

RTSO-9003U

Product Manual

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Revision History

Revision	Date	Reason for change	Applicable hardware version	Editor
V1.0	2020.2	Initial release	V1.0-V1.7	
V2.0	2020.6	Add notes and indicators	V1.0-V1.7	RT0086
V2.1	2022-03-09	Add software version supporting instructions	V1.0-V1.7	RT0086



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Electronic components and circuits are very sensitive to electrostatic discharge. Although our company designs anti-static protection for the main interfaces on the card when designing circuit board products, it is difficult to achieve anti-static safety protection for all components and circuits. Therefore, it is recommended to observe anti-static safety precautions when handling any circuit board component (including RTSO-9003U). Anti-static safety protection measures include, but are not limited to the following:

- a) The smart box should be placed in an anti-static bag during transportation and storage, and then the board should not be taken out during installation and deployment.
- b) Before touching the smart box, discharge the static electricity stored in the body: wear a discharge grounding wrist strap.
- c) Operate the smart box only within the safe area of the electrostatic discharge point.
- d) Avoid moving smart boxes in carpeted areas.

Precautions and after-sales maintenance

matters needing attention

Before using the product, please read this manual carefully and keep it for future reference;

- Please pay attention to and follow all warning and guidance information marked on the product;
- Please use matching power adapter to ensure the stability of voltage and current;
- Please use this product in a cool, dry and clean place;
- Do not use this product in cold and hot alternate environment to avoid condensation damage components;
- Do not splash any liquid on the product. Do not use organic solvent or corrosive liquid to clean the product;
- Do not use the product in dusty and messy environment. If it is not used for a long time, please pack the product;
- Do not use in the environment with excessive vibration, any dropping or knocking may damage the circuit and components;
- Do not plug and unplug the core board and peripheral modules when power is on;
- Please do not repair or disassemble the product by yourself. In case of any fault, please contact our company in time for maintenance;



- Do not modify or use unauthorized accessories by yourself, and the damage caused will not be warranted;

After sales maintenance

1) Warranty period

- Base plate, core plate : 3 year (non-human damage)
- Other peripherals sold by the company: 1 year (non-human damage)

2) Warranty description

- Within 7 days: the product (base plate, core module) is not damaged by human, our company will replace / repair it free of charge, and bear the return freight; (because the core module needs NVIDIA to confirm that it can meet the requirements of repair, it will take a long time, we will coordinate as soon as possible, please forgive for the inconvenience)
- From 7 days to 36 months: the product (base plate, core module) is not damaged by human, our company will repair it free of charge, and bear the return freight; (because the core module needs NVIDIA to confirm that it can meet the requirements of repair, it will take a long time, we will coordinate as soon as possible, please forgive for the inconvenience)
- Artificial damage in more than 3 year or 3 year: the product (carrier plate) shall be tested after it is sent to the customer, and the customer shall be informed of whether it can be repaired and the maintenance cost in detail. After reaching an agreement, the product shall be repaired and returned to the customer, and the company shall bear the return freight;
- The starting time shall be subject to the date of express delivery receipt;

3) Contact information

Official website: www.realtimesai.com

Taobao website: <https://shop340963258.taobao.com/>

Address: 11, block B, Heping Xiyuan, Heping West Street, Chaoyang District, Beijing

Attention: RMA

Tel: 010-84284669

Mailing notice: contact with the company's sales department in advance, arrange technical support personnel to check and eliminate errors caused by misoperation as soon as possible, fill in the product after-sale return to factory maintenance form after verification, and send it to rma@realtimes.cn Mail box, please attach the list of items to facilitate verification, so as to avoid loss and loss in the process of express delivery. The company does not receive any delivery

Technical support and development customization

1. Scope of technical support

- 1) The company releases the electrical characteristics and use of industrial carrier boards and modules;
- 2) Physical dimension of hardware, relevant structure diagram and line sequence definition of specific interface;
- 3) Burn in verification of all BSP support packages provided by the company;
- 4) The company released burn environment construction, entry-level use. ;
- 5) Various peripheral module drivers released by the company;
- 6) The company's product fault diagnosis and after-sales maintenance services;

2. Scope of technical discussion

Due to the wide range of embedded system knowledge and various types of involvement, we can not guarantee that all kinds of questions can be answered one by one. The following content is not available



for technical support, only suggestions can be provided.

