Chipsee

Industrial PC

# PPC-A72-150-C

PN: CS10768R150

**Revision 1.1**

**www.chipsee.com**

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# PPC-A72-150-C

Front View

Rear View

Side View 1

Side View 2

## Product Overview

The Cortex®-A72/53 series PPC-A72-150-C (PN: CS10768R150) is a high-quality industrial panel PC. It features a 15” ten-point capacitive touch screen with a resolution of 1024 x 768 pixels and brightness of 350 cd/$m^2$.

Key Applications

- Human Machine Interface  HMI
- Mobile Applications
- Video Processing

- Machine Learning
- Video Gaming
- Process Control
- Process Monitoring
- ATM...

It is available both as an embedded solution and as a device hosed in an aluminum casing with bezels, thus facilitating different installation options:

- Installation on an industrial cabinet
- Integration with the existing equipment

The PPC-A72-150-C Industrial Panel PC is based around the powerful CS-SOM-RK3399 System on Module (SoM), powered by the Rockchip RK3399 low-power processor which integrates a dual-core Cortex®-A72 and a quad-core Cortex®-A53 with a separate NEON coprocessor.

The RK3399 supports multi-format video decoders and has a high-performance dual-channel external memory interface (DDR3/DDR3L/LPDDR3/LPDDR4) capable of sustaining demanding memory bandwidths. It also provides a complete set of peripheral interfaces.

# 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 The PPC-A72-150-C Industrial Panel PC from the official **Chipsee Store** or from your nearest distributor.

## Operating System

This product comes with a pre-installed OS of your choice. Please see the list below for the supported OSes, which can be also obtained from the Software Documentation section, along with the detailed installation instructions.

- Chipsee Linux*
- Android 7.1
- Debian 10

* Chipsee Linux is based on buildroot that has been integrated with:

    1. Chipsee Hardware Test Application
    2. An initialization script for GPIO/Buzzer/Audio
    3. Multiple libraries, such as the `libQt5Sql` to develop Qt application with SQL
    4. Various packages, such as the `ntfs-3g` to use NTFS file system

> **Warning**
>
> The Software Documentation section provides a detailed instruction on how to install different OSes on your own. However, bear in mind that Chipsee can't take the responsibility of inadequate installation procedure. If you "brick" your device, please contact Chipsee Technical Support at **support@chipsee.com** for further assistance

## Optional Features

The PPC-A72-150-C Industrial Panel PC does not include 4G/LTE module by default. The module is optional and can be selected at the Chipsee store during the ordering process.

> **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 PPC-A72-150-C Industrial Panel PC offers a broad range of performance and connectivity options for scalable integration, providing expandability to meet future needs. Some of the key features are listed in the table below.

| PPC-A72-150-C | |
|---|---|
| **CPU** | Rokchip RK3399, Dual-core Cortex-A72 (1.8GHz), Quad-core Cortex-A53 (1.4GHz) |
| **RAM** | 4GB DDR3 |
| **eMMC** | 16GB |
| **Storage** | TF Card, Supports up to 32GB SDHC |
| **Display** | 15" LCD, 1024 x 768, High Brightness: 350 cd/$m^2$ |
| **Touch** | 10-point capacitive touch screen |
| **USB** | 4 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C |
| **LAN** | 1 x RJ45, GbE |
| **Audio** | 3.5mm Audio Out Connector, 2W Internal Speaker |
| **Buzzer** | Yes |

| PPC-A72-150-C | |
|---|---|
| **RTC** | Yes |
| **RS232** | 6 x RS2321 |
| **RS485** | 1 x RS485 (4 at most, 1 debug port)1 |
| **GPIO** | 8 Channels |
| **WiFi/BT** | Integrated WiFi/BT Module |
| **HDMI** | 1 x HDMI |
| **4G/LTE** | Supported, Optional |
| **Power Input** | From 12V to 36V |
| **Current at 15V** | 1000mA Max |
| **Power Consumption** | 15W Typical |
| **Working Temperature** | From 0°C to +70°C |
| **OS** | Android 7.1 |
| **Dimensions** | 377 x 307 x 58mm |
| **Weight** | 4100g |
| **Mounting** | VESA & Panel methods |

Table 93 Key Features

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1(1,2)This product has 7 x UART channels in total. The default configuration is 5 x RS232 and 2 x RS485. UART can be swapped between RS232 and RS485 modes easily, so if you need different RS232/RS485 configuration, please get in touch with the Chipsee Technical Support at **support@chipsee.com**

# Power Input

The PPC-A72-150-C Industrial Panel PC can be powered by a wide range of input voltages: From 12V to 36V DC. The power input connector is a **3-pin, 3.81mm terminal**. The polarity and the pinout is clearly marked on the housing of the product as shown on the figure below.

