



Industrial PC

# AIO-CM5-101



PN: CS12800RA5101A

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# AIO-CM5-101

## Front View



## Rear View



## Side View 1



## Side View 2



## Product Overview

The AIO-CM5-101 all in one Raspberry Pi PC (PN: CS12800RA5101A) is an all-in-one desktop computer based on Raspberry Pi® CM5.

Its case is plastic, very light to carry around, or mount it to a fixed place as a smart home control center. The case is available in Black / White color.

This single board computer features a 10.1" IPS display with a maximum brightness of 400 cd/m<sup>2</sup>. The touch screen is a responsive capacitive screen and supports multi touch.

The product is easy to use, perfect for developers and makers accustomed to the Raspberry Pi and is looking for a computer they can use daily, it handles 1080P video streaming easily and even 4K streaming, like the Raspberry Pi 5.

It is also fully compatible with the Raspberry Pi OS.

### Key Applications

- Human Machine Interface HMI
- Edge AI
- Process Control
- Process Monitoring
- HMI
- IIoT node
- Environmental Monitoring
- PLC
- Automotive applications
- Smart Home

# Ordering Options

Chipsee products can be customized during the ordering process. The product will be shipped with the pre-installed factory defaults if no extra requirements are specified. The table in the [Hardware Features](#) section provides information about the default options bundled with the product.

## Note

You can order AIO-CM5-101 from the official [Chipsee Store](#) or from your nearest distributor.

## Pi® CM5 Module

The Pi® Compute Module 5 appears in different versions (different RAM size: 2GB, 4GB, or 8GB SDRAM based on CM5 and different eMMC size: 0GB, 16GB, 32GB, or 64GB based on CM5).

The AIO-CM5-101 all in one Raspberry Pi PC does not include the CM5 Raspberry Pi® module by default.

If you would like to purchase it with a CM5, you can select it at the Chipsee store during the ordering process.

## Operating System

This product comes with a pre-installed Raspberry Pi OS. Chipsee software engineers have created all the drivers, so every hardware feature is readily available for any standard development tool.

If your project requires a different OS, please [Contact us](#), and we'll make a [customized version](#) that suits your needs.

## Optional Features

The AIO-CM5-101 all in one Raspberry Pi PC does not include the 3G/4G/LTE/GPS module by default. This module is optional and can be selected at the Chipsee store during the ordering process.

The product has a M.2 2230/2242 M-key slot, running at PCIe 2.0 x1 speed (PCIe 3.0 is possible but experimental for CM5), you can use it with your NVMe SSD or other modules that can fit in a m.2 2230/2242 M-key slot and supports the protocol. By default the NVMe SSD is not mounted.

The product's RS232/RS485/CAN/Relay can be configured in the factory, these options are supported:

- 2 x RS232, 1 x RS485, 0 x CAN, 1 x Relay (**default**)
- 1 x RS232, 2 x RS485, 0 x CAN, 1 x Relay
- 1 x RS232, 1 x RS485, 1 x CAN, 1 x Relay
- 2 x RS232, 1 x RS485, 1 x CAN, 0 x Relay

Please contact us if you need option 2,3 or 4.

### Warning

Installation, repair, and maintenance tasks should be performed by trained personnel only. Chipsee does not bear any responsibility for damage caused by inadequate handling of the product.

# Hardware Features

The AIO-CM5-101 all in one Raspberry Pi PC offers a broad range of performance and connectivity options for scalable integration, providing expandability according to future needs.

Some of the key features are listed in the table below.

