



Industrial PC

# PPC-A55-070



PN: CS10600-RK3568-070P

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# PPC-A55-070

## Front View



## Rear View



# Side View 1



## Side View 2



## Product Overview

The Cortex®-A55 series PPC-A55-070 (PN: CS10600-RK3568-070P) is a high-quality IP65-compliant industrial panel PC. This single board computer features a 7" ten-point capacitive touch screen with a resolution of 1024 x 600 pixels and brightness of 500 cd/m<sup>2</sup>.

### 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-A55-070 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.



You can order the [PPC-A55-070](#) 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



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](mailto:support@chipsee.com) for further assistance

## Optional Features

The PPC-A55-070 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-A55-070 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-A55-070                |   |
|----------------------------|---|
| <b>CPU</b>                 | Rockchip RK3568, Quad-core Cortex-A55 (2.0GHz)  |
| <b>RAM</b>                 | 4GB LPDDR4  |
| <b>eMMC</b>                | 32GB  |
| <b>SSD</b>                 | N/A   |
| <b>Storage</b>             | TF Card, Supports up to 128GB SDHC  |
| <b>Display</b>             | 7" LCD, 1024 x 600, High Brightness: 500 cd/m <sup>2</sup>  |
| <b>HDMI</b>                | 1 x HDMI-D (Micro-HDMI) Out   |
| <b>Touch</b>               | 5-point capacitive touch screen   |
| <b>USB</b>                 | 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C  |
| <b>LAN</b>                 | 2 x RJ45, GbE   |
| <b>POE</b>                 | N/A   |
| <b>Audio</b>               | 3.5mm Audio In/Out Connector, 2W Internal Speaker   |
| <b>Buzzer</b>              | Yes   |
| <b>RTC</b>                 | High accuracy RTC with farad capacitor, can work 1 week after power off ( <b>default</b> ).<br>High accuracy RTC with lithium coin battery, can work 3 years after power off ( <i>optional</i> ). |
| <b>RS232</b>               | default 2 x RS232 (Optional 6 x RS232 at most, include 1 debug port, by swapping 3 x RS485 + CAN0 to 4 x RS232) <sup>1</sup>  |
| <b>RS485</b>               | default 3 x RS485 at most <sup>1</sup>  |
| <b>CAN</b>                 | default 2 x CAN FD (CAN0 can be configured to RS232)  |
| <b>GPIO</b>                | 8 Channels Isolated IO, 4 x Input and 4 x Output  |
| <b>WiFi/BT</b>             | Integrated WiFi/BT Module   |
| <b>4G/LTE</b>              | Supported, Optional   |
| <b>Power Input</b>         | From 6V to 36V  |
| <b>Current</b>             | 550mA Max at 12V  |
| <b>Power Consumption</b>   | 6.6W Max  |
| <b>Working Temperature</b> | From -10°C to +60°C   |

| PPC-A55-070       |  |
|-------------------|--|
| <b>OS</b>         | Android 11, Debian11, Buildroot Linux Qt 5.15                    |
| <b>Dimensions</b> | PPC-A55-070 (PN: CS10600-RK3568-070P): 188.05 x 123.11 x 33.20mm |
| <b>Weight</b>     | PPC-A55-070 (PN: CS10600-RK3568-070P): null                      |
| <b>Mounting</b>   | PPC-A55-070 (PN: CS10600-RK3568-070P): Panel, VESA               |

Table 188 Key Features

**1(1,2)**This product has 6 x UART channels in total. The default configuration is 2 x RS232 and 3 x RS485, include 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](mailto:support@chipsee.com)

## Power Input

The PPC-A55-070 Industrial Panel PC can be powered by a wide range of input voltages:  
From 6V to 36V DC.

There are two DC input interfaces on this device: a **3-pin, 3.81mm terminal**, and a **2.1mm I.D x 5.5mm O.D x 9.5mm DC connector**.



*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 <b>Positive Terminal</b> |
| Pin 2                  | Negative Input | DC Power <b>Negative Terminal</b> |
| Pin 3                  | Ground         | <b>Power System Ground</b>        |

Table 189 Power Connector

 Note

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

For a proper DC power connector, refer to the figure below.



## Touch Screen

The PPC-A55-070 Industrial Panel PC uses a 5-point capacitive touch screen.



Figure 606: 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-A55-070 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-A55-070 industrial PC. It has 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C, 2 x RJ45, GbE (RJ45) Ethernet connector supporting up to 1 Gbps, and 5 x UART terminals (RS232/RS485/CAN).