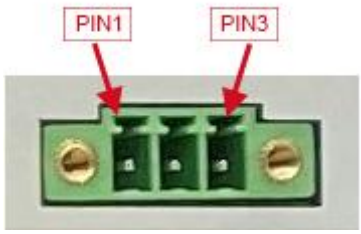


Figure 445: *Power Input*

Note that the "**+**" sign represents the positive power input, and it is printed both at the casing and as a silk-screen on a PCB of the embedded version. The "**-**" terminal is shorted to the ground.

| Power Input Definition | | |
|---|---|---|
| **Pin Number** | **Definition** | **Description** |
| Pin 1 | Positive Input | DC Power **Positive Terminal** |
| Pin 2 | Negative Input | DC Power **Negative Terminal** |
| Pin 3 | Ground | **Power System Ground** |

Table 94 Power Connector

**Note**

The system ground "**G**" is connected to power negative "**-**" on board.

# Touch Screen

The PPC-A72-150-C Industrial Panel PC uses a 10-point capacitive touch screen.

**Attention**

A capacitive touch screen is susceptible to power noise and Electromagnetic Radiation (EMR). It may cause LCD ripples or even capacitive touch malfunction. If using a capacitive multi-touch test application, you might notice the touch points float erratically across the display. There are several solutions to this problem:

1. Use a high-quality Power Adapter Unit (PSU) with low EMR. You can also provide power from a battery.
2. Make sure that the PPC-A72-150-C Power Input connector (pin 3) is properly connected to the Power System Ground to provide sufficient EMI shielding and eliminate the problem entirely.
3. Bad GND problem can also be confirmed by touching pin 3 of the Power Input connector with one hand while operating the capacitive touch screen with the other hand. In this case, the operator's body acts as the Power System Ground.

# Connectivity

There are many connectivity options available on the PPC-A72-150-C industrial PC. It has 4 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C, 1 x RJ45, GbE Ethernet connector, 6 x UART terminals (RS232/485), and 1 x DB9 connector.

## DB9 Connectors

The PPC-A72-150-C Industrial Panel PC has 1 x DB9 connector that is configured for debugging by default as shown on the figure below.

Figure 446: DB9 Connector

## RS232+RS485 Connector

The serial communication interfaces (RS485 and RS232) are routed to a **16-pin 3.81mm terminal**, as illustrated in the figure below. Serial communication on both RS485 and RS422 interfaces can reach up to 115200 kbps.

