

Industrial PC

# PPC-A72-156-P



PN: CS19108R156P2



## **Contents**

P	PC-A72-156-P	3
	1. Product Overview	7
	2. Ordering Options	8
	2.1. Operating System	8
	2.2. Optional Features	9
	3. Hardware Features	10
	4. Power Input	12
	5. Touch Screen	13
	6. Connectivity	14
	6.1. RS232+RS485+CAN+GPIO Connector	14
	6.2. USB Connectors	17
	6.3. LAN Connectors	18
	6.4. WiFi & BT Module	19
	6.5. 4G/LTE Module	20
	7. TF Card Slot	22
	8. Audio Connectors	23
	9. Power Button	24
	10. Mounting Procedure	25
	11. Mechanical Specifications	26
	12. Disclaimer	27
	13. Technical Support	27

## PPC-A72-156-P

## **Front View**



## Rear View



## Side View 1



## Side View 2



PPC-A72-156-P Product Overview

#### **Product Overview**

The Cortex<sup>®</sup>-A72/53 series PPC-A72-156-P (PN: CS19108R156P2) is a high-quality industrial panel PC. It features a 15.6" ten-point capacitive touch screen with a resolution of 1920 x 1080 pixels and brightness of  $400 \text{ cd/m}^2$ .

#### **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-A72-156-P 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<sup>®</sup>-A72 and a quad-core Cortex<sup>®</sup>-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.

PPC-A72-156-P Ordering Options

### **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 PPC-A72-156-P 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.

- Buildroot Linux Qt5.14\*
- Android 7.1
- Debian 10
- \* (Formerly Chipsee Linux) 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 <a href="ntfs-3g">ntfs-3g</a> 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 <a href="mailto:support@chipsee.com">support@chipsee.com</a> for further assistance

PPC-A72-156-P **Optional Features** 

#### **Optional Features**

The PPC-A72-156-P 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. PPC-A72-156-P Hardware Features

### **Hardware Features**

The PPC-A72-156-P 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-A72-156-P				
СРИ	Rockchip RK3399, Dual-core Cortex-A72 (1.8GHz), Quad-core Cortex-A53 (1.4GHz)			
RAM	4GB DDR3			
еММС	16GB			
Storage	TF Card, Supports up to 128GB SDHC			
Display	15.6" LCD, 1920 x 1080, High Brightness: 400 cd/m <sup>2</sup>			
Touch	10-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	Yes			
RS232	3 x RS232 (Optional 5 x RS232 at most, 1 debug port)1			
RS485	2 x RS4851			
GPIO	8 Channels			
WiFi/BT	Integrated WiFi/BT Module			
4G/LTE	Supported, Optional			
Power Input	From 12V to 36V			
Current at 15V	2.2A Max			
Power Consumption	16W Typical, 26.4W Max			
Working Temperature	From 0°C to +60°C			
OS	Android 7.1, Debian 10, Buildroot Linux Qt5.14			
Dimensions	PPC-A72-156-P (PN: CS19108R156P2): 400 × 256 × 52.5mm			
Weight	PPC-A72-156-P (PN: CS19108R156P2): 4500g			
Mounting	PPC-A72-156-P (PN: CS19108R156P2): Panel, VESA			

Table 107 Key Features

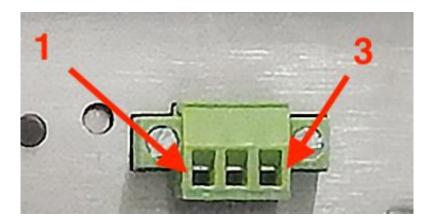
PPC-A72-156-P Hardware Features

1(1,2)
This product has 5 x UART channels in total. The default configuration is 3 x RS232 and 2 x RS485, including 1 debug port. UART can be swapped between RS232 and RS485 modes easily, so if you need a different RS232/ RS485 configuration, please get in touch with the Chipsee Technical Support at <a href="mailto:support@chipsee.com">support@chipsee.com</a>

PPC-A72-156-P Power Input

## **Power Input**

The PPC-A72-156-P 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**.



