

CNTI-R351

User's Manual



Ver A0.1

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Product Warranty (2 years)

JHC warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by JHC, or which have been subject to misuse, abuse, accident or improper installation.

JHC assumes no liability under the terms of this warranty as a consequence of such events.

Because of JHC's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an JHC product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time and freight. Please consult your dealer for more details.

If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU speed, JHC products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from JHC. Please contact your local supplier for ordering information. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a resident installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, in which case the user will be required to correct the interference at his own expense.

Technical Support and Assistance

- Step 1. Visit the JHC web site at www.jhctech.com.cn where you can find the latest information about the product.
- Step 2. Contact your distributor, sales representative, or JHC's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:
- Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

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CHAPTER

1



General Information

1.1 Introduction

CNTI-R351 is a domestic fan-less box computer of JHC, using SGCC box structure design, powered by Rockchip RK3588 processor, onboard RAM, 4/8/16GB LPDDR4.

CNTI-R351 product provides 1*HDMI display port, 4*Gigabit network ports, 2*USB3.0, 2*USB2.0, 2*COM, 1*8bit DIO, 1*Full size Mini PCIe with SIM card slot, supports 4G LTE or other IO function modules, onboard Wifi6/BT5.0 wireless functionality, 1*M.2 2242 M-key NVMe storage, onboard 64G eMMC, and DC 9-36V wide voltage input. The product size is small, the function is complete, is suitable for industrial applications such as logistics visual inspection, AGV, AMR and intelligent connected vehicle MEC.

1.2 Features

- Aluminum-magnesium alloy, SGCC frame, fanless cooling design
- Rockchip RK3588 CPU, 4-core Cortex-A76 and 4-core Cortex-A55, 2.4GHz Primary Frequency
- Onboard 4/8/16GB memory
- 1*Full size Mini PCIe, with SIM card slot, supports 4G LTE or other IO function modules
- Onboard Wifi6/BT5.0 wireless functionality
- 1*M.2 2242 M-key, supporting PCIe 3.0 X2 NVMe storage
- Onboard 64G eMMC
- 1*HDMI
- 2*RTL8211F RJ45 LAN + 2*RTL8111H RJ45 LAN, 10/100Mbps adaptive or 10/100/1000Mbps adaptive
- Realtek ALC5640 audio chip, Audio out
- 8 bit DIO, 2*USB3.0 TYPE A, 2*USB2.0 TYPEA, 2*COM (1*RS485 and 1*RS232, RS232 is a 3-wire signal, placed in one DB9 interface)
- DC 9~36V wide power input, with reverse connection, over voltage and over current protection

1.3 Specifications

1.3.1 General

CPU: Rockchip RK3588

System Memory: Onboard memory, 4/8/16GB LPDDR4

Serial Ports: 2*COM (1*RS485 and 1*RS232, RS232 is a 3-wire signal, placed in one DB9 interface)

USB: 2*USB3.0 TYPE A, 2*USB2.0 TYPE A

DIO: 8 bit DIO

Expansion Interface:

1*M.2 2242 M-key, supports NVMe storage

1*Full size Mini PCIe, with SIM card slot, supports 4G LTE or other IO function modules

Onboard Wifi6/BT5.0 wireless functionality

Storage:

Onboard 64G eMMC, 1*M.2 2242 M-key, supporting PCIe 3.0 X2 NVMe storage

1.3.2 Display

Chipset: Integrated graphics

Display Memory: Shared system memory

Resolution: HDMI up to 1920* 1080@60Hz

1.3.3 Ethernet

Chipset: 2*RTL8211F + 2*RTL8111H Ethernet controller

Speed: 10/100/1000 Mbps self-adaptive

Interface: 2*RJ45

1.3.4 Audio

Chip: Realtek ALC5640

1.3.5 Power

Input: DC 9-36V

Power Consumption: 14.40W

1.4 Environmental Specifications

Operating temperature: -20°C ~ 60°C, airflow

Relative humidity: 10% ~ 95%@40°C (non-condensing)

