

Industrial PC

PPC-A9-190-C



PN: CS14900F190

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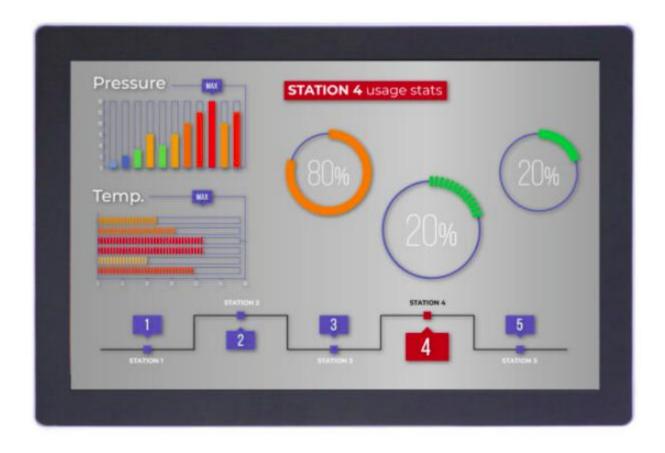
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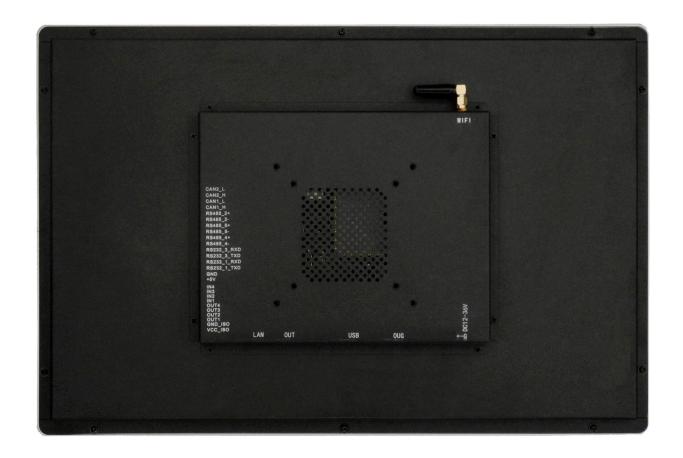
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PPC-A9-190-C

Front View



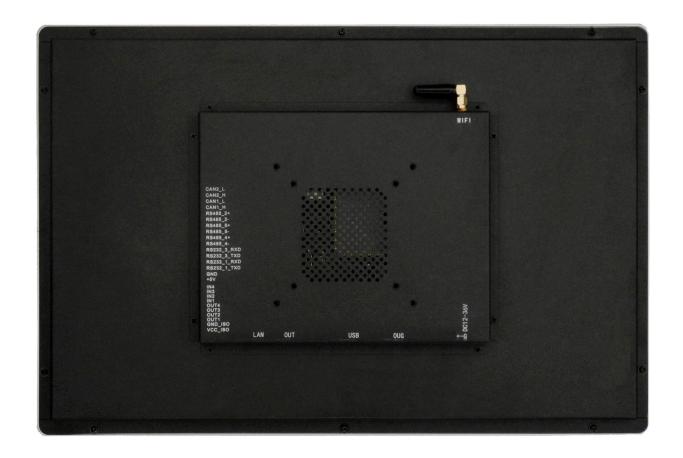
Rear View



Side View 1



Side View 2



PPC-A9-190-C Product Overview

Product Overview

The Cortex[®]-A9 series PPC-A9-190-C (PN: CS14900F190) is a rugged, high-quality industrial panel PC. It features a 19" multi-point capacitive touch screen with a resolution of 1440 x 900 pixels.

Key Applications

- Human Machine Interface HMI
- Process Control
- Process Monitoring
- HMI
- Infotainment
- Predictive Maintenance
- Machine Learning
- Machine Vision
- Automotive applications
- ATM...

The PPC-A9-190-C Industrial Panel PC is based around the powerful CS-SOM-iMX6Q System on Module (SoM), powered by the i.MX6Q Arm[®] Cortex[®]-A9 quad-core Application Processor (APU). The i.MX6Q APU represents the latest achievement in integrated multimedia applications processors, delivering high-performance computing, an abundance of integrated peripherals, and high power efficiency.

This product also features a broad range of connectivity options, providing a high level of scalability for various use cases. It is the perfect solution for power-constrained applications on the Edge, acting as a robust control unit for collecting, processing, and aggregating field data. The i.MX6Q APU is part of NXP's EdgeVerse™ edge computing platform.

The NXP i.MX6UL APU does not generate extensive heat, so even the thin aluminum housing on PPC version delivers sufficient thermal dissipation. With its junction temperature from -40 to +125°C, the APU itself is well suited for extended temperature range in both automotive and factory environments.