| AIO-CM5-101                 |  |
|-----------------------------|--|
| <b>CPU</b>                  | Raspberry Pi® CM5/CM5Lite; BCM2712 Quad(4) Core Cortex-A76 at 2.4GHz   |
| <b>Storage</b>              | Internal M.2 NVMe connector for SSD card (optional)  |
| <b>RAM</b>                  | 2GB, 4GB, or 8GB SDRAM based on CM5  |
| <b>eMMC</b>                 | 0GB, 16GB, 32GB, or 64GB based on CM5  |
| <b>Display</b>              | 10.1" IPS LCD, 1280 x 800 px, brightness 400 cd/m <sup>2</sup>   |
| <b>Touch</b>                | 10-point capacitive touch with 1.0mm Armored Glass   |
| <b>USB</b>                  | 2 x USB 3.0 type-A Host, 1 x USB type-C OTG  |
| <b>PCIe</b>                 | M.2 2230/2242 M-key, PCIe Gen 2.0 x 1(5Gbps) (PCIe Gen 3.0 x1 is compatible but experimental) ( <b>optional</b> )  |
| <b>LAN</b>                  | 1 x Giga LAN   |
| <b>Audio</b>                | 3.5mm Audio Out Connector, 2W Speaker Internal   |
| <b>Buzzer</b>               | Onboard Buzzer, driven by GPIO   |
| <b>RTC</b>                  | High accuracy RTC with farad capacitor, can work 1 week after power off (default). High accuracy RTC with lithium coin battery, can work 3 years after power off (optional). |
| <b>GPIO/Wiegand</b>         | ( <b>Optional</b> ) 2 x 5V Logic GPIO Outputs, can be used as Wiegand signal   |
| <b>WiFi/BT</b>              | Optional (Depends on CM5)  |
| <b>HAT Connector</b>        | N/A  |
| <b>Micro SD card socket</b> | 1 x TF(micro SD) card slot, <b>only</b> for CM5 Lite module to boot from TF  |
| <b>HDMI</b>                 | N/A  |
| <b>Power Input</b>          | 15V to 30V DC  |
| <b>Current</b>              | 800mA max at 15V, 500mA typical at 15V   |
| <b>Power Consumption</b>    | 12W Max, 7.5W typical  |
| <b>Relay</b>                | 1 x relay with "Normally Connected" and "Normally Open" output   |
| <b>RS232</b>                | 2 x RS232  |

| AIO-CM5-101                |   |
|----------------------------|---|
| <b>RS485</b>               | <b>Default</b> 1 x RS485; up to 2 x RS485 ( <b>optional</b> )   |
| <b>CAN</b>                 | <b>Default</b> 0 x CAN; <b>Optional</b> 1 x CAN FD BUS. Arbitration Bit Rate up to 1Mbps, Data Bit Rate up to 8Mbps |
| <b>3G/4G/LTE/GPS</b>       | Internal 4G/LTE module supported, not mounted by default  |
| <b>Working Temperature</b> | From -20°C to +70°C   |
| <b>OS</b>                  | Raspberry Pi OS   |
| <b>Dimensions</b>          | 260.54 x 178.54 x 26.9mm  |
| <b>Weight</b>              | 620g  |
| <b>Mounting</b>            | VESA, Stand   |
| <b>Plastic Case Color</b>  | Black / White   |
| <b>Certification</b>       | CE, ROHS  |

Table 402 Key Features

## Power Input

The AIO-CM5-101 all in one Raspberry Pi PC can be powered by an input voltage of 15V to 30V DC.

The total power consumption is about 12W Max, 7.5W typical, depending on the load and brightness.

The power input connector is a 3.4mm O.D x 1.7mm I.D x 9.5mm DC connector, the products also ships with a 3.4x1.7mm to 5.5x2.1mm connector. You can use either 3.4x1.7 or 5.5x2.1 DC power plug. For a proper DC power adapter, refer to the figure below.



