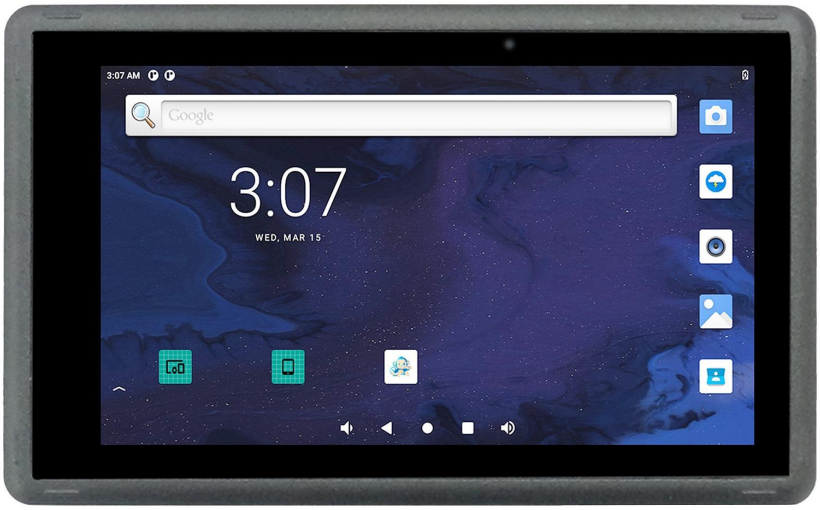
Chipsee

Industrial PC

PPC-A55-050



PN: CS12720-RK3568-050P

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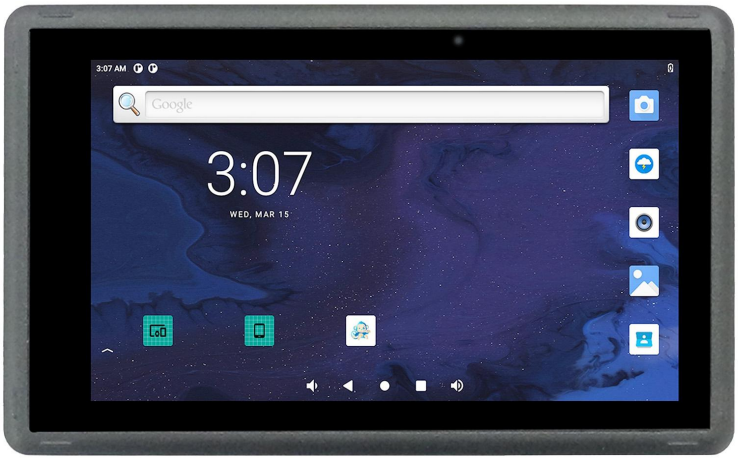
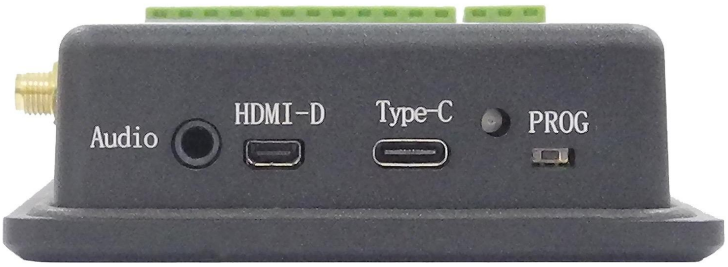
PPC-A55-050



Front View

Rear View

Side View 1



Side View 2

Product Overview

The Cortex®-A55 series PPC-A55-050 (PN: CS12720-RK3568-050P) is a high-quality IP65-compliant industrial panel PC. It features a 5” ten-point capacitive touch screen with a resolution of 1280 x 720 pixels and brightness of 400 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-A55-050 Industrial Panel PC is based around the powerful RK3568 System on Chip (SoC), powered by the Rockchip RK3568 low-power processor which integrates a quad-core Cortex®-A55 processor.

The RK3568 supports multi-format video decoders and has a high-performance RAM (LPDDR4X) 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-A55-050 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 also be obtained from the Software Documentation section, along with the detailed installation instructions.

- Debian 11
- Android 11
- Buildroot Linux Qt 5.15

> **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

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-A55-050 Industrial Panel 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.