PPC-A9-190-C 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-A9-190-C 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 4.3
- · Android 6.0
- Android 8.0
- Ubuntu 12.04
- Ubuntu 14.04
- Debian
- * Chipsee Linux is based on NXP Yocto framework 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 how to install different OS 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.

PPC-A9-190-C **Optional Features**

Optional Features

The PPC-A9-190-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. PPC-A9-190-C Hardware Features

Hardware Features

The PPC-A9-190-C Industrial Panel PC offers a board 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-A9-190-C			
СРИ	iMX6Q, Arm [®] Cortex [®] -A9, 1GHz		
RAM	2GB DDR3		
eMMC	8GB		
Storage	TF Card, Supports up to 32GB SDHC		
Display	19" LCD, 1440 x 900, High Brightness: 500cd/m ²		
Touch	Capacitive Multi-Point Touch Screen		
USB	4 x USB 2.0 HOST, 1 x USB OTG		
LAN	1 x Channel 1000Mbps LAN		
Audio	3.5mm Audio In/Out Connector, Internal 2W Speaker		
Buzzer	Yes		
RTC	Yes, Powered by CR2032 Button Battery		
RS232	2 x RS232		
RS485	3 x RS4851		
CAN	2 x CAN		
GPIO	8 x Channels		
WiFi/BT	Integrated WiFi/BT Module		
НДМІ	1 x HDMI		
SATA	1 x SATA II		
4G/LTE	Optional, Not mounted by default		
Power Input	From 15V to 36V		
Current at 15V	2000mA Max		
Power Consumption	22W Typical		
Working Temperature	From -20°C to +70°C		
OS	Multiple Choices (Operating System)		
Dimensions	466 x 313 x 63mm		
Weight	5200g		
Mounting	Panel		

PPC-A9-190-C Hardware Features

Table 32 Key Features

1 This product has 5 x UART channels in total. The default configuration is 2 x RS232, 2 x RS485, and 1 x UART for WiFi/BT module. 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

PPC-A9-190-C Power Input

Power Input

The PPC-A9-190-C Industrial Panel PC can be powered by a wide range of input voltages: From 15V 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.

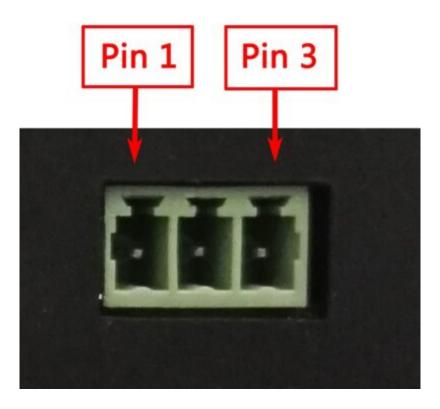


Figure 105: Power Input

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 33 Power Connector

PPC-A9-190-C Power Input



The system ground " \mathbf{G} " is connected to power negative "-" on board.

PPC-A9-190-C Touch Screen

Touch Screen

The PPC-A9-190-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-A9-190-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.

PPC-A9-190-C Connectivity

Connectivity

There are many connectivity options available on the PPC-A9-190-C industrial PC. It has 2 x HOST USB Type A connectors, 1 x USB OTG Type Mini B, 2 x network connector (RJ45) supporting up to 1 Gbps, and 5 x UART terminals (RS232/485). This device also features two CAN interfaces.

RS232/RS485/CAN

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

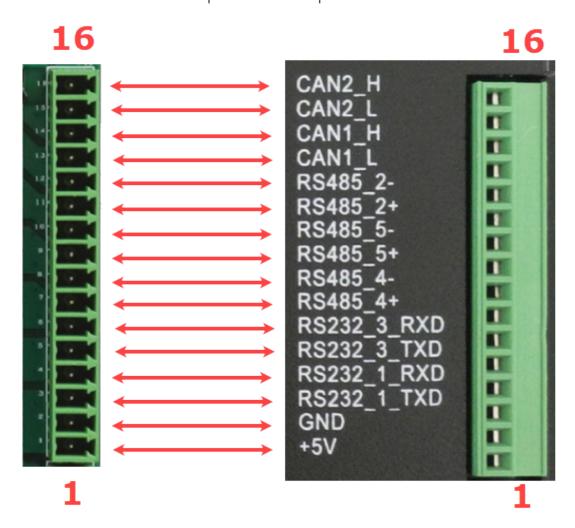


Figure 106: Serial pins connector

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

RS232 / RS485 / CAN Pin Definition:		
Pin Number	Definition	Description
Pin 16	CAN2_H	CPU CAN Channel 2 H signal