- 1) Knowledge beyond the course published by our company;
- 2) Specific software program design;
- 3) Technical support for industrial carrier not issued by the company;
- 4) All kinds of driving support for industrial carrier board not issued by the company;
- 5) Hardware principle and drive design of peripheral module not issued by our company;

3. Technical support mode

- 1) Official website or email questions (recommended): <https://www.realtimesai.com/cn/download.html>
techsupport@realtimes.cn
- 2) Official Taobao through Alibaba Wangwang consultation: <https://shop340963258.taobao.com/>
- 3) Wechat group consultation (wechat Group No. consults Taobao customer service or sales, and Taobao purchase order No. needs to be provided for verification);
- 4) Technical support email: techsupport@realtimes.cn
- 5) Tel:010-84284669

4. Technical support time

Monday to Friday; 8:30-12:00 am; 1:00-17:30 PM;

The company arranges the rest according to the national legal holidays, during which it may not be able to provide technical support, please send the problem to the technical support email. We will reply to you as soon as possible on weekdays.

5. Complaints and suggestions

If you are not satisfied with us or have suggestions, you can send an email to yu.qin@realtimes.cn For feedback, please call 010-84284669 for further improvement.

6. Customized development services

The company provides the embedded operating system driver based on NVIDIA Jetson series and the paid customized development service of hardware carrier board to shorten your product development cycle.

Please email the request to info@realtimes.cn

Data acquisition and subsequent update

1. Access to information

Download on our website

The company's website contains supporting information of its products, including product user manual, NVIDIA Jetson series module data manual, BSP driver support package for carrier board, supporting peripheral driver files, interface test verification method, FAQ, system burning guide, etc. get into www.realtimesai.com, select "data download" in the navigation bar, find the data you need, and click download.

2. Subsequent updates

Updates of subsequent documents, BSP, driver files and other official account will be updated in time. We will pay close attention to our developments in order to ensure that your information is up to date. We will push through WeChat public.

Product presentation

1 Introduction

The RTSO-9003U is a low-cost, small-volume payload board with the core NVIDIA®Jetson™ TX2 module. The payload board length and width are consistent with the NVIDIA Jetson®TX2 module, suitable for compact deployment requirement. For industrial deployment, the main interface is designed for electrostatic safety protection, the power supply application scheme with high reliability is adopted, and the whole plate device adopts wide temperature model.

1.1 Features

- Compatible with NVIDIA Jetson TX2/TX2i/TX2 4GB module
- 2 x USB 3.0(5Gbps,1A max output current)
- 2 x CAN interface
- 1 x 3.3V UART interface
- 1 x Debug UART interface
- 1 x Gigabit Ethernet(10/100/1000 BASE-T)
- 4 x GPIO compliance with 3.3V voltage level
- 1 x RTC battery interface
- 1 x HDMI TYPE A interface(max 6Gbps, 24bpp, 4096x2160@60Hz)
- 1 x Micro SD card slot
- 1 x 3.3V I2C interface
- 1 x Fan interface
- Size: 87mm × 50mm × 23mm
- Power input: +7~+19V
- Temperature: -40~+80℃
- Weight: 42.6g

1.2 Ordering Information

Model Options	Functional Description
RTSO-9003U	Support Jetson TX2/TX2i/TX2 4GB module, 2 x USB 3.0, 1 x Micro USB 2.0, 1 x HDMI, 1 x GbE, 1 x Micro SD, 2 x 3.3V UART, 1 x I2C , 4 x GPIO, 2 x CAN, RoHS Compliant, Provide Realties RTS Linux4Tegra software support package.
RTS-TXX-AC/DC(option)	TX2 Carrier Board Power Adapter, 100-240VAC/12VDC, 36W
RTSO-9003U-Cable(option)	1 x HDMI to HDMI cable, 1 x USB OTG cable, 1 x multi-function double row pin extension cable (UART, CAN, I2C, GPIO, button, UART remote monitoring), 1 x RTC battery
RTS-TXX-HS02(option)	Active radiator for TX2
RTS-TXX-HS03(option)	Active radiator for TX2 (ultra-quiet)

Order online:

<https://shop340963258.taobao.com>

<https://mall.jd.com/index-824786.html>

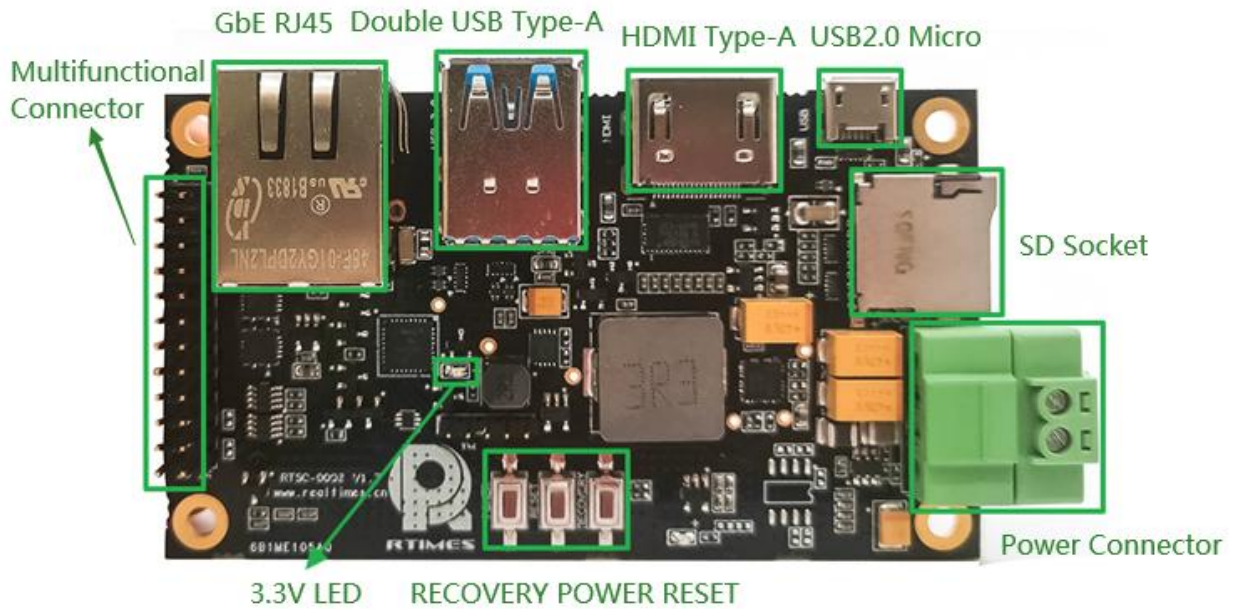
1.3 Cable kits and Accessories

The RTSO-9003U order model of supporting line package is : RTSO-9003U-Cables. Contains the following components

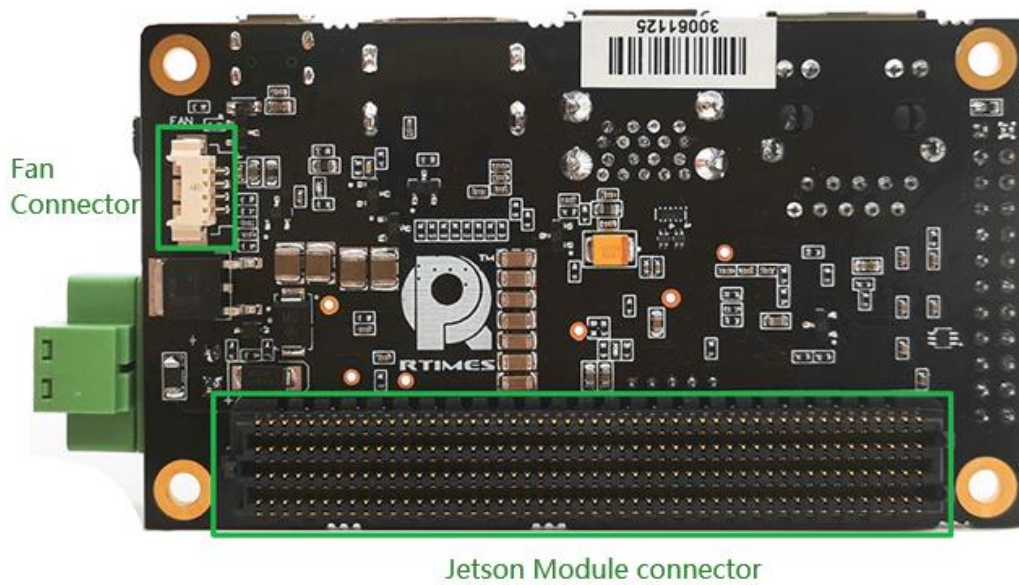
Subassembly	Quantity	Functional Description
Micro USB to USB	one	Convert the onboard Micro USB2.0 interface to a standard USB2.0 interface
HDMI to HDMI cable	one	HDMI to HDMI cable
RTC battery	one	3V RTC battery
Multifunctional line	one	Convert the on-board pin header interface to a cable outlet, which includes the following interface cables: 1 x I2C, 4 x GPIO, 2 x CAN 1 x debug serial port, 1 x serial port, button key lead, 3V RTC clock line

Product specifications

1 External interface function and location



RTSO-9003U front



RTSO-9003U back

1.1 Function Connector

Mandatory Sign	Functional Description
P1	HDMI standard interface
P2	Micro SD (TF) card slot
P3	Double USB3.0 connector
P4	Micro-USB 2.0 OTG interface
P5	Keep interface
P6	Fan interface
P7	2 x 12 Pin Multifunctional connector
P8	Power connector
P9	RJ45 network connector
U1	400 Pin high speed connector, connect the TX2 module

1.2 LED


Mandatory Sign	Functional Description	Status description
D8	3.3V status LED	Normally on - carrier start