## RS232/RS485/CAN

The serial communication interfaces (RS485, RS232, and CAN FD) are routed to a **16-pin 3.81mm terminal**, as illustrated on the figure below.



RS232 RS485 CAN Pins

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

| RS232 / RS485 / CAN Pin Definition: |             |   |
|-------------------------------------|-------------|---|
| Pin Number                          | Definition  | Description                             |
| Pin 16                              | CAN1_H      | CAN H signal                            |
| Pin 15                              | CAN1_L      | CAN L signal                            |
| Pin 14                              | CAN0_H      | CAN H signal                            |
| Pin 13                              | CAN0_L      | CAN L signal                            |
| Pin 12                              | RS485_5-    | CPU UART5, RS485 -(B) signal            |
| Pin 11                              | RS485_5+    | CPU UART5, RS485 +(A) 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 |

| RS232 / RS485 / CAN Pin Definition: |             |   |
|-------------------------------------|-------------|---|
| 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 190 Connectivity Section

**⚠ Attention**

1. RS485\_3,RS485\_4 and RS485\_5 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 2.0 HOST Port (embedded / enclosed PC version)*

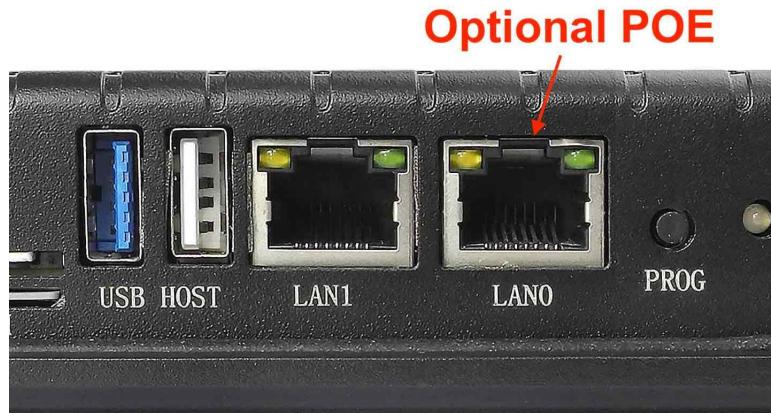


*USB Type-C Port (embedded / enclosed PC version)***⚠ Warning**

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

## LAN Connectors

**LAN (RJ45) connector** provides 2 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-A55-070 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 607: RTL8821CS WiFi/BT Module

The PPC-A55-070 includes an SMA connector for an external WiFi/BT antenna, as illustrated in the figure below.



WiFi+BT Antenna SMA

## 4G/LTE Module

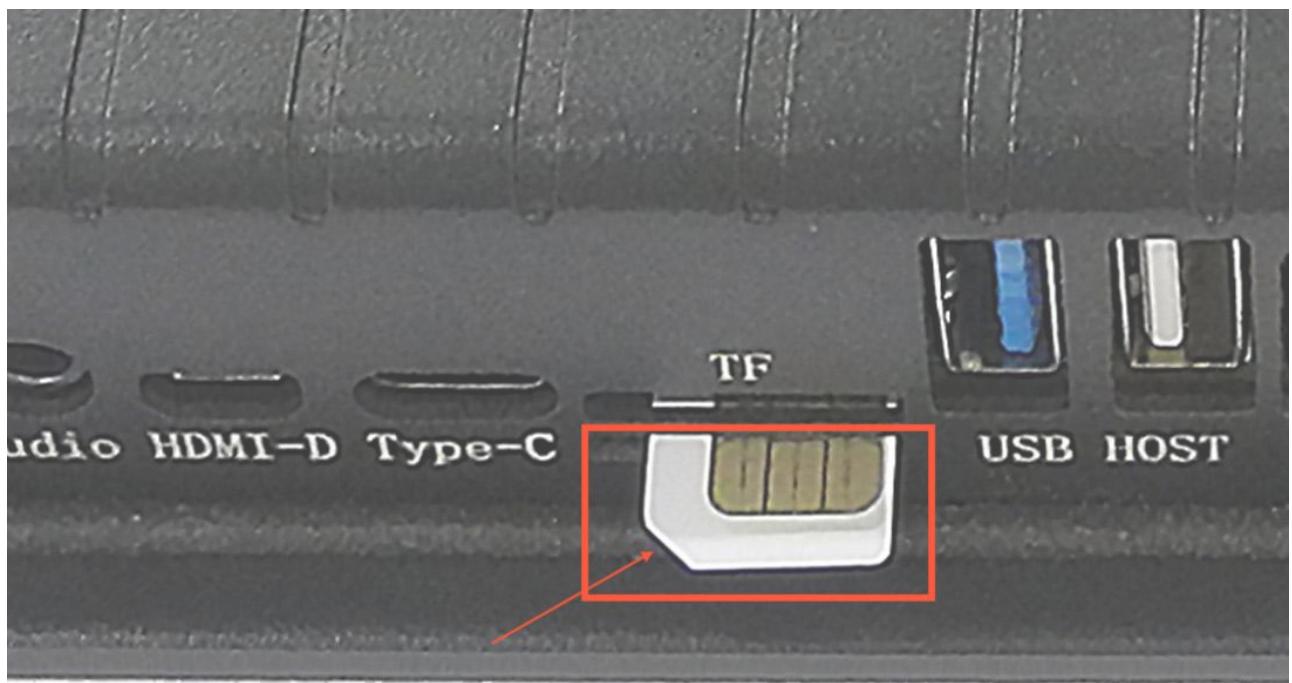
The PPC-A55-070 Industrial Panel PC is equipped with a **mini-PCIe connector** that can connect a 4G/LTE module. The customer will also need a SIM Card Holder and a 4G/LTE Antenna Connector to ensure 4G/LTE works on the PPC-A55-070. SIM card does **NOT** support hot plug. **Power off** before inserting or removing SIM card.