Storage temperature: -40 ~ 85°C (-40 ~ 185°F)

EMC: CE, FCC Class A

1.5 Order Information

Model No.	Introduction
CNTI-R351-S001-4G	Fanless box computer, Rockchip RK3588 CPU, 4GB memory, 64GB eMMC, 4*LAN, 2*USB3.0, 2*USB2.0, 2 *COM (1*RS485, 1*RS232), 1*8bit DIO, 2*iso. CAN, 1*HMDI, Audio out, 1*Mini PCIe, 1*M.2 2242 M-Key, on-board WIFI6+BT5.0, DC 9-36V.
CNTI-R351-S001-8G	Fanless box computer, Rockchip RK3588 CPU, 8GB memory, 64GB eMMC, 4*LAN, 2*USB3.0, 2*USB2.0, 2 *COM (1*RS485, 1*RS232), 1*8bit DIO, 2*iso. CAN, 1*HMDI, Audio out, 1*Mini PCIe, 1*M.2 2242 M-Key, on-board WIFI6+BT5.0, DC 9-36V.
CNTI-R351-S001-16G	Fanless box computer, Rockchip RK3588 CPU, 16GB memory, 64GB eMMC, 4*LAN, 2*USB3.0, 2*USB2.0, 2 *COM (1*RS485, 1*RS232), 1*8bit DIO, 2*iso. CAN, 1*HMDI, Audio out, 1*Mini PCIe, 1*M.2 2242 M-Key, on-board WIFI6+BT5.0, DC 9-36V.
PA-60DC12	AC/DC adapter, DC12V/5A 60W

1.6 Structural Specification

CNTI-R351 domestic fanless box computer is assembled by the motherboard EOM-R610 and IO subcard PIB-281, installed in the universal aluminum rectangular profile housing.

Warning: Be sure to turn off the power and unplug before installation, no live operation!

CNTI-R351 Dimension :