PPC-A9-190-C RS232/RS485/CAN

Pin 15	CAN2_L	CPU CAN Channel 2 L signal		
Pin 14	CAN1_H	CPU CAN Channel 1 H signal		
Pin 13	CAN1_L	CPU CAN Channel 1 L signal		
Pin 12	RS485_2-	CPU UART2, RS485 -(B) signal 2		
Pin 11 RS485_2+ Pin 10 RS485_5- Pin 9 RS485_5+		CPU UART2, RS485 +(A) signal 2		
		CPU UART5, RS485 –(B) signal		
		CPU UART5, RS485 +(A) signal		
Pin 8	RS485_4-	CPU UART4, RS485 –(B) signal		
Pin 7	RS485_4+ CPU UART4, RS485 +(A) signal			
Pin 6 RS232_3_RXD		CPU UART3, RS232 RXD signal		
Pin 5 RS232_3_TXD		CPU UART3, RS232 TXD signal		
Pin 4 RS232_1_RXD		CPU UART1, RS232 RXD signal		
Pin 3 RS232_1_TXD		CPU UART1, RS232 TXD signal		
Pin 2 GND		System Ground		
Pin 1	+5V System 5V output, up to 1A			

Table 34 Connectivity Section

2(1,2)UART2 signal is used by the onboard WiFi/BT module, so the I/O port function is disabled by default. If you need the I/O port function instead, please contact Chipsee Technical Support at **support@chipsee.com** for assistance.



 $120\Omega\,termination$ resistors are not mounted or included with the device.

PPC-A9-190-C USB Connectors

USB Connectors

There are 2 x dual Type A **USB HOST connectors** onboard, as shown on the figure below.



Figure 107: USB HOST Connectors



The USB HOST connectors can drive at most 500mA current on each dual port.

There is also 1 x Type Mini B **USB OTG connector**, configured as slave by default.



Figure 108: USB OTG Connector

PPC-A9-190-C LAN Connectors

LAN Connectors

LAN (RJ45) connector provides Ethernet connectivity over standardized Ethernet cables. The integrated Ethernet interface supports up to 1 Gbps data throughput. Power over Ethernet (PoE) is not supported.



Figure 109: RJ45 LAN Connector



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

PPC-A9-190-C WiFi & BT Module

WiFi & BT Module

The PPC-A9-190-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 110: WiFi+BT Antenna

PPC-A9-190-C 4G/LTE Module

4G/LTE Module

The PPC-A9-190-C 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-A9-190-C. SIM card does **NOT** support hot plug. **Power off** before inserting or removing SIM card.

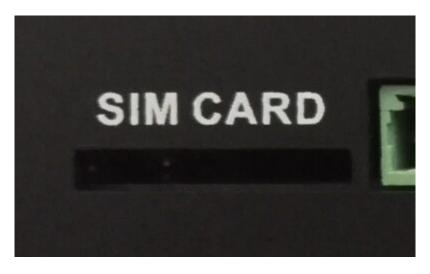


Figure 111: SIM Card Holder



SIM Card Direction



Attention

- 1. The product does not come shipped with the 4G/LTE module by default.
- 2. Also, there is no software driver for any kind of 4G/LTE module on Chipsee store.

PPC-A9-190-C GPIO Connector

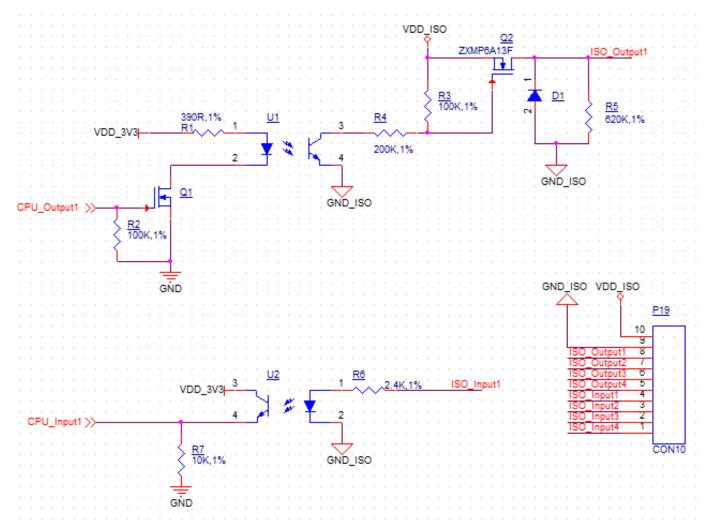
GPIO Connector

The PPC-A9-190-C Industrial Panel PC has a 10 Pin 3.81mm **GPIO Connector**, as shown in the figure below, that is labeled as P28 on the PCB. The table below gives details about the definition of every Pin.