PPC-A55-050	
CPU	Rockchip RK3568, Quad-core Cortex-A55 (2.0GHz)
RAM	2GB LPDDR4
eMMC	16GB
SSD	N/A
Storage	TF Card, Supports up to 128GB SDHC
Display	5" LCD, 1280 x 720, High Brightness: 400 cd/m^2
HDMI	1 x HDMI-D 2.0 (Micro-HDMI) Out
Touch	5-point capacitive touch screen
USB	1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C
LAN	1 x RJ45, GbE
POE	N/A
Audio	3.5mm Audio In/Out Connector, 2W Internal Speaker
Buzzer	Yes
RTC	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)*.
RS232	default 2 x RS232 (Optional 4 x RS232 at most, include 1 debug port)1
RS485	2 x RS485 at most1
CAN	default 1 x CAN (Optional 2 x CAN at most)
GPIO	N/A
WiFi/BT	Integrated WiFi/BT Module
4G/LTE	N/A

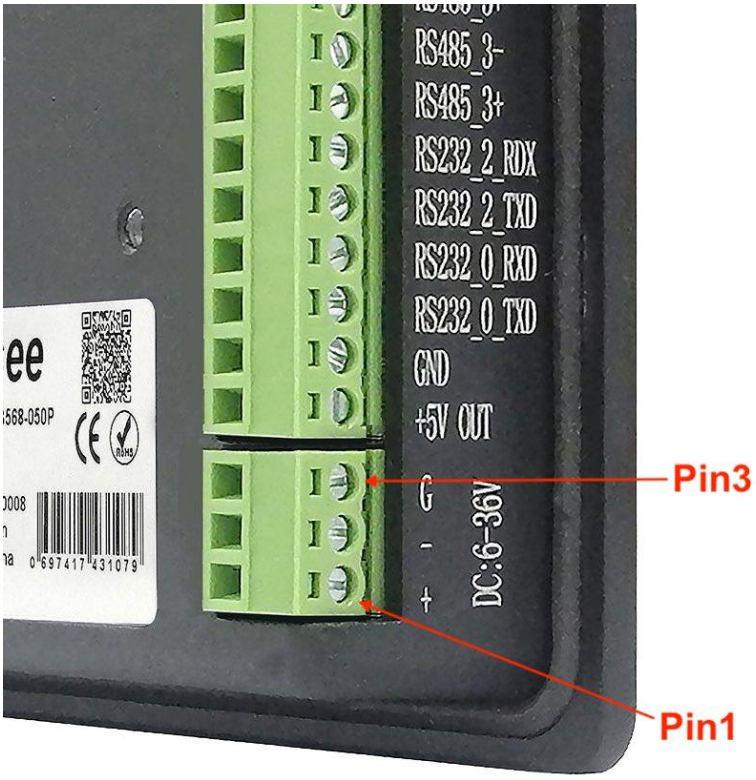
PPC-A55-050	
Power Input	From 6V to 36V
Current	450mA Max at 12V
Power Consumption	5.4W Max
Working Temperature	From 0°C to +60°C
OS	Android 11, Debian11, Buildroot Linux Qt 5.15
Dimensions	PPC-A55-050 (PN: CS12720-RK3568-050P): 138.55 x 84.70 x 27.10mm
Weight	PPC-A55-050 (PN: CS12720-RK3568-050P): 310g
Mounting	PPC-A55-050 (PN: CS12720-RK3568-050P): Panel, VESA

Table 136 Key Features

1(1,2) This product has 4 x UART channels in total. The default configuration is 2 x RS232 and 2 x RS485, including 1 debug port. UART can be swapped between RS232 and RS485 modes easily, if you need a different RS232/ RS485 configuration, please get in touch with the Chipsee Technical Support at **support@chipsee.com**

Power Input

The PPC-A55-050 Industrial Panel PC can be powered by a wide range of input voltages: From 6V 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 in the figure below.



Power Input

Note that the "**+**" sign represents the positive power input, it is printed 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 137 Power Connector

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

Touch Screen

The PPC-A55-050 Industrial Panel PC uses a 5-point capacitive touch screen.