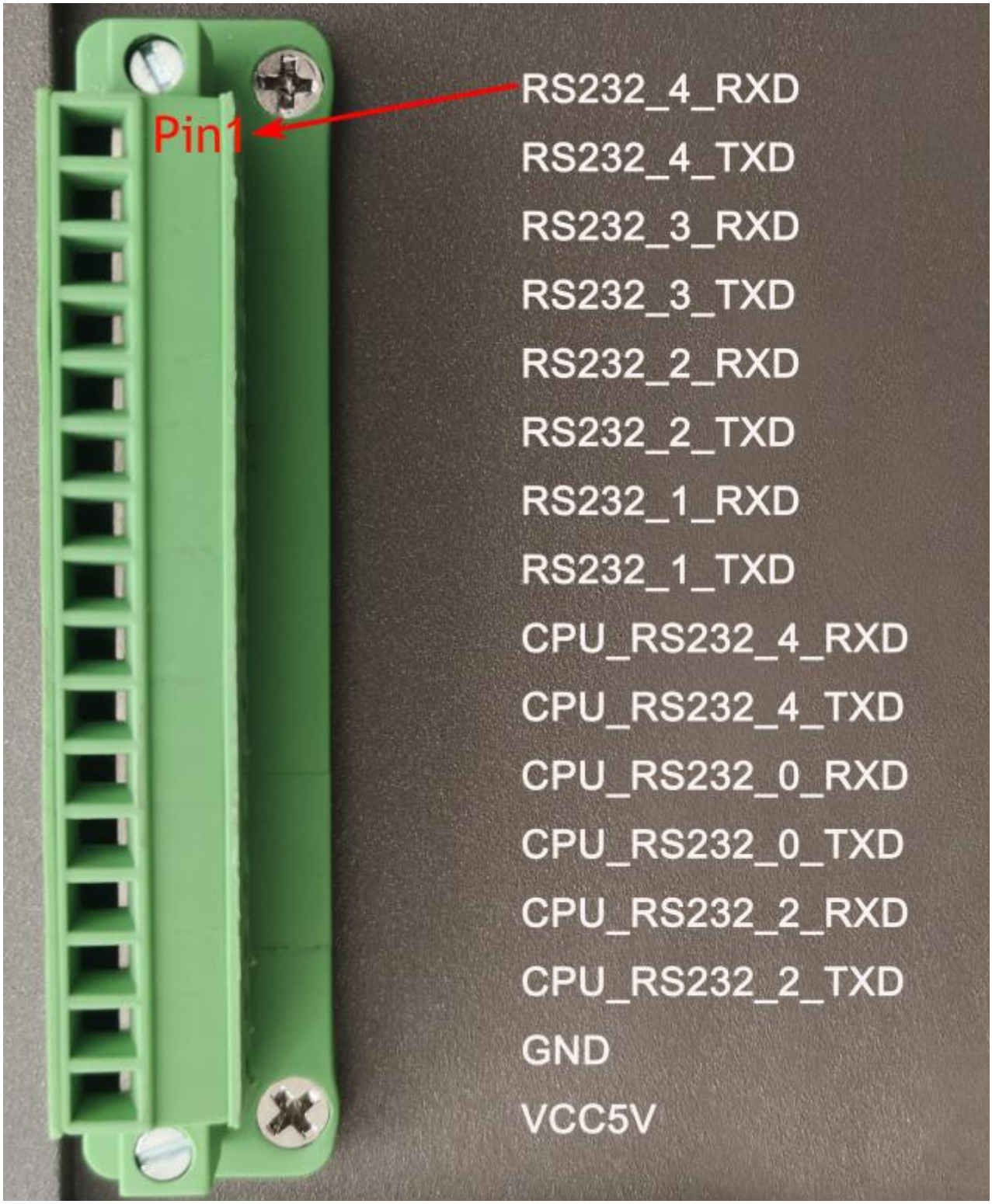


Figure 447: *Serial pins connector*

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

| **RS232 / RS485 / CAN Pin Definition:** | | |
|---|---|---|
| **Pin Number** | **Definition** | **Description** |
| Pin 1 | RS232_4_RXD | USB RS232 4 RXD signal |
| Pin 2 | RS232_4_TXD | USB RS232 4 TXD signal |
| Pin 3 | RS232_3_RXD | USB RS232 3 RXD signal |

| | | |
|---|---|---|
| Pin 4 | RS232_3_TXD | USB RS232 3 TXD signal |
| Pin 5 | RS232_2_RXD | USB RS232 2 RXD signal |
| Pin 6 | RS232_2_TXD | USB RS232 2 TXD signal |
| Pin 7 | RS232_1_RXD | USB RS232 1 RXD signal |
| Pin 8 | RS232_1_TXD | USB RS232 1 TXD signal |
| Pin 9 | CPU_RS232_4_RXD | CPU UART4, RS232 RXD signal |
| Pin 10 | CPU_RS232_4_TXD | CPU UART4, RS232 TXD signal |
| Pin 11 | CPU_RS232_0_RXD | CPU UART0, RS232 RXD signal |
| Pin 12 | CPU_RS232_0_TXD | CPU UART0, RS232 TXD signal |
| Pin 13 | CPU_RS232_2_RXD | CPU UART2, RS232 RXD signal |
| Pin 14 | CPU_RS232_2_TXD | CPU UART2, RS232 TXD signal |
| Pin 15 | GND | System Ground |
| Pin 16 | VCC5V | System +5V output, up to 1A |

Table 95 Connectivity Section

**Note**

If you need different RS232/RS485 configuration, contact the Chipsee Technical Support at **support@chipsee.com**.

## USB Connectors

There are 4 x dual **USB 2.0 HOST connectors** onboard, as shown on the figure below.

Figure 448: *USB 2.0 HOST Connectors*

There is also 1 x **USB 3.0 HOST connector** and 1 x **USB Type-C connector**, as shown below.

Figure 449: *USB 3.0 HOST Connector*

Figure 450: *USB Type-C Connector*

## 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.

Figure 451: *RJ45 LAN Connector*

**Note**

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

## WiFi & BT Module

The PPC-A72-150-C Industrial Panel PC is equipped with the popular **Realtek RTL8723 WiFi/ BT module** that supports BT/BLE 4.0 (with backward compatibility), as well as 802.11bgn 2.4 GHz Wireless LAN (WLAN).

The product includes an SMA connector for an external WiFi/BT antenna, as illustrated in the figure below.