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	ower 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	Power System Ground	

Table 108 Power Connector



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

PPC-A72-156-P Touch Screen

#### **Touch Screen**

The PPC-A72-156-P Industrial Panel PC uses a 10-point capacitive touch screen.



Figure 455: 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-A72-156-P 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.

PPC-A72-156-P Connectivity

## **Connectivity**

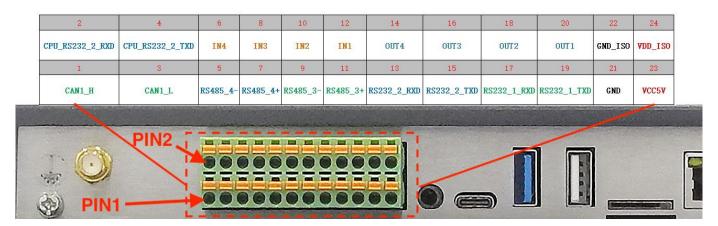
There are many connectivity options available on the PPC-A72-156-P industrial PC. It has 1 x USB 2.0 HOST, 1 x USB 3.0 HOST, 1 x USB Type-C, 1 x network connector (RJ45) supporting up to 1 Gbps, 8 x GPIO and 5 x UART terminals (RS232/485).

#### RS232+RS485+CAN+GPIO Connector

The serial communication interfaces (RS485, RS232, and CAN) are routed to a **12-pin 3.81mm terminal**, as illustrated in the figure below. Serial communication on both RS485 and RS232 interfaces can reach up to 115200 kbps.



Isolated GPIO reduced schematic



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

RS232 / RS485 / CAN / GPIO Pin Definition:				
Pin Number	Definition	Description		
Pin 1	CAN1_H	CAN H signal		
Pin 2	CPU_RS232_2_RXD	CPU UART2, CPU RS232 RXD signal		
Pin 3	CAN1_L	CAN L signal		
Pin 4	CPU_RS232_2_TXD	CPU UART2, CPU RS232 TXD signal		
Pin 5	RS485_4-	USB UART4, RS485 -(B) signal		
Pin 6	IN4	Isolated Input 4		
Pin 7	RS485_4+	USB UART4, RS485 +(A) signal		
Pin 8	IN3	Isolated Input 3		
Pin 9	RS485_3-	USB UART3, RS485 -(B) signal		
Pin 10	IN2	Isolated Input 2		
Pin 11	RS485_3+	USB UART3, RS485 +(A) signal		
Pin 12	IN1	Isolated Input 1		
Pin 13	RS232_2_RXD	USB UART2, RS232 RXD signal		
Pin 14	OUT4	Isolated Output 4		
Pin 15	RS232_2_TXD	USB UART2, RS232 TXD signal		
Pin 16	OUT3	Isolated Output 3		
Pin 17	RS232_1_RXD	USB UART1, RS232 RXD signal		
Pin 18	OUT2	Isolated Output 2		
Pin 19	RS232_1_TXD	USB UART1, RS232 TXD signal		
Pin 20	OUT1	Isolated Output 1		
Pin 21	GND	System Ground		
Pin 22	GND_ISO	Isolated Ground		
Pin 23	VCC5V	System 5V output, up to 1A		

RS232 / RS485 / CAN / GPIO Pin Definition:			
Pin 24	VDD_ISO	Isolated Power Input,support 5V~24V	

Table 109 Connectivity Section



#### Attention

- The  $120\Omega$  match resistor for CAN bus is NOT mounted by default.
- The  $120\Omega$  match resistor for **RS485** is **already mounted** by default.
- This product supports changing 2 x RS485 to 2 x RS232 and supports up to 5 x RS232 (include one debug port).
- The GPIO has been opt-isolated, you can use an external isolated power input but the power input range should be from 5V to 24V DC.
- The 4 output channels can drive at most 500mA current on each channel.

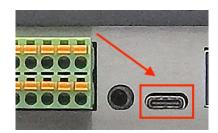
PPC-A72-156-P USB Connectors

#### **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.



USB 2.0 and USB 3.0 HOST Connectors (enclosed PC version)



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.