Unit: mm

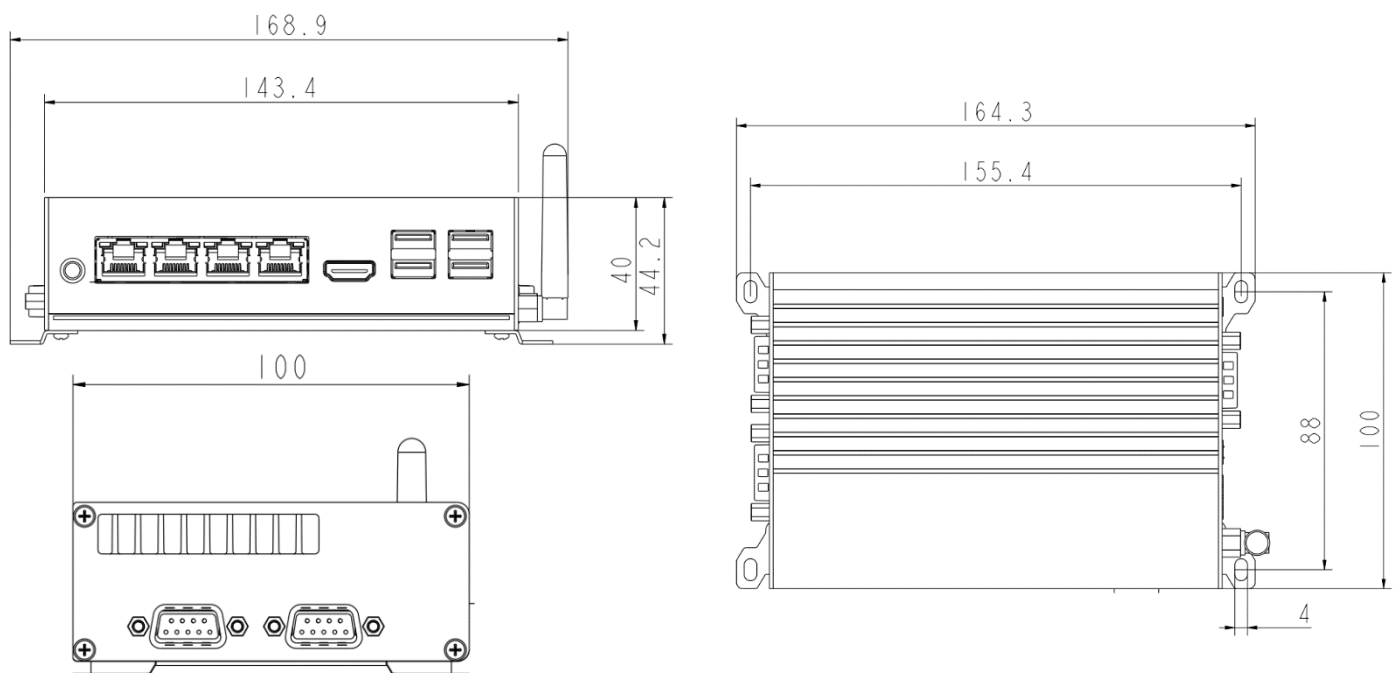


Figure 1.1

CHAPTER

2



Hardware Installation

2.1 Introduction

The following sections describe the external and internal connectors of the product and the corresponding pin assignments.

2.2 I/O Ports

CNTI-R351 Front Panel

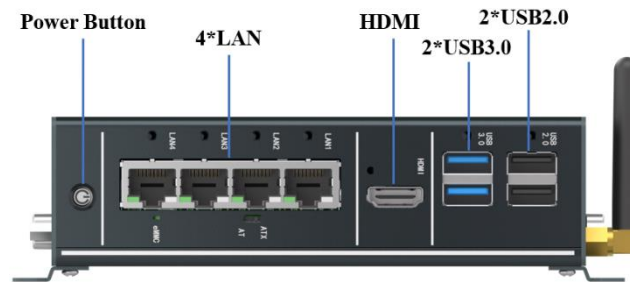


Figure 2.1

Front panel contains I/O interfaces:

- Power button
- 4*LAN
- 2*USB3.0 Type A, 2*USB2.0 Type A
- 1*HDMI

CNTI-R351 Left Panel

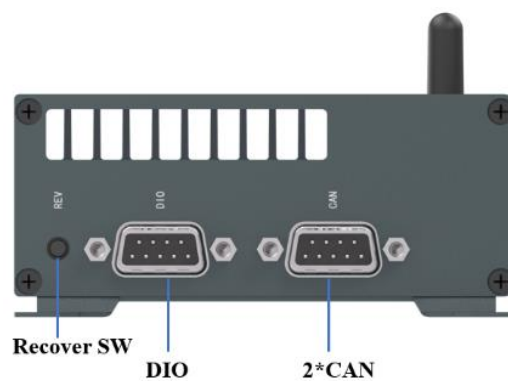


Figure 2.2

Left panel contains I/O interfaces:

- 1*Recover SW
- 1*DIO
- 2*CAN

CNTI-R351 Right Panel

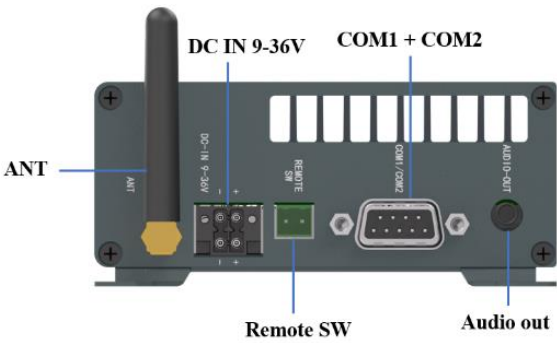


Figure 2.2

Right panel contains I/O interfaces:

- 1*DC IN
- 1*ANT
- 2*COM
- Remote SW
- Audio out

2.2.1 DC IN

The CNTI-R351 provides DC 9 to 36V power input through a 2*2pin 3.5mm pitch terminal. Table 2.1 describes the detailed pin assignment.