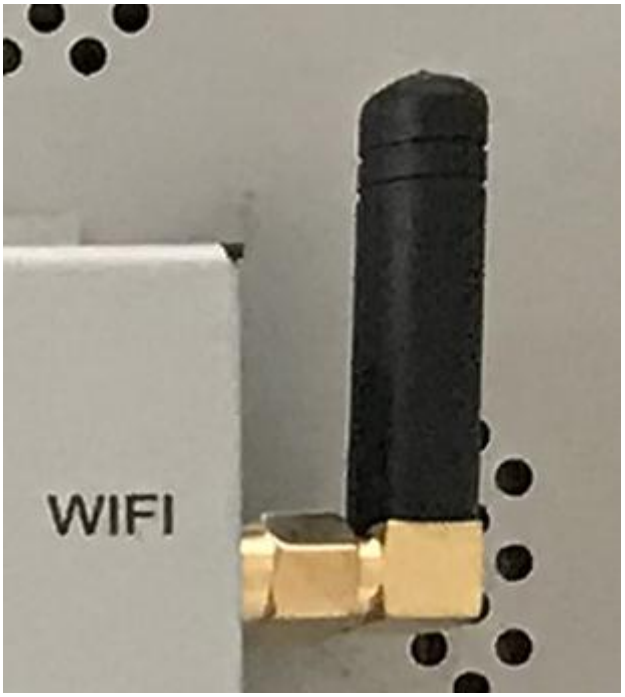


Figure 452: *WiFi+BT Antenna*

## 4G/LTE Module

The PPC-A72-150-C Industrial Panel PC is equipped with a **mini-PCIe connector** that can connect to a 4G/LTE module. The customer will also need a SIM Card Holder and a 4G/LTE Antenna Connector to ensure 4G/LTE works on the PPC-A72-150-C.

Figure 453: *SIM Card Holder*

**Attention**

The product does not come shipped with the 4G/LTE module by default.

## Expansion Connector

The PPC-A72-150-C Industrial Panel PC has 1 x **Expansion Connector** (closed by default), as shown on the figure below. This connector has connected to isolated GPIO signals.
The table below gives details about the definition of every Pin.

Figure 454: *Expansion Connector*

| Expansion Connector Pinout | | | |
|---|---|---|---|
| **PIN** | **Function** | **PIN** | **Function** |
| 1 | VDD, Isolated Power Input (+5V – +24V) | 2 | GND_ISO |
| 3 | OUT1 | 4 | OUT2 |
| 5 | OUT3 | 6 | OUT4 |
| 7 | IN1 | 8 | IN2 |
| 9 | IN3 | 10 | IN4 |

Table 96 Expansion Connector Pinout

**Warning**

Since the PCB traces of the port are connected to the processor directly, be careful not to cause electrostatic discharge or over voltage on the pins, as it may damage the processor. Take all the necessary precautions while working with electrostatic-sensitive equipment.

# TF Card Slot

The PPC-A72-150-C Industrial Panel PC features 1 x **TF Card (micro SD) slot**. It can address up to 32GB of memory.

Figure 455: *TF (micro SD) Card Slot*

**Note**

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

# Audio Connectors

The PPC-A72-150-C Industrial Panel PC features some audio peripherals, as well. It has 1 x **3.5mm audio output jack**.

Figure 456: *Audio Out Connector*

# HDMI Connector

The PPC-A72-150-C Industrial Panel PC is equipped with 1 x **HDMI connector**. The HDMI connector allows connecting an additional (external) monitor. HDMI output resolution can be configured by the software.

Figure 457: *HDMI Connector*

# Power Button

The PPC-A72-150-C Industrial Panel PC has a power button, as shown on the figure below. You can use the button to power ON or OFF the industrial PC.

Figure 458: *Power button*

# Measurements and Mounting Procedure

The outer mechanical dimensions of PPC-A72-150-C are 377 x 307 x 58mm (W x L x H). Please refer to the technical drawing in the figure below for details related to the specific product measurements.