Figure 571: *Capacitive Touch Screen Connector*

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:

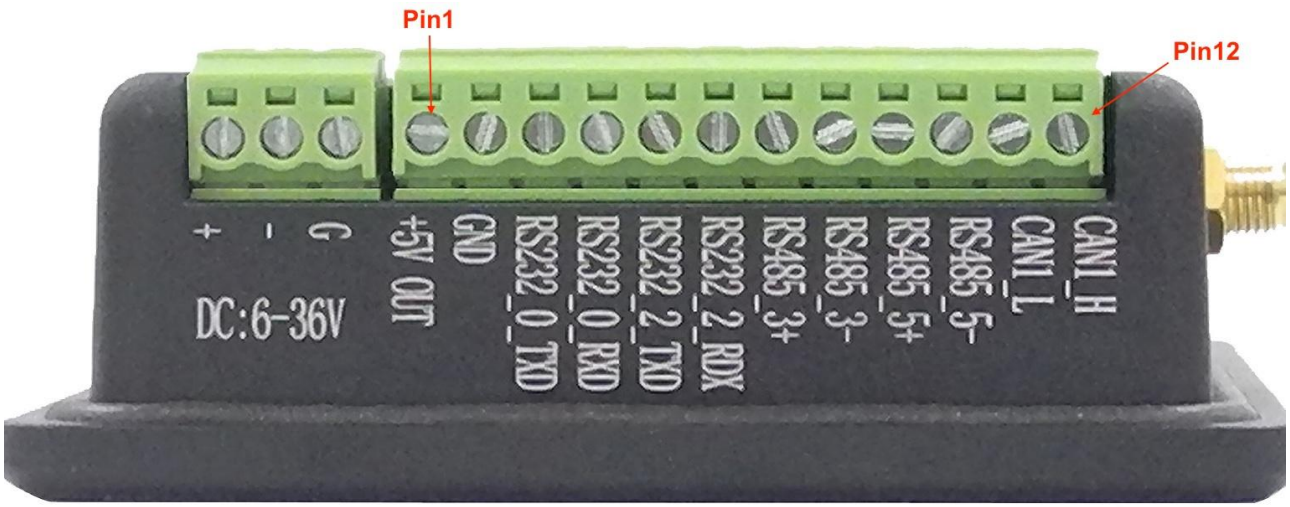
1. Use a high-quality Power Adapter Unit (PSU) with low EMR. You can also provide power from a battery.
2. Make sure that the PPC-A55-050 Power Input connector (pin 3) is properly connected to the Power System Ground to provide sufficient EMI shielding and eliminate the problem entirely.
3. Bad GND problems 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-A55-050 industrial PC. It has 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C, 1 x RJ45, GbE (RJ45) Ethernet connector supporting up to 1 Gbps, and 4 x UART terminals (RS232/RS485/CAN).

RS232/RS485/CAN

The serial communication interfaces (RS485, RS232, and CAN) are routed to a **12-pin 3.81mm terminal**, as illustrated on the figure below.



RS232-RS485-CAN

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

RS232 / RS485 / CAN Pin Definition:		
Pin Number	**Definition**	**Description**
Pin 12	CAN1_H	CAN H signal
Pin 11	CAN1_L	CAN L signal
Pin 10	RS485_4-	CPU UART4, RS485 –(B) signal
Pin 9	RS485_4+	CPU UART4, RS485 +(A) signal
Pin 8	RS485_3-	CPU UART3, RS485 –(B) signal
Pin 7	RS485_3+	CPU UART3, RS485 +(A) signal
Pin 6	RS232_0_RXD	CPU UART0, RS232 RXD signal
Pin 5	RS232_0_TXD	CPU UART0, RS232 TXD signal
Pin 4	RS232_2_RXD	CPU UART2, RS232 RXD signal, Debug Port
Pin 3	RS232_2_TXD	CPU UART2, RS232 TXD signal Debug Port
Pin 2	GND	System Ground
Pin 1	+5V	System +5V Power Output, No more than 1A Current output