GPIO Connector

PPC-A9-190-C GPIO Connector



Isolated GPIO reduced schematic

GPIO Connector Pin Definition:			
Pin Number	Definition	Description	
Pin 1	VCC_ISO	Isolated Power Input (+5V – +24V)	
Pin 2	GND_ISO	Isolated Ground	
Pin 3	OUT1	Isolated Output 1	
Pin 4	OUT2	Isolated Output 2	
Pin 5	OUT3	Isolated Output 3	
Pin 6	OUT4	Isolated Output 4	
Pin 7	IN1	Isolated Input 1	
Pin 8	IN2	Isolated Input 2	
Pin 9	IN3	Isolated Input 3	
Pin 10 IN4		Isolated Input 4	

Table 35 GPIO Connector Pin-out

PPC-A9-190-C **GPIO** Connector



Attention

• The GPIO has been Opt-Isolated and it uses the 24V Logic by default. 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-A9-190-C Audio Connectors

Audio Connectors

The PPC-A9-190-C Industrial Panel PC features some audio peripherals, as well. It has 1 \times **3.5mm audio input jack** and 1 \times **3.5mm audio output jack**.

The pink connector is the audio input jack (line-in) and the blue connector is the audio output jack (line-out, typically around -10 dBV) as shown on the figure below.

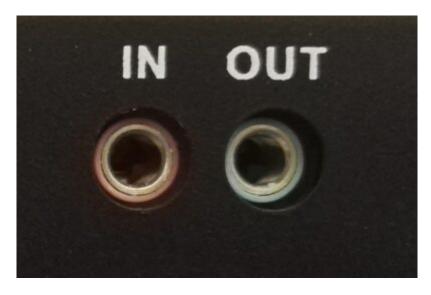


Figure 112: Audio I/O Connectors

PPC-A9-190-C HDMI Connector

HDMI Connector

The PPC-A9-190-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 113: HDMI Connectors

PPC-A9-190-C Boot DIP Switch

Boot DIP Switch

The PPC-A9-190-C Industrial Panel PC supports boot from SD card. If you want to re-flash the Operating System (OS), you can use the TF card for that purpose, combined with the **DIP switch** settings as illustrated in the figure below.

There is no need to alter the DIP switch settings during regular operation. However, if you need to reinstall the OS, please refer to the table below. Detailed information on how to reflash the OS can be found in the Software Documentation.

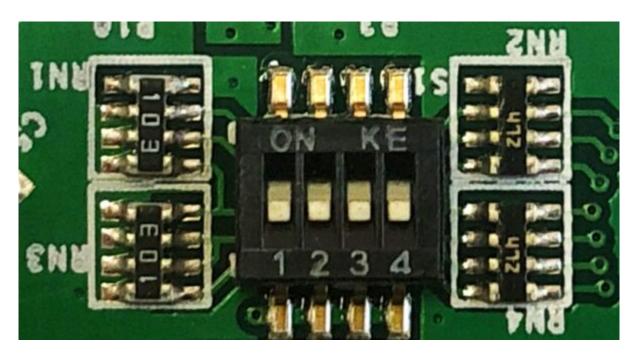


Figure 114: Boot DIP Switch

Boot Config Select				
DIP SW	1	2	3	4
SD	1	0	0	0
еММС	1	1	0	1
Download	0	1	1	0

Table 36 Boot Configuration Selection

Measurements and Mounting Procedure

The outer mechanical dimensions of PPC-A9-190-C are 466 x 313 x 63mm (W x L x H).

The PPC-A9-190-C Industrial Panel PC can be mounted with $8 \times M4$ screws or $4 \times M4$ screws using the VESA (100x100cm or 75x75cm) and Panel mounting methods, enabling simplified installation onto any standard mounting fixture.

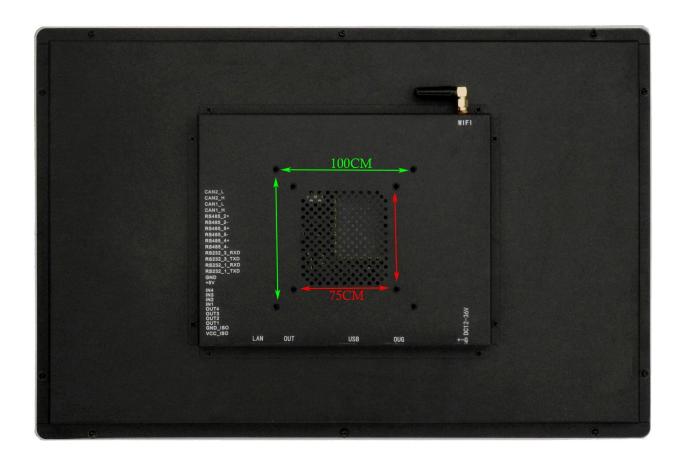


Figure 115: Mounting Method



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-A9-190-C Disclaimer

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