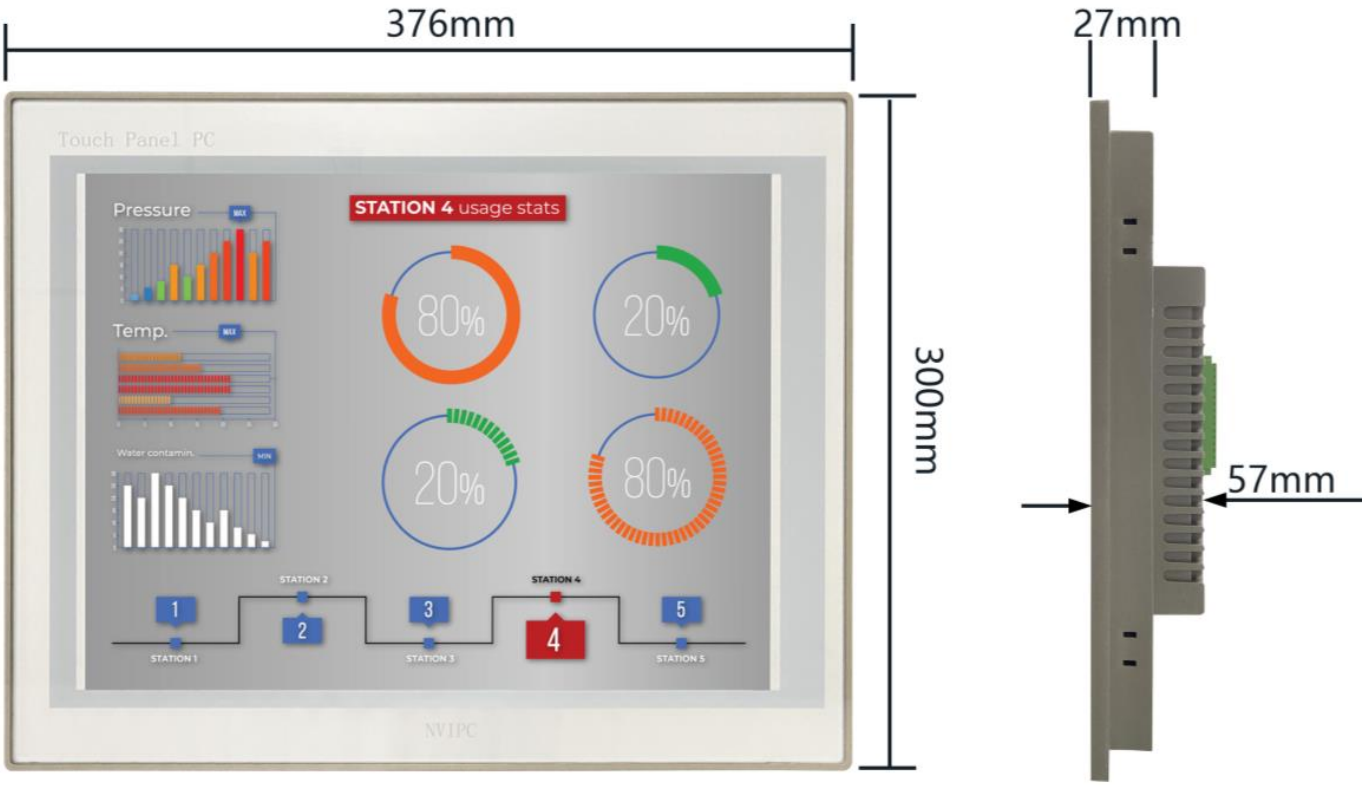


Figure 459: PPC-A72-150-C *Technical Drawing*

The PPC-A72-150-C Industrial Panel PC can be mounted with 8 x M4 screws or 4 x M4 screws using the VESA (100x100cm or 75x75cm) and Panel mounting methods, enabling simplified installation onto any standard mounting fixture.