*Power Input*



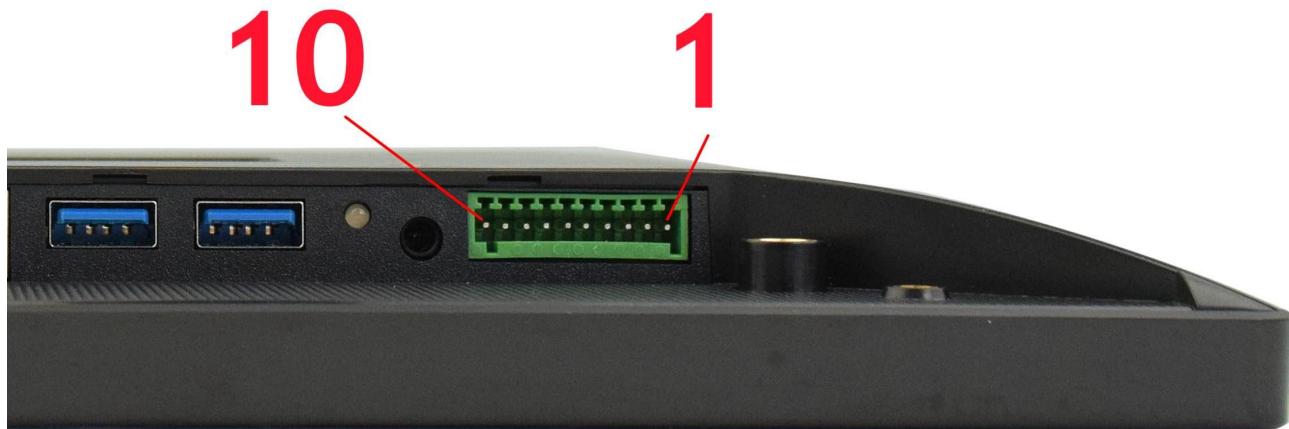
*Power Adapter*

# Connectivity

There are many connectivity options available on the AIO-CM5-101 industrial Pi PC. It has 2 x USB 3.0 type-A Host, 1 x USB type-C OTG, 1 x Giga LAN (RJ45) Ethernet connector supporting up to 1 Gbps.

## RS232/RS485/Relay Connector

The serial communication interfaces (RS485, RS232, and Relay) are routed to a **10-pin 2.5mm connector**, as illustrated on the figure below.



*RS232/RS485/Relay Connector*

The table below offers more detailed description of every pin and its definition:

| RS232 / RS485 / Relay Pin Definition: |             |   |              |
|---------------------------------------|-------------|---|--------------|
| Pin Number                            | Definition  | Description   | OS Node      |
| Pin 1                                 | GND         | System Ground   |              |
| Pin 2                                 | RS232_0_RXD | CPU UART0, RS232 RXD signal<br>Can be set as CAN0 H       | /dev/ttyAMA0 |
| Pin 3                                 | RS232_0_TXD | CPU UART0, RS232 TXD signal<br>Can be set as CAN0 L       |              |
| Pin 4                                 | RS232_2_RXD | CPU UART2, RS232 RXD signal<br>Can be set as RS485_2+(A)  | /dev/ttyAMA1 |
| Pin 5                                 | RS232_2_TXD | CPU UART2, RS232 TXD signal<br>Can be set as RS485_2-(B)  |              |
| Pin 6                                 | RS485_3+    | CPU UART3, RS485 +(A) signal<br>Can be set as GPIO Output | /dev/ttyAMA2 |
| Pin 7                                 | RS485_3-    | CPU UART3, RS485 -(B) signal<br>Can be set as GPIO Output |              |
| Pin 8                                 | Relay NO    | Relay Normally Open                                       |              |

| RS232 / RS485 / Relay Pin Definition: |           |  |  |
|---------------------------------------|-----------|--|--|
| Pin 9                                 | Relay COM | Relay Common<br>Can be set as CAN0 H             |  |
| Pin 10                                | Relay NC  | Relay Normally Connected<br>Can be set as CAN0 L |  |

Table 403 RS232/RS485/Relay Connector

 **Attention**

1. The RS232\_2 can be set as the RS485 signal (1 x RS232 + 2 x RS485 + 1 x Relay). If you need it to work as RS485, please **Contact us** before shipping.
2. The RS232\_0 can be set as the CAN signal (1 x RS232 + 1 x RS485 + 1 x CAN + 1 x Relay). If you need it to work as CAN, please **Contact us** before shipping.
3. The Relay can be set as the CAN signal (2 x RS232 + 1 x RS485 + 1 x CAN + 0 x Relay). If you need it to work as CAN, please **Contact us** before shipping.
4. The RS485\_3 can be set as Two 5V logic GPIO Output, these two GPIO can be used as Wiegand signal. If you need them to work as GPIO, please **Contact us** before shipping.
5. RS485\_3 automatically controls input/output direction. It does not need software control.
6. The 120Ω match resistor for the RS485 is **not mounted** by default.
7. The Relay Max switching voltage is 125VAC or 60VDC. The maximum switching current is 1A. Rated load is 0.3A at 125VAC and 1A at 30VDC.

## USB HOST and Type C

There are 2 x 3.0 **USB Type-A HOST connectors** and 1 x **Type-C connector** onboard, as shown in the image below.



*USB3.0 HOST and Type-C Connectors*

### Note

- External USB peripherals like a USB disk or USB mouse or keyboard can connect to the USB3.0 HOST.
- You can download software to the Raspberry Pi CM5 eMMC using the Type-C.
- When you connect the Type-C to a device, it will disable 4G module.