1.3 Key and code switch


Mandatory Sign	Functional Description
S1	Power button, For system shutdown and soft shutdown after boot
S2	Recovery button, Used to put the core module into recovery mode
S3	Reset button, Use to restart the core module

2 Connectors Description

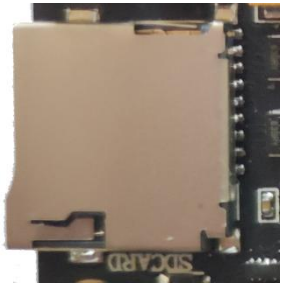
2.1 module interface

Function	Connecting NVIDIA Jetson TX2 core modules	
marking	U1	
Type	Samtec: SEAM-50-03.5-S-08-2-A-K	
Pin define	Refer to the pin definition instructions in the NVIDIA Jetson TX2 core module data book.	

2.2 FAN interface

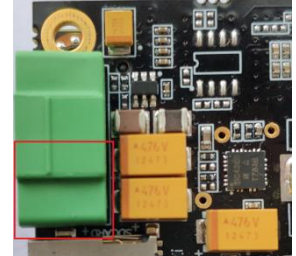
Function	Connect external cooling fan												
Marking	P6												
Type	Molex PicoBlade Header												
Pin define	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GND</td> <td>2</td> <td>+5V</td> </tr> <tr> <td>3</td> <td>TACH</td> <td>4</td> <td>PWM</td> </tr> </tbody> </table> <p>Pin-1: The Green box on the right.</p>		Pin	Signal	Pin	Signal	1	GND	2	+5V	3	TACH	4
Pin	Signal	Pin	Signal										
1	GND	2	+5V										
3	TACH	4	PWM										

2.3 Micro SD card slot

Function	Micro SD (TF) slot																								
Marking	P2																								
Type	Micro SD (TF)																								
Pin define	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Pin</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SDIO_DATA2</td> <td>2</td> <td>SDIO_DATA3</td> </tr> <tr> <td>3</td> <td>SDIO_CMD</td> <td>4</td> <td>SDIO_VCC</td> </tr> <tr> <td>5</td> <td>SDIO_CLK</td> <td>6</td> <td>GND</td> </tr> <tr> <td>7</td> <td>SDIO_DATA0</td> <td>8</td> <td>SDIO_DATA1</td> </tr> <tr> <td>9</td> <td>GND</td> <td>10</td> <td>SDIO_CD</td> </tr> </tbody> </table>		Pin	Signal	Pin	Signal	1	SDIO_DATA2	2	SDIO_DATA3	3	SDIO_CMD	4	SDIO_VCC	5	SDIO_CLK	6	GND	7	SDIO_DATA0	8	SDIO_DATA1	9	GND	10
Pin	Signal	Pin	Signal																						
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7	SDIO_DATA0	8	SDIO_DATA1																						
9	GND	10	SDIO_CD																						

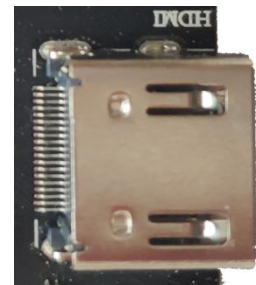
2.4 Power connector

Function	Power input terminal			
Marking	P8			
Type	3.81mm Power terminal			
Pin define	Pin	Signal	Pin	Signal
	1	VCC (+)	2	GND (-)
	Pin-1: The red box on the right. Input voltage range: +7v~+19v Do not connect the cable with electricity!			



2.5 HDMI Type- A interface

Function	Connecting the display			
Marking	P1			
Type	Type-A			
Pin define	Pin	Signal	Pin	Signal
	1	TMDS DATA2+	2	TMDS DATA2 GND
	3	TMDS DATA2-	4	TMDS DATA1+
	5	TMDS DATA1 GND	6	TMDS DATA1-
	7	TMDS DATA0+	8	TMDS DATA0 GND
	9	TMDS DATA0-	10	TMDS CLOCK+
	11	TMDS CLOCK GND	12	TMDS CLOCK-
	13	CEC	14	NO CONNECT
	15	DDC CLOCK	16	DDC DATA
	17	DDC GND	18	+5V POWER
	19	HOT PLUG DETECT		



2.6 Ethernet interface

Function	Ethernet connector			
Marking	P9			
Type	RJ45			
Pin define	Pin	Signal	Pin	Signal
	1	TP0+	2	TP0-
	3	TP1+	4	TP2+
	5	TP2-	6	TP1-
	7	TP3+	8	TP3-