**Panel Mounting**

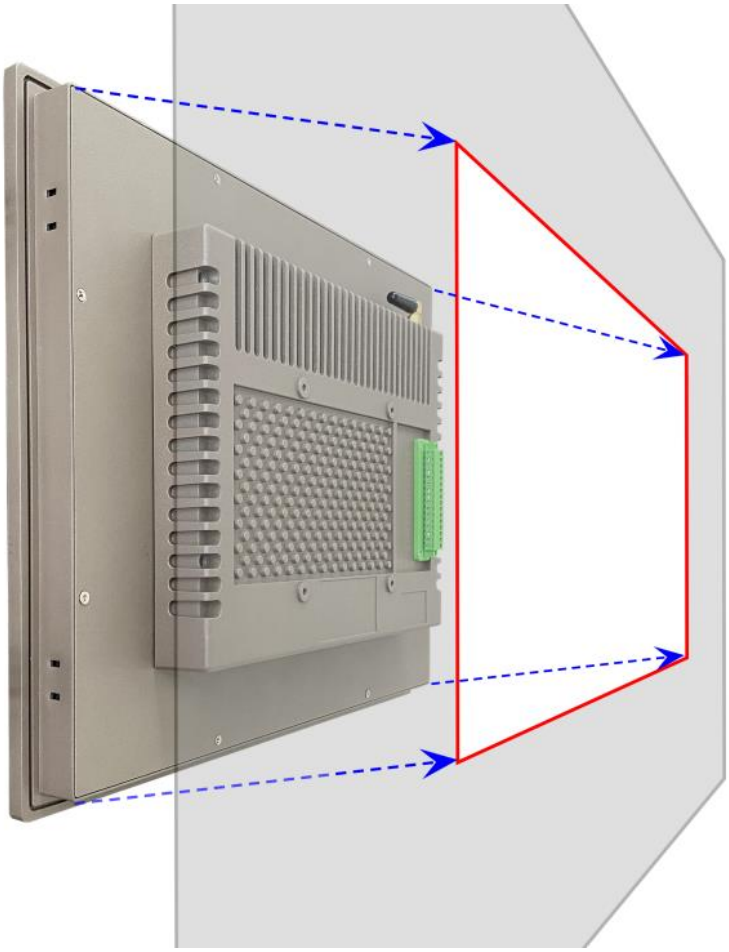

Figure 460: *Panel Mounting-1*

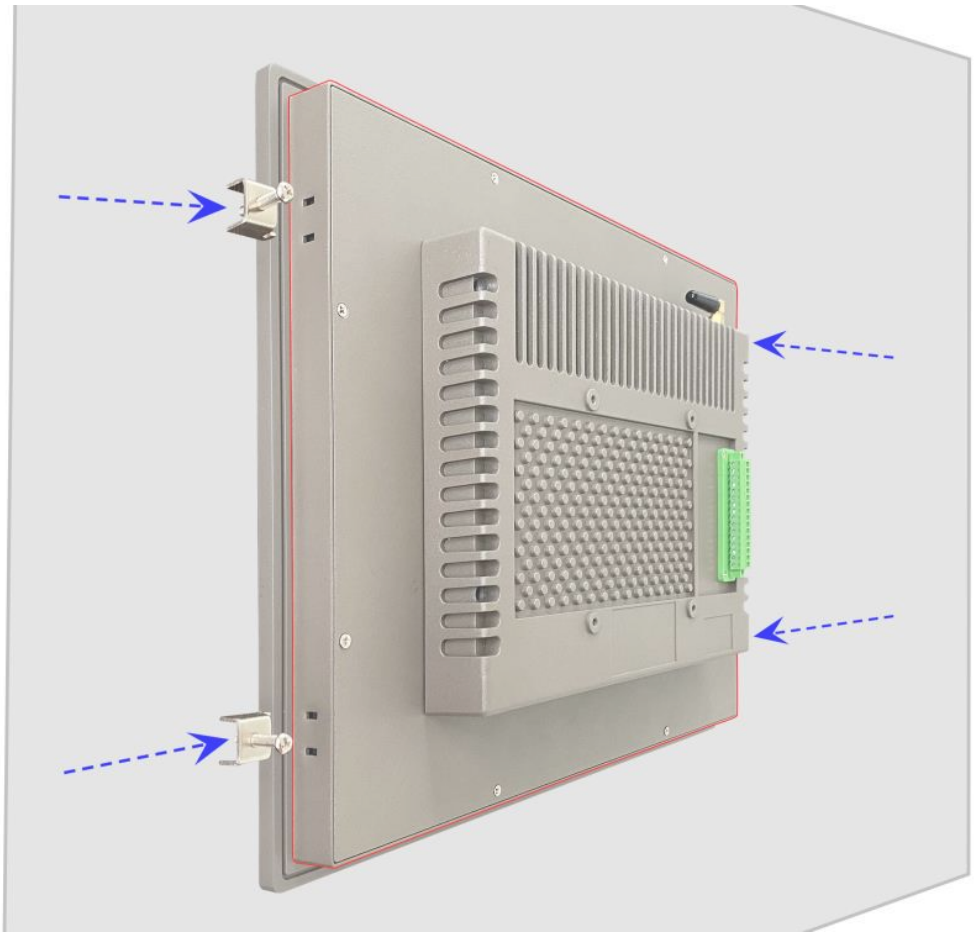

Figure 461: *Panel Mounting-2*

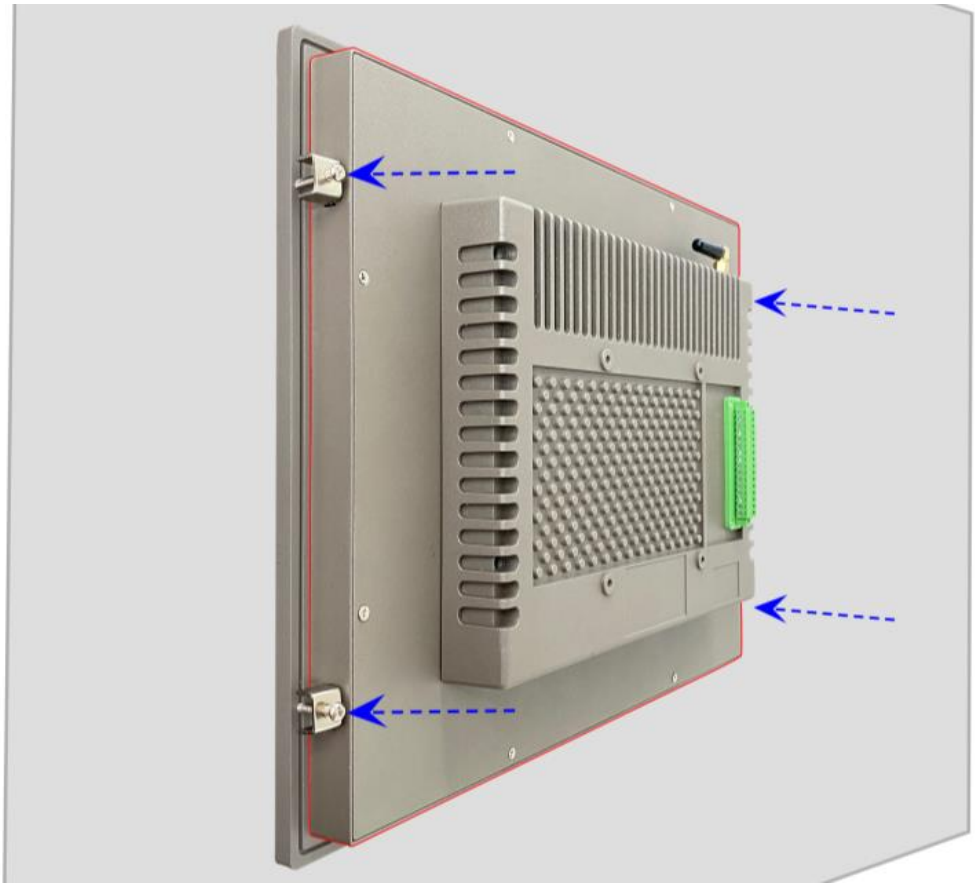

Figure 462: *Panel Mounting-3*

Figure 463: *Panel Mounting-4*