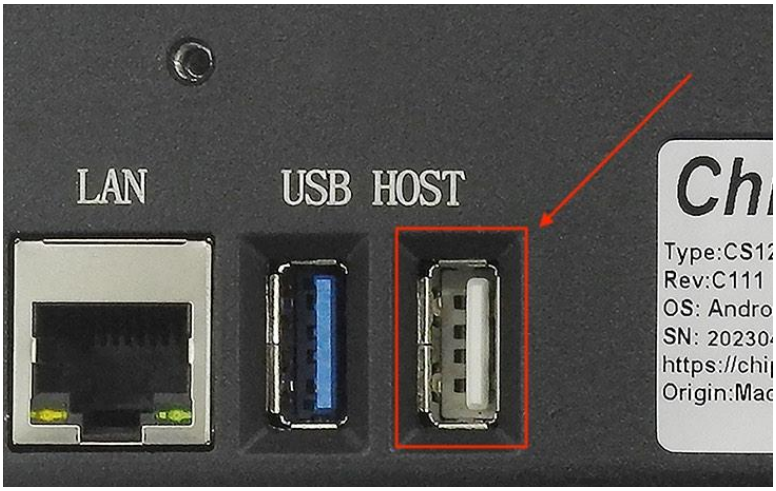
Table 138 Connectivity Section

Attention

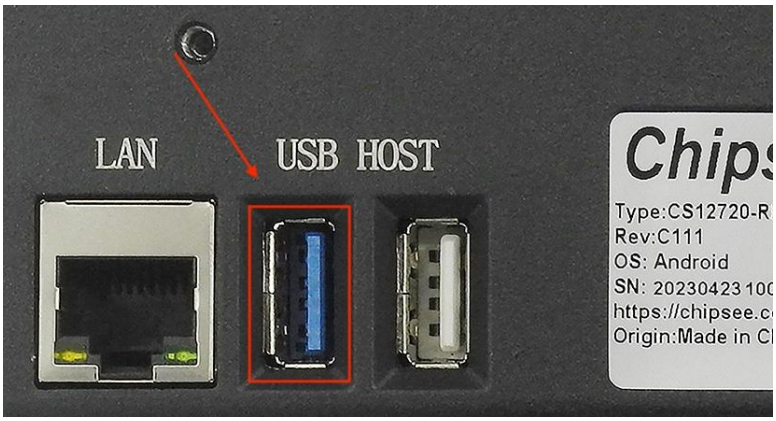
1. RS485_3 and RS485_4 can control the input and output direction automatically. There's no need to control it from within the software.
2. The 120Ω match resistor for the RS485 is mounted by default.
3. The 120Ω match resistor for the CAN bus is NOT mounted by default.

USB Connectors

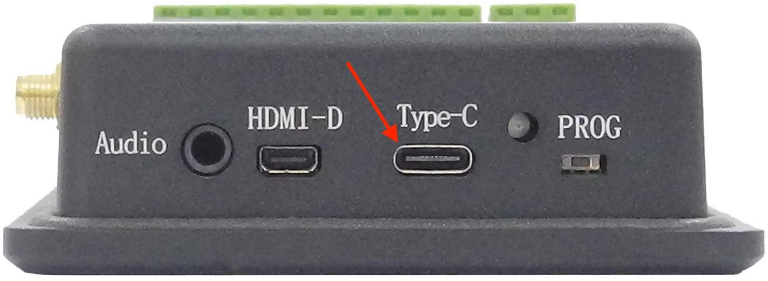
There are 2 x **USB HOST** and 1 x **USB DEVICE** (for flashing OS) ports onboard: 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C , as shown in the figures below.



USB 2.0 HOST Port (embedded / enclosed PC version)



USB 3.0 HOST Port (embedded / enclosed PC version)

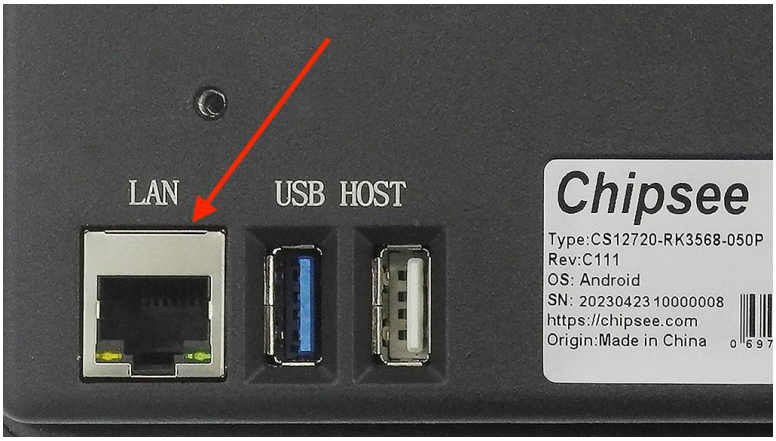


USB Type-C Port (embedded / enclosed PC version)

> **Warning**
>
> Be careful not to touch surrounding electronic components accidentally while plugging USB devices into the embedded IPC version.

LAN Connectors

LAN (RJ45) connector provides 1 x RJ45 Ethernet connectivity over standardized Ethernet cables as shown in the figure below. The integrated Ethernet interface supports up to 1 Gbps data throughput.