2.7 USB Type-A interface


Function	USB3.0 connector			
Marking	P3			
Type	Type-A			
Pin define	layer		superstratum	
	Pin	Signal	Pin	Signal
	1	VBUS	2	USB 2.0 D-
	3	USB 2.0 D+	4	GND
	5	SSRX-	6	SSRX+
	7	GND	8	SSTX-
	9	SSTX+		
	layer		substratum	
	Pin	Signal	Pin	Signal
	1	VBUS	2	USB 2.0 D-
	3	USB 2.0 D+	4	GND
	5	SSRX-	6	SSRX+
	7	GND	8	SSTX-
	9	SSTX+		



2.8 USB Micro interface

Function	USB2.0 connector			
Marking	P4			
Type	Micro USB 2.0 Type-B			
Pin define	Pin	Signal	Pin	Signal
	1	VBUS	2	USB 2.0 D-
	3	USB 2.0 D+	4	USB ID
	5	GND		

USB-OTG is in host mode, USB ID pins to float.
 USB-OTG is in slave mode, USB ID the pins should be grounded.



2.9 Multifunctional Connector

Function	Multi-function low speed signal interface			
Marking	P7			
Type	2.54mm ,2x12Pin Double row pins			
Pin define	Pin	Signal	Pin	Signal
	1	3.3V	2	3.3V
	3	UART0_TX	4	UART0_RX
	5	UART1_TX	6	UART1_RX
	7	GPIO0	8	GPIO1
	9	GPIO2	10	GPIO3
	11	I2C_CLK	12	I2C_DAT
	13	RECOVERY	14	RTC-BAT
	15	RESET	16	REMOTE_TX
	17	POWER_BUTTON	18	REMOTE_RX
	19	GND	20	GND
	21	CAN1H	22	CAN1L
	23	CAN0H	24	CAN0L

The serial port level is 3.3V TTL logic level.

The mapping files in the /dev directory corresponding to UART0 and UART1 are ttyS0, ttyTHS2

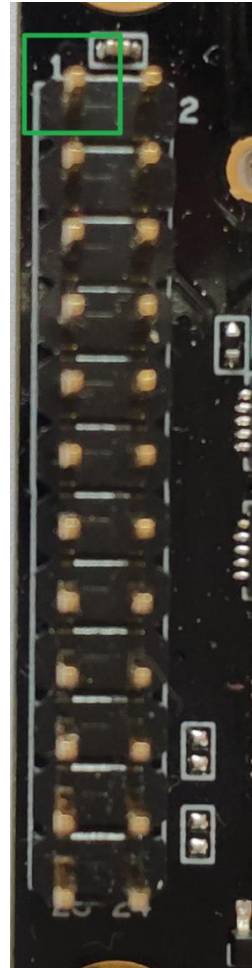
UART0 is the kernel debugging serial port by default, which is used to output c-boot, u-boot and Linux kernel information. After Linux kernel is started, it is used as the serial port of display control terminal.TX2 The default serial port is set to 115200bps,8N1

The sysfs mapping Numbers of GPIO0~GPIO3 in the TX2 system are:388,298,480,486

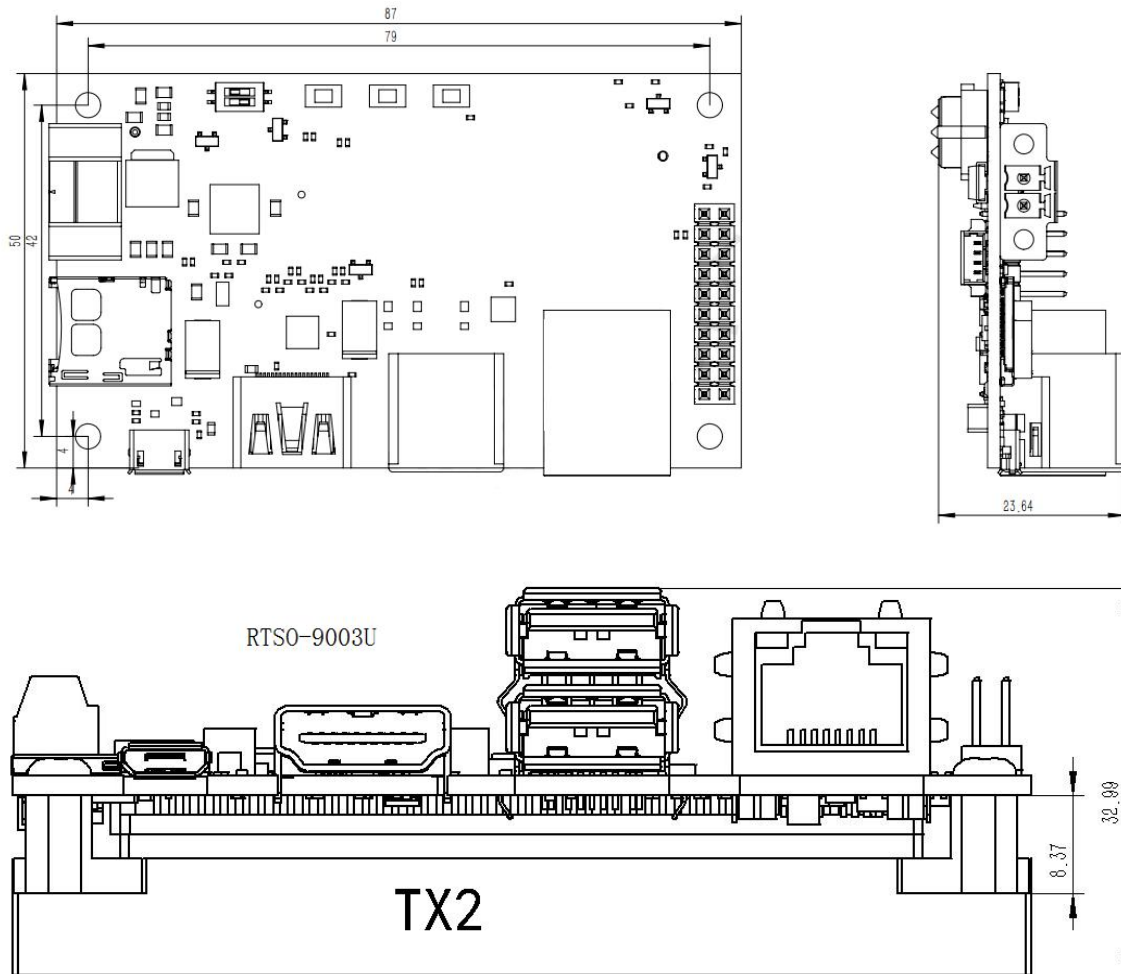
GPIO high level state is 3.3v.