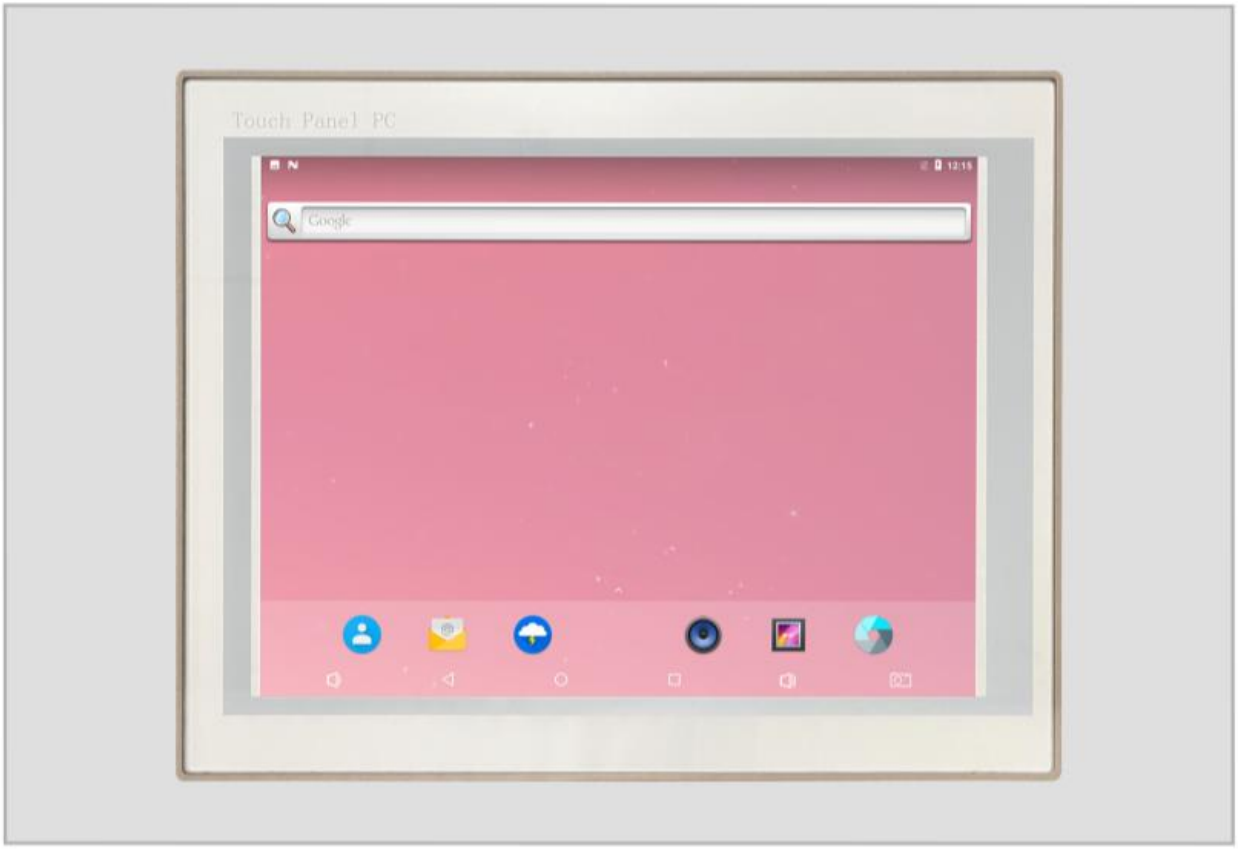


Figure 464: *Panel Mounting-5*

**Note**

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

## VESA Mounting

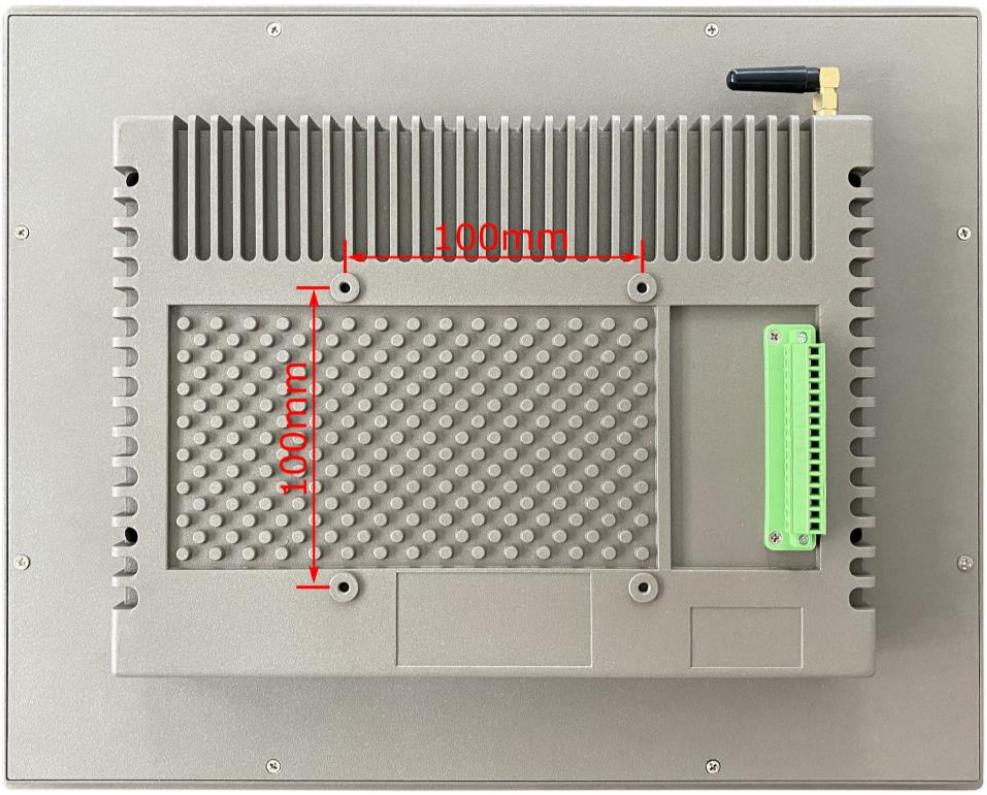

Figure 465: *VESA Mounting-1*