PPC-A72-156-P LAN Connectors

#### **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



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

PPC-A72-156-P WiFi & BT Module

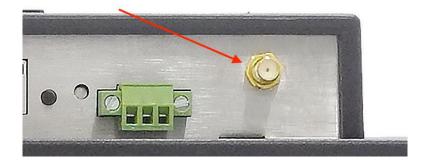
#### WiFi & BT Module

The PPC-A72-156-P 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).



Figure 456: RTL8273 WiFi/BT Module

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



WiFi+BT Antenna SMA

PPC-A72-156-P 4G/LTE Module

#### **4G/LTE Module**

The PPC-A72-156-P Industrial Panel PC is equipped with a **mini-PCle 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-A72-156-P. SIM card does NOT support hot plug. Power off before inserting or removing SIM card.

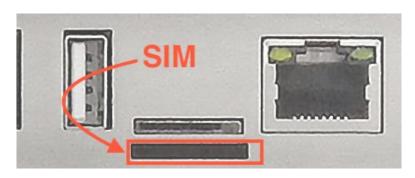


Figure 457: mini-PCIe Connector & 4G Module





Figure 458: SIM Card Holder & 4G Antenna



SIM Card Holder

PPC-A72-156-P 4G/LTE Module



SIM Card Direction



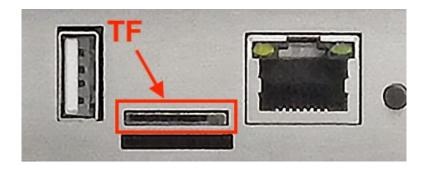
#### Attention

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

PPC-A72-156-P TF Card Slot

### **TF Card Slot**

The PPC-A72-156-P Industrial Panel PC features 1 x **TF Card (micro SD) slot**. It can address up to 128GB of memory.



TF (micro SD) Card Slot



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

PPC-A72-156-P Audio Connectors

### **Audio Connectors**

The PPC-A72-156-P 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)



#### Attention

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

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





Figure 459: 2W Micro Speaker and Buzzer

PPC-A72-156-P Power Button

### **Power Button**

The PPC-A72-156-P 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.



Power Button

PPC-A72-156-P Mounting Procedure

## **Mounting Procedure**

The PPC-A72-156-P Industrial Panel PC can be mounted with  $4 \times M4$  (6mm) screws using the **VESA** (100x100mm or 75x75mm).

The PPC-A72-156-P Industrial Panel PC can be mounted with **panel mounting** method, enabling simplified installation onto any standard mounting fixture.



#### Attention

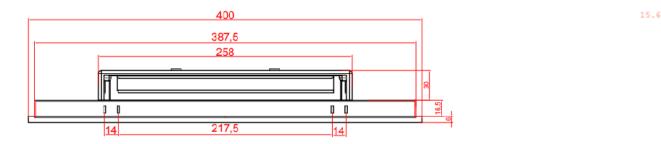
Please make sure the display is not exposed to high pressure when mounting into an enclosure.

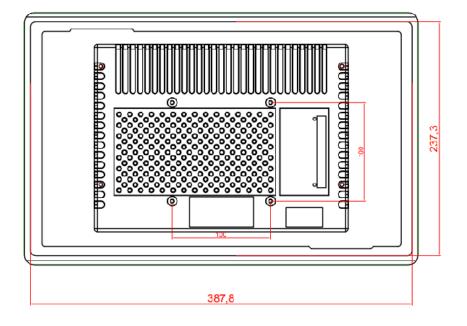
You can find detailed information about mounting in the Mount IPC Guide.

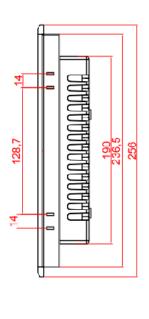
PPC-A72-156-P Mechanical Specifications

## **Mechanical Specifications**

For PPC-A72-156-P, the outer mechanical dimensions are  $400 \times 256 \times 52.5$ mm (W x L x H).







PPC-A72-156-P Disclaimer

### **Disclaimer**

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