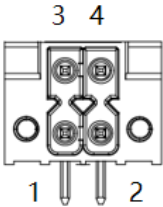


Table 2.1: DC IN interface pin assignments			
Pin	Signal	Pin	Signal
1	V+	2	GND
3	V+	4	GND

2.2.2 LAN

The CNTI-R351 is equipped with two RTL8211F chips and two RTL8111H chips, provides four Gigabit network ports, and supports 10Mbps/100Mbps/1000Mbps adaptive. Table 2.2 describes the detailed pin

assignment.

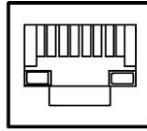


Table 2.2: LAN Port Pin Assignments

Pin	10/100/1000BaseT Signal	Pin	10/100/1000BaseT Signal
1	TX+(10/100), LAN_DA+(GHz)	5	LAN_DC-(GHz)
2	TX-(10/100), LAN_DA-(GHz)	6	RX-(10/100), LAN_DB-(GHz)
3	RX+(10/100), LAN_DB+(GHz)	7	LAN_DD+(GHz)
4	LAN_DC+(GHz)	8	LAN_DD-(GHz)

2.2.3 HDMI

CNTI-R351 provides an HDMI display interface, and Table 2.3 provides a detailed introduction to pin allocation.

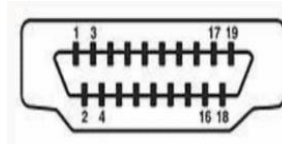


Table 2.3: HDMI Pin Assignments

Pin	Signal	Pin	Signal	Pin	Signal
1	TX2+	8	GND	15	HDMI_SCL
2	GND	9	TX0-	16	HDMI_SDA
3	TX2-	10	TXC+	17	GND
4	TX1+	11	GND	18	P5V_HDMI
5	GND	12	TXC-	19	HDMI_HPD
6	TX1-	13	HDMI_CEC_A		
7	TX0+	14	NC		

2.2.4 USB

There are 4*USB interfaces on the CNTI-R351 panel, including 2*USB3.0 and 2*USB2.0. The following is an introduction to their pin assignments.

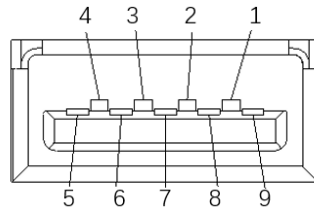


Table 2.4: USB3.0 TypeA Pin Assignments

Pin	Signal	Pin	Signal
1	VCC	6	+SRX0
2	-DATA0	7	GND
3	+DATA0	8	-STX0
4	GND	9	+STX0
5	-SRX0		

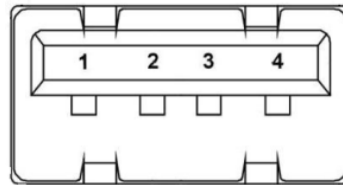


Table 2.5: USB2.0 TypeA Pin Assignments

Pin	Signal	Pin	Signal
1	VCC	2	D0-
3	D0+	4	GND

2.2.5 COM

The CNTI-R351 side panel provides one RS232 serial port and one RS485 serial port through a DB9 single-row thin-layer connector. Detailed pin assignment is described in the following table.

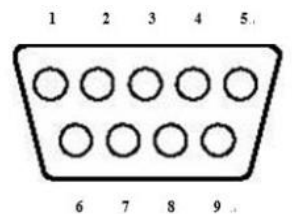


Table 2.6: COM Pin Assignments

Pin	Signal
1	DATA-
2	DATA+
3	NC

4	NC
5	GND
6	NC
7	NC
8	RxD
9	TxD

2.2.6 DIO

CNTI-R351 provides one 8bit DIO through one DB9 connector, and Table 2.7 provides a detailed introduction to pin allocation.