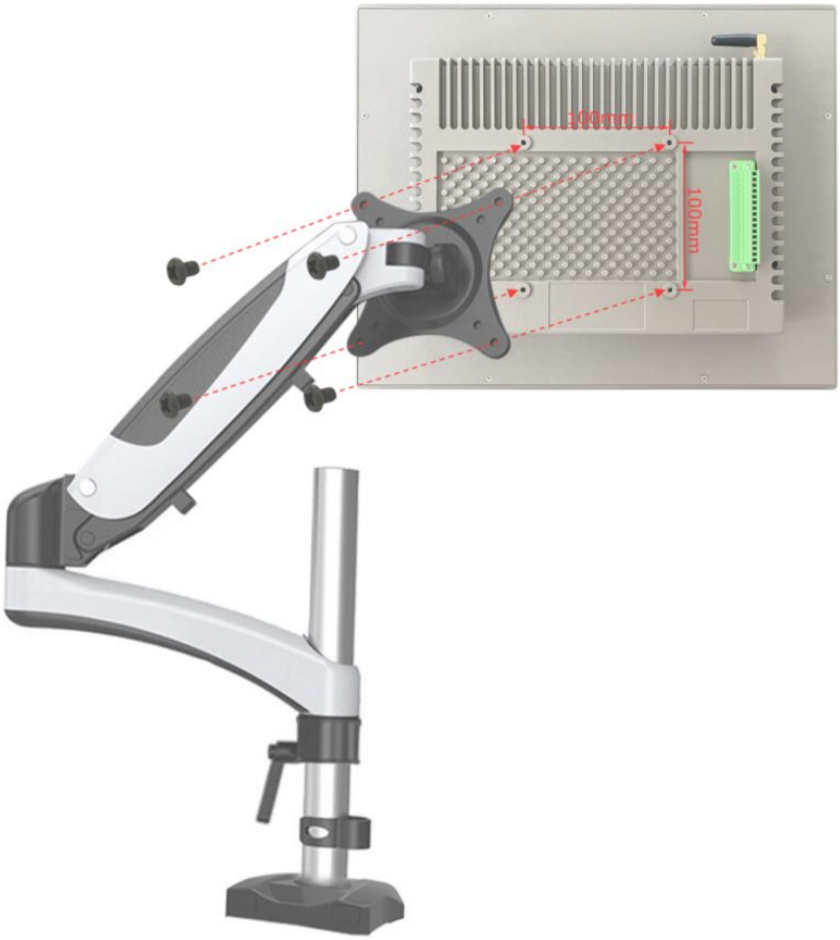


Figure 466: *VESA Mounting-2*

Figure 467: *VESA Mounting-3*

Figure 468: *VESA Mounting-4*

You can find detailed information about mounting in the Mount IPC Guide.

# Disclaimer

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