



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/m².

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 housed 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) |

| PPC-A55-050 | |
|---------------------|---|
| RAM | 2GB LPDDR4 |
| eMMC | 16GB |
| 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 |
| 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 |
| 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 <i>(optional)</i> . |
| RS232 | default 2 x RS232 (Optional 4 x RS232 at most, include 1 debug port) ¹ |
| RS485 | 2 x RS485 at most ¹ |
| CAN | default 1 x CAN (Optional 2 x CAN at most) |
| GPIO | NULL |
| WiFi/BT | Integrated WiFi/BT Module |
| 4G/LTE | NULL |
| Power Input | From 6V to 36V |
| Current at 12V | 450mA Max at 12V |
| Power Consumption | 5.4W Max |
| Working Temperature | From 0°C to +60°C |
| OS | Android 11, Debian11, Buildroot Linux Qt |
| 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 |

Table 128 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, include 1 debug port. 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-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 on the figure below.

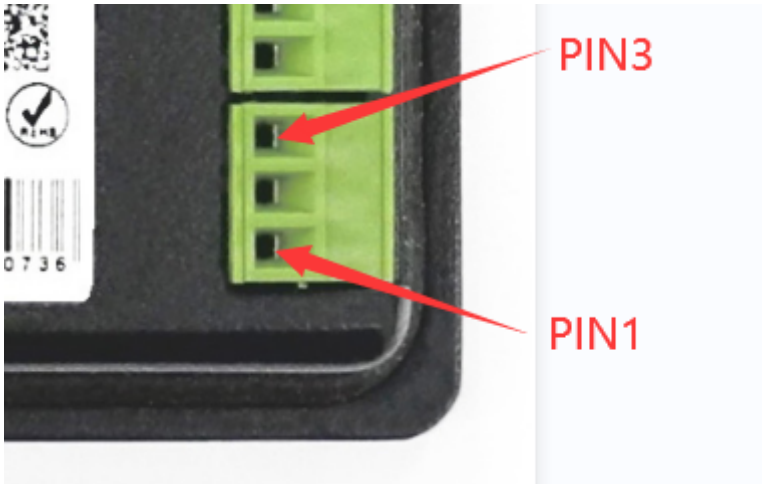


Figure 569: Power Input

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 129 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 570: *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.



Figure 571: Relation between serial pins on embedded vs. enclosed version of the PPC-A55-050 Industrial PC

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 |

| RS232 / RS485 / CAN Pin Definition: | | |
|-------------------------------------|-------------|---|
| 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 130 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 connectors** onboard which includes 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C , as shown in the figures below.



Figure 572: USB 2.0 and USB3.0 HOST Connectors (enclosed PC version)



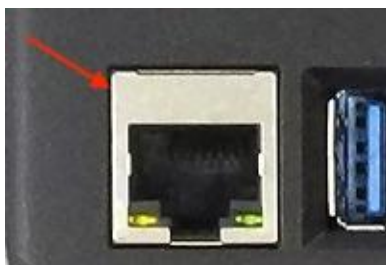
Figure 573: USB Type-C Connector (enclosed PC version)

⚠ Warning

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

LAN Connectors

LAN (RJ45) connector provides 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 574: 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.



Figure 575: TF (micro SD) Card Slot

Audio Connectors

The PPC-A55-050 Industrial Panel PC features some audio peripherals. It has 1 x **3.5mm audio output jack**.

Also, the PPC-A55-050 industrial PC has a miniature 2W internal speaker for audio reproduction, as well as a small buzzer for alarm/notification sounds.



Figure 576: Audio Connector

Attention

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

HDMI Connector

The PPC-A55-050 Industrial Panel PC supports 1 x HDMI-D 2.0 interfaces.



Figure 577: *HDMI Connector*

PROG Button

The PPC-A55-050 Industrial Panel PC has one button on the board marked as PROG, shown in the figure below.

When button is pressed before power, the PPC-A55-050 will enter MASKROM mode which can use Type-C port to upgrade system. You can use this function to download the OS software to the internal eMMC.

When button is released before power, the PPC-A55-050 will boot normally.

There is no need to press the button during regular operation. However, if you need to reinstall the OS, please refer to the detailed information on how to re-flash the OS.



Figure 578: *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 579: *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 580: 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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