The resulting I2C bus corresponds to the iic-0 bus in the Linux system.

RTC-BAT pin is RTC Clock power input (+3V)



3 Product size



4 Hardware update history

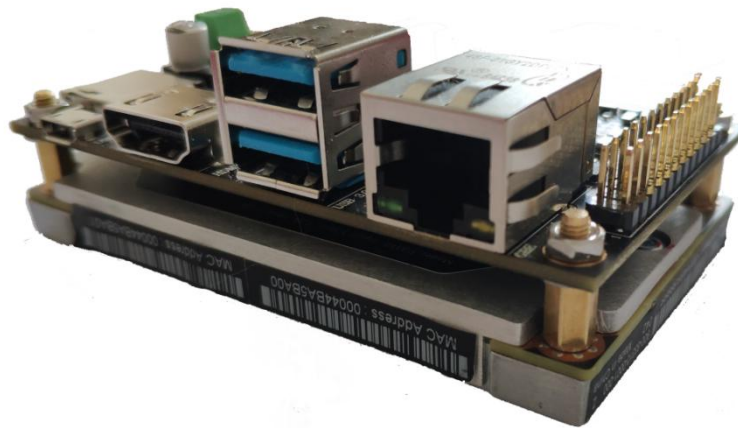
RTSO-9003U Board hardware update history

edition	Updata description
V1.0	Initial release
V1.1	Fix power supply circuit error
V1.2	Handle floating IO ports, Remove redundant CAN circuits, Adjust screen printing information
V1.3	Change the IO interface circuit, Adjust the location of the USB OTG socket, Adjustable inductance package
V1.4	Change screen information
V1.5	Change key package, Change the logo and other screen printing information
V1.6	Modify IO interface chip package welding resistance layer
V1.7	Replace the power terminal, Replace the power terminal Change the positive and negative direction of the power terminal, Replace the power chip, Modify USB earthing mode, Modify the HDMI interface circuit, Adjust interface placement

Software version supporting instructions

1 Installation and use

1.1 picture of products



1.2 How to use the board

The carrier board cannot work alone, it needs to be used in conjunction with the TX2 module. After aligning the inter-board connector with the module high-speed connector, press evenly with both hands to connect it; and use the screws provided with the product to reinforce and fix it.

Before using the 9003U carrier board, you must confirm that the TX2 core module has an operating system loaded with realtimes BSP. For the installation of the operating system and jetpack, please refer to the [TX2 system instruction manual](#) (Ruitai cloud network disk/help document).

- a) Make sure the external system is powered off
- b) Install the TX2 core module to the U1 connector, Please pay attention to the alignment between connectors during installation, Force uniformity, apply uniform force, and install the fixing screw at the same time.
- c) Install necessary external cables.(e.g., the display cable to the HDMI monitor, the power input cable to power the system, the USB cable to connect the keyboard and mouse...).
- d) Connect the power cord to the power supply.
- e) RTSO-9003U adopts automatic power on design. Turn on the power and the system starts to work.
- f) For systems without protective enclosure, please avoid moving the whole system after the system is powered on. It is strictly prohibited to touch the circuit board and its electronic components.