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-A55-050 Industrial Panel PC is equipped with the popular **Realtek RTL8821CS WiFi/BT module** which supports BT/BLE 2.1/3.0/4.2, as well as 802.11ac/abgn 433Mbps 2.4/5.8 GHz Wireless LAN (WLAN).

Figure 572: *RTL8821CS WiFi/BT Module*

The PPC-A55-050 includes an SMA connector for an external WiFi/BT antenna, as illustrated in the figure below.

WiFi+BT Antenna SMA

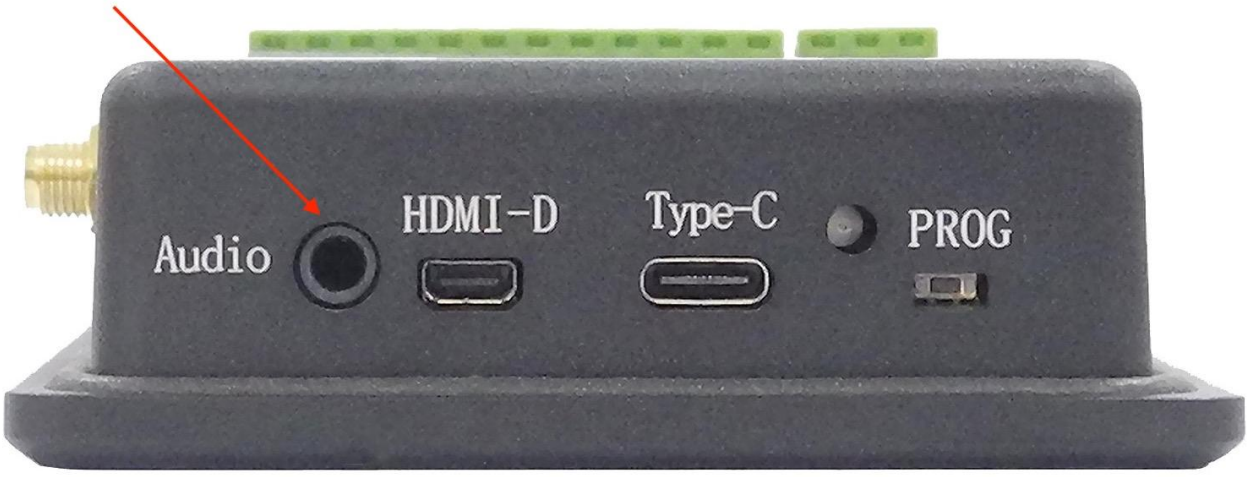
TF Card Slot

The PPC-A55-050 Industrial Panel PC features 1 x **TF Card (micro SD) slot**: SD, TF slots can address up to 128GB of memory.

TF (micro SD) Card Slot

Audio Connectors

The PPC-A55-050 Industrial Panel PC features some audio peripherals. It has a **3.5mm audio input/output jack**, an **internal speaker**, as well as a small **buzzer**.



Audio Connector (enclosed PC version)

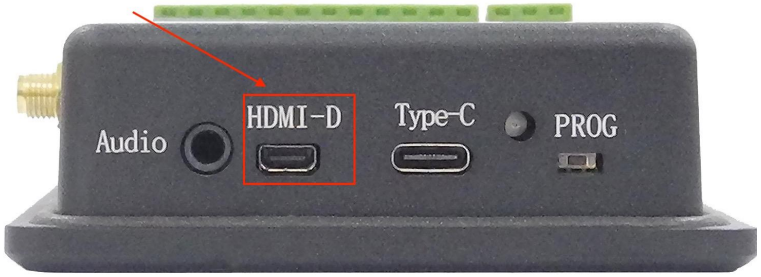
The miniature 2W embedded speaker is handy for audio reproduction, the small buzzer can play alarm/notification sounds.

Figure 573: *2W Micro Speaker and Buzzer*

> **Attention**
>
> By plugging in the headphone cable, the internal speaker will be disabled automatically.

HDMI Connector

The PPC-A55-050 Industrial Panel PC is equipped with 1 x HDMI-D 2.0 (Micro-HDMI) Out port. The HDMI connector allows connecting an additional (external) monitor. HDMI output resolution can be configured by the software.