## M.2 Connector

The product has an **optional** M.2 2230/2242 M-key, PCIe Gen 2.0 x 1(5Gbps) (PCIe Gen 3.0 x1 is compatible but experimental) connector. You can attach an M.2 NVME drive, or an AI module to expand the product's capability. If you need the M.2 slot please contact us before placing an order.

## LAN Connectors

**LAN (RJ45) connector** provides Ethernet connectivity over standardized Ethernet cables as shown the figure below. The integrated Ethernet interface supports up to 1 Gbps data throughput. The Giga LAN signal comes from the CM5 module directly.



*RJ45 LAN Connectors*

### Note

Use CAT5 or better cables to achieve full data throughput over maximum distance defined by the 1000BASE-T standard (100m).

## 3G/4G/LTE/GPS Module

The AIO-CM5-101 all in one Raspberry Pi PC is equipped with a **mini-PCIe connector** that can connect a 3G/4G/LTE module.

4G/LTE module is **optional**. If you place an order with 4G module included, we will also add a SIM card holder and a 3G/4G/LTE antenna to ensure 3G/4G/LTE works on the AIO-CM5-101.

SIM card does **NOT** support hot plug. **Power off** before inserting or removing SIM card.

The CAT-1 module doesn't support GPS.

The CAT-4 Quectel EC25 module also supports GPS. If you need GPS/GNSS feature please contact us before placing an order.



*SIM Card Direction*

### ⚠ Attention

The product does not come shipped with the 3G/4G/LTE module by default. If you need to use 3G/4G/LTE, you can contact us when placing an order, we can install the necessary hardware for you.

USB-C shares signal with 4G/LTE module, please unplug the USB-C cable while using 4G/LTE module. If you have the USB-C occupied, the 4G/LTE module will be disabled by default.

## TF Card Slot

The AIO-CM5-101 all in one Raspberry Pi PC features 1 x **TF Card (micro SD) slot** that can only be used with CM5 Lite modules, as shown in the image below (note the direction of the TF card).



*TF Card Slot*

### **⚠ Warning**

The TF card is **only** for booting operating system for the CM5 Lite. The TF card **cannot** be used for expanding storage for CM5.

The product does not come shipped with the TF Card by default.

## Audio Out Connector

The product features 3.5mm audio connector as shown in the image below.



*Audio Out Connector*

## Internal Speaker

The product also has an internal 2W speaker, meaning you can play music without an earphone, the sound can be played from the product directly.

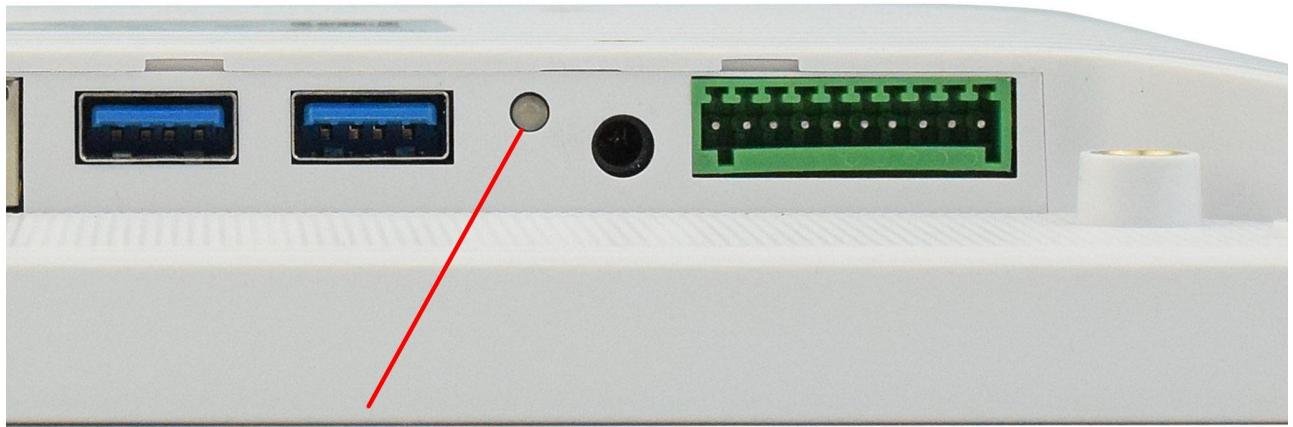
## Buzzer

The product has an internal buzzer, suitable for playing beep sounds for alarms.