Figure 608: mini-PCIe Connector & 4G Module



Figure 609: SIM Card Holder & 4G Antenna



SIM Card Direction

### ⚠ Attention

The product does not come shipped with the 4G/LTE module by default. The customer can choose the 4G/LTE module option when placing an order, we will install all the necessary components.

## TF Card & SIM Card Slot

The PPC-A55-070 Industrial Panel PC features 1 x **TF Card (micro SD) slot** and 1 x **SIM Card slot**. TF Card can address up to 128GB of storage.



*TF (micro SD) Card & SIM Card Slot*

 **Note**

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

# Audio Connectors

The PPC-A55-070 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 610: 2W Micro Speaker and Buzzer

## ⚠️ Attention

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

## HDMI Connector

The PPC-A55-070 Industrial Panel PC is equipped with 1 x HDMI-D (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-A55-070 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-A55-070 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-A55-070 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*

## GPIO

The PPC-A55-070 Industrial Panel PC features a **10-pin 3.81 mm terminal** that provides 8 x opto-isolated GPIO pins, of which 4 x are output, and 4 x are input pins. The 10-pin terminal also includes an isolated PSU input in the range of 5 to 24 VDC. The exact pinout is given in follow table.

The GPIO **HIGH** output level corresponds to the voltage connected at the Isolated Power Input, while the GPIO **LOW** output level corresponds to the isolated Ground Input. Each GPIO output can drive loads up to 500mA, enough to drive various applications directly, such as relays or solenoid valves.



*GPIO Terminal (enclosed PC version)*



Isolated GPIO reduced schematic

| GPIO Pin Definition: |                       |
|----------------------|-----------------------|
| Pin Number           | Definition            |
| Pin 1                | Isolated Power Input2 |
| Pin 2                | Isolated Ground Input |
| Pin 3                | OUT1                  |
| Pin 4                | OUT2                  |
| Pin 5                | OUT3                  |
| Pin 6                | OUT4                  |
| Pin 7                | IN1                   |
| Pin 8                | IN2                   |
| Pin 9                | IN3                   |
| Pin 10               | IN4                   |

Table 191 GPIO Pinout

**2**

If the isolation is not a requirement, it is possible to use a non-isolated PSU instead.

It is also possible to use the onboard 5V power supply: it can be re-routed to the *Isolated Power Input* pin by populating R251 and R247 PCB footprints with  $0\Omega$  resistors.

Note that in this case, the *Isolated Power Input* pin will become an output for the onboard 5V power supply.

# Mounting Procedure

You can mount PPC-A55-070 with VESA mounting: **75 x 75** mm, 4 x **M4** (6mm) screws.

You can also mount PPC-A55-070 with panel mounting method.

## ⚠ 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](#).



Figure 611: *Panel mounting*

## Mechanical Specifications

For PPC-A55-070, the outer mechanical dimensions are 188.05 x 123.11 x 33.20mm (W x L x H).

Please refer to the technical drawing in the figure below for details related to the specific product measurements.



Figure 612: PPC-A55-070 Technical Drawing

## 3D Model

PPC-A55-070 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 [PPC-A55-070](#), select hardware documentation, drag the navigation bar to the 3D Model section.

## Disclaimer

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