Jetson TX2 modules are designed to optimize power efficiency and support multiple software-defined power modes. These power modes limit the budget of the module to around 7.5W or 10W or 15W by limiting the GPU and CPU frequencies and the number of CPU cores online to pre-approved levels. For

detailed information and settings of the power mode, you can check the help document [Jetson platform working mode settings and tegrastats status query](#).

1.3 Recovery Mode

Jetson TX2 core module can work in normal mode and Recovery mode, In the Recovery mode, file system update, kernel update, boot loader update, BCT update and other operations can be performed.

Procedure to place system in Force USB Recovery Mode:

- a) Power down the device.
- b) Use USB cable to connect otg-usb port (P4) of RTSO -9003U with Host(PC) to develop host USB port
- c) Press the RECOVERY button without releasing it to power the system. The power supply should be maintained for more than 3 seconds, and then release the RECOVERY button.
- d) After the system enters the Recovery mode, subsequent operations can be carried out.

2 L4T (Linux for Tegra Abbreviation“L4T”)

The RTSO-9003U board works on systems that burn using the official original NVIDIA Linux For Tegra (L4T) ,HDMI, gigabit Ethernet, USB2.0, serial port, GPIO, SD card, I2C bus, fan interface, can be supported. But USB3.0 can't work normally.

The full support of RTSO-9003U rugged machine interface needs to load supporting driver patches.

NVIDIA LT4 package can be downloaded from the following link

<https://developer.nvidia.com/embedded/linux-tegra>

RTSO-9003U patch support package download

<https://www.realtimesai.com>

For the installation of the operating system and jetpack, please refer to the [TX2 system instruction manual](#) (Ruitai Cloud Network Disk/Help Documentation/Jetsonx System Burning and Backup Directory).

RTSO-9003U board level patch support package download jump link:

<https://www.realtimes.cn/cn/software.html>

3 Other related introductions

3.1 Jetpack

Nvidia jetpack sdk is the most comprehensive solution for building AI applications. It includes software libraries and APIs, samples, developer tools and documentation for the latest and previous versions of Jetson products.

3.1.1 Jetpack Component summary

This section briefly introduces each component of JetPack. For more detailed information about these components, please refer to JetPack's online documentation.

OS Image

JetPack includes a reference file system derived from Ubuntu. (Development kit system, no need to install)

Libraries and APIs

JetPack library and API include:

- TensorRT and cuDNN for high-performance deep learning applications
- CUDA for multi-domain GPU accelerated applications
- NVIDIA Container Runtime for containerized GPU accelerated applications
- Multimedia API package for camera application and sensor driver development
- VisionWorks, OpenCV and VPI for visual computing applications
- Sample application

3.1.2 How to install Jetpack

Overview of process steps

Installing JetPack to your Jetson device requires you to perform the following steps:

1. Download and install the NVIDIA SDK Manager on the Linux host.
2. Connect your jetson device to the Linux host (Micro USB or network (same network segment)).
3. Test your device can connect via ssh.
4. Use SDK Manager to select and install the required components.

Download and install the NVIDIA SDK Manager on the Linux host.

You must have a Linux host with internet access to run SDK Manager and refresh the developer kit. The supported host operating systems are:

Ubuntu Linux x64 Version 18.04 or 16.04

Download and install NVIDIA SDK Manager.

sdkmanager Installation package: **sdkmanager-[version].[build#].deb**

The current version is: **sdkmanager_1.2.0**

sdkmanager install

\$ sudo apt install ./sdkmanager-[version].[build#].deb

Connect your jetson device to the Linux host

Prepare your Jetson device for the following settings. (If the equipment system is not initialized, the system user needs to initialize after power-on)

- Connect the monitor, keyboard and mouse to the Jetson device (RTSO9003U + Jetson TX2) (please refer to the interface description above).
- Use Micro USB cable to connect Linux host and OTG-USB port (P4) of RTSO-9003U (or network

(same network segment))

- During the setup process, SDK Manager will provide Internet connection for your jetson Feiyun Smart Box via USB or network connection.
- Connect the supplied power adapter to the DC jack of the Feiyun Smart Box, and plug the AC interface into an AC power outlet.

Test that your device can connect via ssh.