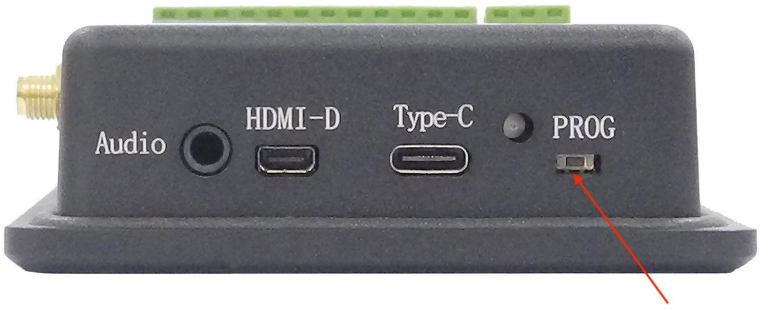
HDMI Connector

PROG Button

The PPC-A55-050 Industrial Panel PC has one button on the board marked as PROG, as shown in the figure below.
When the button is pressed before powering up, the PPC-A55-050 will enter MASKROM mode. In this mode you can use a USB Type-C cable to upgrade its operating system. You can use this feature to flash another OS to the internal eMMC.

When the button is not pressed before and during power up, the PPC-A55-050 will boot normally.

There is no need to press the button during regular operation. However, if you need to flash the OS in MASKROM mode, the button will be used. Please refer to the software documents for more information.



PROG Button

Mounting Procedure

The PPC-A55-050 Industrial Panel PC can be mounted with 2 x M4 screws, enabling simplified installation onto any standard mounting fixture.

PPC-A55-050

You can mount PPC-A55-050 with the Vesa (75 x 75mm) and Panel mounting methods, as shown on the figure below.

Figure 574: *Panel 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

PPC-A55-050

The outer mechanical dimensions of PPC-A55-050 are 138.55 x 84.70 x 27.10mm (W x L x H). Please refer to the technical drawing in the figure below for details related to the specific product measurements.

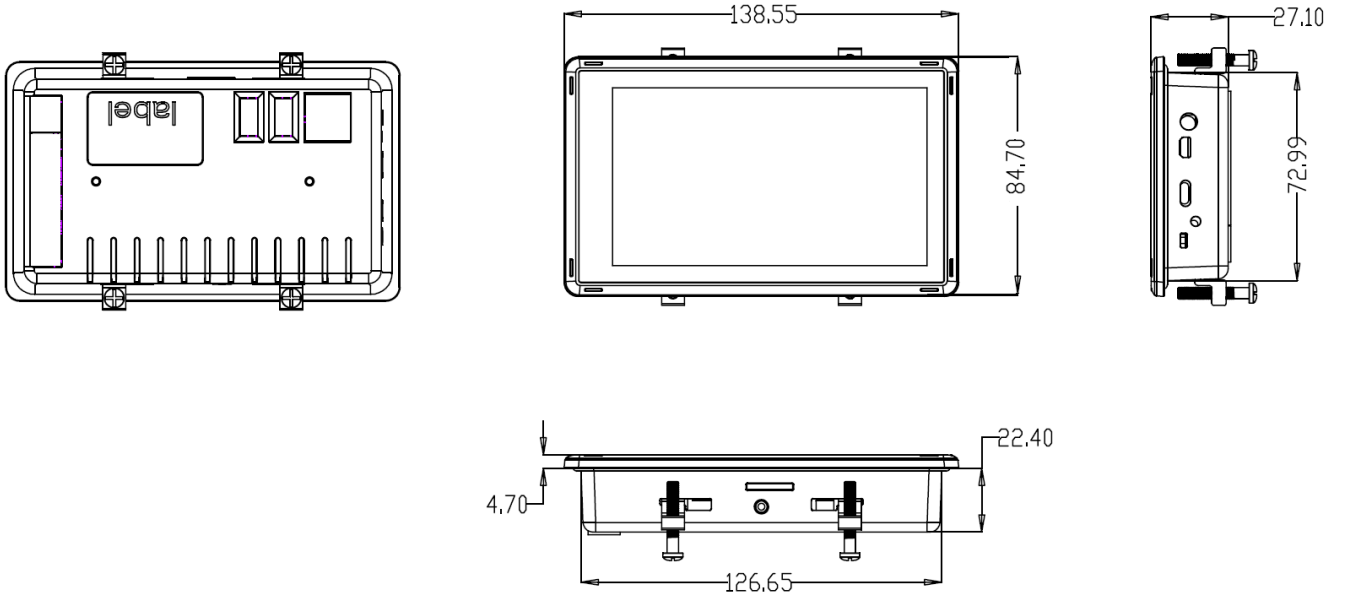


Figure 575: PPC-A55-050 *Technical Drawing*

3D Model

PPC-A55-050 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.

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