# Buttons and Status LED

## Status LED

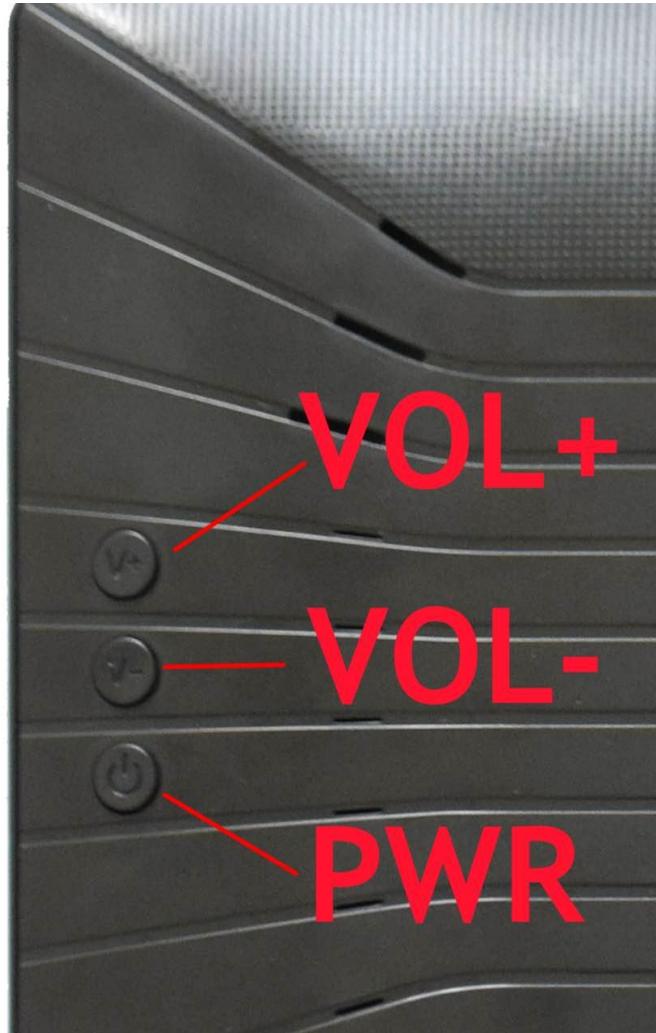
This product has a status LED. The LED turns RED after power on, turns GREEN when the system is booted. It can be controlled by software to flash YELLOW when the CPU is working.



*Status LED*

## Buttons

There are 3 buttons on the back side: Volume+, Volume- and PWR. as the image below shows.



*Buttons*

What every button does:

### **Vol+**

Volume up and boot mode button.

1. Before powering on, press and hold the Vol+ button, then apply power: the product will boot from USB-C port for flashing OS image.
2. After powering on, adjust volume up. Turn on the screen (if screen is turned off to save power).

## Vol-

Volume down button.

1. After powering on, adjust volume down. Turn on the screen (if screen is turned off to save power).

## PWR

Power button.

1. Before powering on: press to power on the PC (if set to manual boot).
2. After powering on: hold 5 seconds to force power off.

### Note

#### **How to swap the Auto Boot and Manual Boot mode?**

By default the product boots automatically when apply power to it.

*To change from auto boot to manual boot:*

Press and hold **Vol+**, **Vol-** buttons, apply power, hold for 3 seconds, release. Then the product will be changed to manual boot mode.

*To change from manual boot to auto boot:*

Press and hold **Vol+**, **Vol-** buttons, apply power, tap PWR once to power on, hold Vol+, Vol- for 3 seconds, release. Then the product will be changed to auto boot mode.

# Mounting Procedure

You can mount AIO-CM5-101 with the Vesa (75 x 75mm) and Stand mounting methods, as shown in the figures below.



*VESA mounting*

The product also ships with a base stand, if you don't need the stand you can contact us when placing orders.

(The keyboard and mouse are **NOT** included in the product.)