If connected via Micro USB, enter lsusb under the Linux host terminal to see the nvidia crop

The device can be accessed through ping or ssh commands

```
$ ping 192.168.55.1
```

or

```
$ ssh <jetson_user>@192.168.55.1
```

If connected via a network, check whether the device ip address is in the same network segment as the Linux host on the Feiyun Smart Box, and the Feiyun Smart Box device can be accessed through the ping or ssh command.

```
$ ping <jetson_ip>
```

or

```
$ ssh <jetson_user>@<jetson_device_ip>
```

Use SDK Manager to select and install the required components

NVIDIA SDK Manager supports installing software to Jetson core (Flying Cloud Smart Box). For complete instructions, please refer to Chapter 5 of "[TX2 System Programming Manual](#)".

3.2 Developer tools

JetPack includes the following development tools. Some are used directly on the Jetson system, and some run on a Linux host connected to the Jetson system.

• Application development and debugging tools

- NSight Eclipse version for GPU-accelerated application development: runs on a Linux host. All Jetson products are supported.

- CUDA-GDB for application debugging: Runs on a Jetson system or a Linux host. All Jetson products are supported.

- CUDA-MEMCHECK to debug application memory errors: run on Jetson systems. All Jetson products are supported.

• Application analysis and optimization tools

- NSight Systems for application multi-core CPU profiling: runs on a Linux host. Helps you improve application performance by identifying slow parts of your code. All Jetson products are supported.

- NVIDIA® Nsight™ compute kernel profiler: an interactive profiling tool for CUDA applications. It provides detailed performance metrics and API debugging through the user interface and command line tools.



• NSight Graphics for Graphics Application Debugging and Profiling: A consolegrade tool for debugging and optimizing OpenGL and OpenGL ES programs. Running on a Linux host. All Jetson products are supported.

3.3 Documentation

Documents related to developers using JetPack include:

- [JetPack Documentation](#)
- [VisionWorks Documentation](#)
- [Nsight Eclipse Edition Documentation](#)
- [CUDA-GDB Documentation](#)
- [CUDA-MEMCHECK Documentation](#)
- [TensorRT Documentation](#)
- [cuDNN Documentation](#)
- [CUDA Toolkit](#)
- [NVIDIA Container Runtime](#)
- [OpenCV Documentation](#)
- [Jetson Linux Multimedia API Reference](#)
- [Nsight Systems](#)
- [nvprof](#)
- [Visual Profiler](#)
- [Nsight Graphics](#)
- [Nsight Compute CLI](#)
- [VPI-Vision Programming Interface](#)

Terms of Warranty

Important note

Each embedded product provided by Realtimes Technology is free from any defects in material and process,fully in line with the specifications officially issued by the original factory.

Realtimes Technology warranty covers the original products,If the parts configured by the dealer are out of order, please consult with the dealer to solve the problem. All the baseplate and core modules provided by Ruitai New Era (Beijing) Technology Co., Ltd. are guaranteed for 3 years, while the other peripherals are guaranteed for 1 year (life-long maintenance service is provided if the warranty period is beyond the warranty period).The warranty period starts from the date of delivery, for the products repaired within the warranty period, the repair parts shall be extended for 12 months.Unless notified by Realtimes Technology, the date of your original invoice shall be the date of shipment.

How do I get warranty services

If the product does not work properly, Please contact Realtimes Technology or dealer for warranty service, please show invoice when product warranty(this is the proof for you getting warranty service).

Warranty solution

When you ask for warranty service, please follow Realtimes Technology warranty process,You will need to receive your first diagnosis from a technical engineer by phone or by email,at that time,we need you to cooperate with us to fill in all the questions on the RMA form provided by us. Once we accurately determine the cause of the fault and the location of the damage ,we will provide the charge list for the out of warranty products,which needs your confirmation.Realtimes Technology keep the right to repair or replace the products. If the product is replaced or repaired, the replaced faulty product or the repaired and replaced faulty parts will be returned to Realtimes Technology.

For products under warranty,the customer shall bear the freight when the product is returned to the manufacturer,Realtimes Technology will bear the ship cost of the products after maintenance.

The following conditions are not covered by the warranty terms

- a) Improper installation, improper use, misuse and abuse of products(Overloading, for example).
- b) Improper maintenance and storage (Such as fire, explosion, etc) or natural disasters (such as lightning stroke,earthquake,typhoon,etc)
- c) Personal unauthorized changing the product(such as changing circuit characteristics, mechanical characteristics, software characteristics,Conformal coating).
- d) Other failures which are clearly due to misuse(such as overvoltage,polarity reversal, the pin bent or broken,the wrong connection,drop damage,transportation damage,damage due to over operating temperature and so on).
- e) The logo and part number on the product have been deleted or removed.
- f) The product is out of warranty.

Special concerns



If the same fault multiple occurrence for the products,in order to find out the reason causing the problem,we will request the users to provide the specific documents or information of peripheral equipment,such as monitor,I/O boards,cables,power supply, diagram and structure of the system,etc.If such documents or information are not available,we have the right to refuse to perform the warranty, the repairments will be charged accordingly.

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