I/O w/ isolation EACWSLT-233 2-port CANBUS w/ isolation EACWLST-234 3-port USB 2.0 EACWLST-235 2-port RS232/422/485 w/ isolation |

Appendix B: Software Developer Support

You can download drivers and SDK from Winmate Download Center.

Appendix C: Mechanical Dimensions

All dimensions are shown in mm (millimeters).



NOTE

NOTE