*Stand mounting*

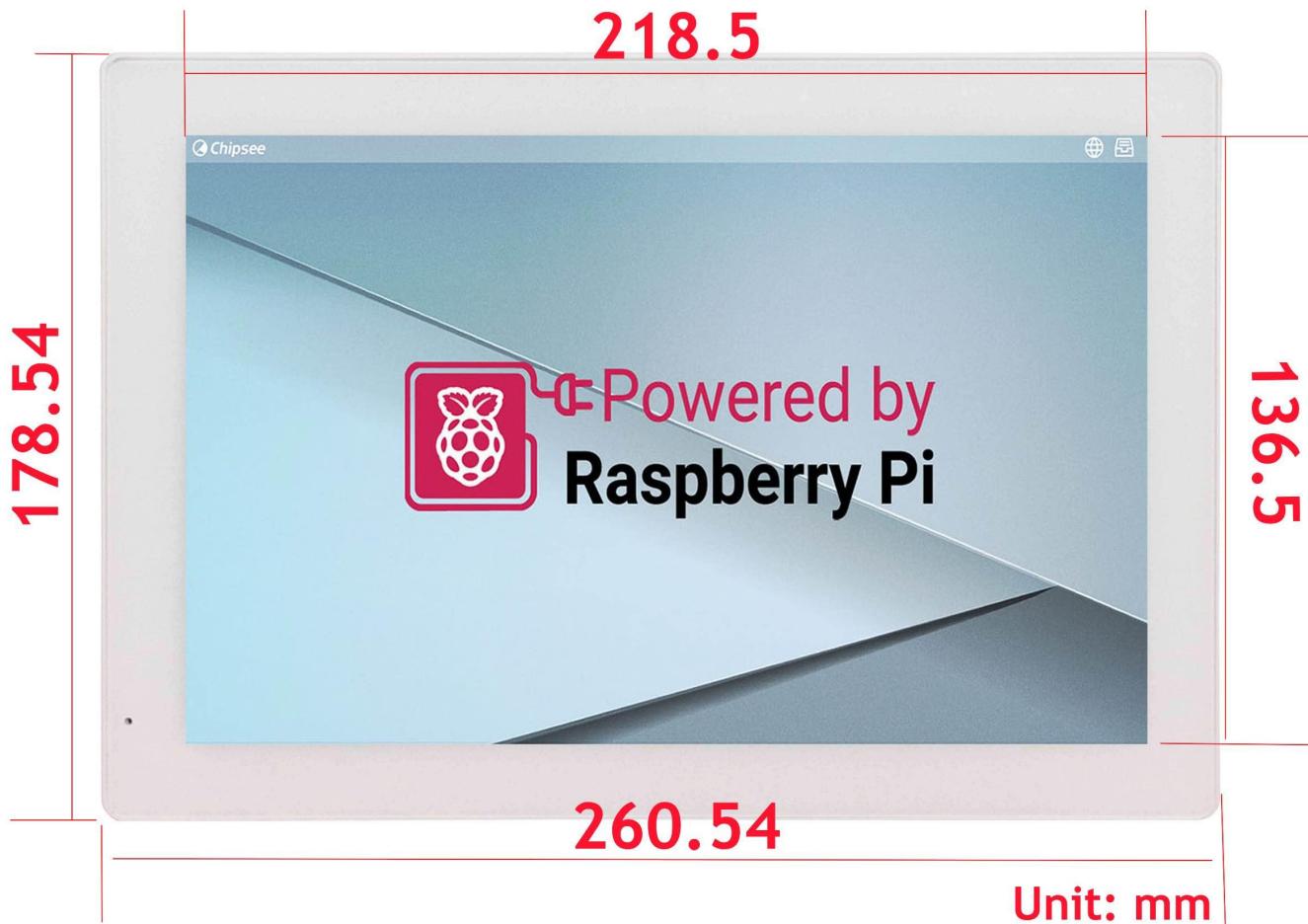
**⚠ Attention**

Please make sure the display is not exposed to high pressure when mounting into an enclosure.

You can find detailed information about mounting in the [Mount IPC Guide](#).

## Mechanical Specifications

The outer mechanical dimensions of AIO-CM5-101 are 260.54 x 178.54 x 26.9mm (W x L x H). Please refer to the technical drawing in the figures below for details related to the specific product measurements.



*Front Panel Dimension Technical Drawing*



*Side Dimension Technical Drawing*

## 3D Model

AIO-CM5-101 3D model can be viewed in the online doc in a web browser, **if you are reading from the PDF version, please visit the online doc AIO-CM5-101, select hardware documentation, drag the navigation bar to the 3D Model section.**

## Disclaimer

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