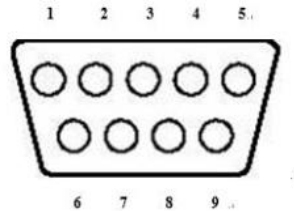


Table 2.7: DIO Pin Assignments	
Pin	Signal
1	GP0
2	GP1
3	GP2
4	GP3
5	GND
6	GP4
7	GP5
8	GP6
9	GP7

2.2.7 CAN

The CNTI-R351 side panel provides two CANs through one DB9 single row thin layer connector. The following table provides a detailed introduction to pin allocation.

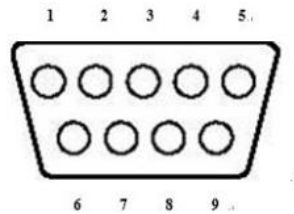


Table 2.8: CAN Pin Assignments	
Pin	Signal
1	CAN1H
2	CAN1L
3	CAN1_GND
4	NC
5	NC
6	CAN2H
7	CAN2L
8	CAN2_GND
9	NC

2.3 Installation

2.3.1 Mini PCIe/M.2 2242 M-key module installation

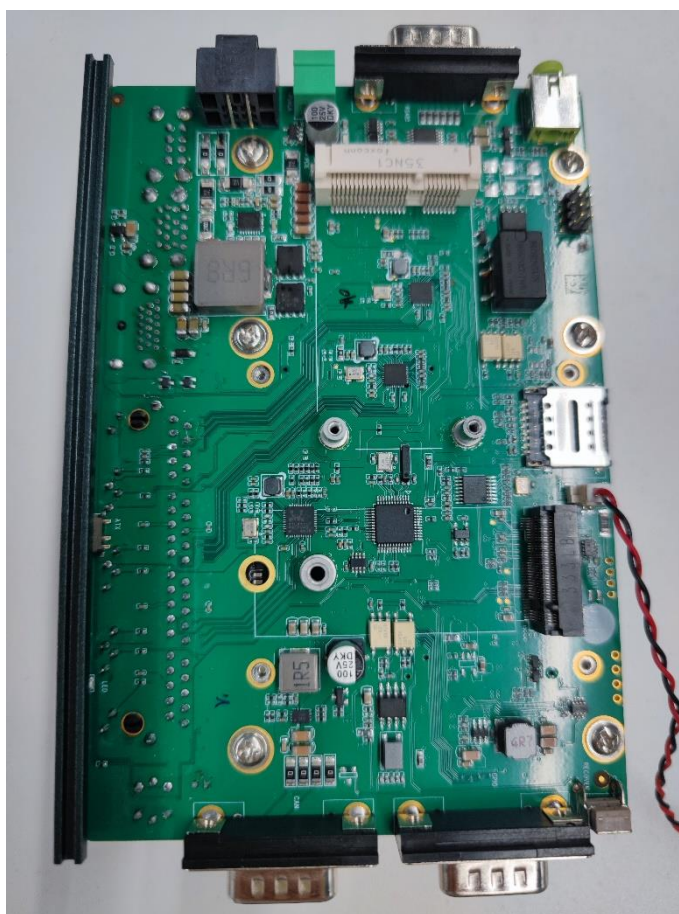
Step 1: Unscrew the six screws on the right panel and remove the right panel;



Step 2: Unscrew the 8 screws on the left panel and remove the left panel;



Step 3: Take off the bottom cover;



Step 4: Hold the Mini PCIe/M.2 2242 M-key module so that its notch is aligned with the Mini PCIe/M.2 2242 M-key slot on the board, insert it into the socket at a 30 degree angle, and tighten 1 screw to secure the installed module;



Step 5: Follow the disassembly steps and use the reverse steps to complete the product installation.