

## **VT-HMI04-RK3326S Hardware User Manual**

**Product Version: 3.0**

**Date: February 28, 2025**

# **Vantron**

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## Change History

This table describes the version and release date.

| Rev. | Date               | Description                                                           | Author       |
|------|--------------------|-----------------------------------------------------------------------|--------------|
| 1.0  | September 5, 2024  | First release                                                         | Xuening Wang |
| 2.0  | September 27, 2024 | To illustrate that need to use a hub with power supply for debugging. | Xuening Wang |
| 3.0  | February 28, 2025  | Product appearance drawings update and add FCC-IC-CE WARNING.         | Xuening Wang |

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## Foreword

### Copyright

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### Symbol Conventions

The symbols that may be found in this document are defined as follows.

| Symbol                                                                              | Type    | Description                                              |
|-------------------------------------------------------------------------------------|---------|----------------------------------------------------------|
|  | Notice  | Important information and regulations                    |
|  | Caution | Caution for latent damage to system or harm to personnel |

### Statement & Disclaimer

It is recommended to read and comply with this manual which provides important guidance and helps decreasing the danger of injury, electric shock, fire, or any damage to the device.

Vantron assumes no legal liability of accidents resulting from failure of conforming to the safety instructions.

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## **Limitation of Liability/Non-warranty**

For direct or indirect damage to this device or other devices of Vantron caused by failure of conforming to this manual or the safety instructions on device label, Vantron assumes neither warranty nor legal liability even if the device is still under warranty.

The device should be installed, debugged and maintained by professionals.

The outside antennas are not permitted to be installed or to be changed by non-professionals. To run the device normally, only specified antennas are approved to be assembled together by professionals.

Unit shall be used with indoor-use antenna only. No antenna for this unit can be installed outdoor.

## **Safety Instructions**

- ✧ Keep and comply with all operation instructions, warnings, and information.
- ✧ Pay attention to warnings on this device.
- ✧ Read the following precautions so as to decrease the danger of injury, electric shock, fire, or any damage to the device.
- ✧ Operations and service instructions are provided with the equipment.
- ✧ Unit shall be used with indoor-use antenna only. No antenna for this unit can be installed outdoor.
- ✧ The maximum operation temperature is 45°C.

## **Precautions**

- ✧ Pay attention to the product labels/safety instructions printed on silk screens.
  - ✧ Do not try repairing this product unless declared in this manual.
  - ✧ Keep away from heat source, such as heater, heat dissipater, or engine casing.
  - ✧ Do not insert other items into the slot (if any) of this device.
-

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- Keep the ventilation slot unclogged.
  - System fault may arise if other items are inserted into this device.
- ✧ Installation: ensure correct installation according to instructions from the manufacturer with recommended installation tools.
- ✧ Ensure ventilation and smoothness according to relevant ventilation standards.

## **Safety Instructions for Power Cables and Accessories**



Use Proper power source only. Start only with power source that satisfies voltage label and the voltage necessary according to this manual. Please contact technical support personnel of Vantron for any uncertainty about the requirements of necessary power source.



Use tested power source. This product still contains a button lithium battery as a real-time clock after its external power source is removed and therefore should not be short-circuited during transportation or placed under high temperature.



Place cables properly: Do not place cables at any place with extrusion danger.

## **Cleaning Instructions**

- ✧ Please power off before cleaning the device.
- ✧ Do not use spray detergent.
- ✧ Clean with a damp cloth.
- ✧ Do not try cleaning exposed electronic components unless with a dust collector.
- ✧ Support for special fault: Power off and contact technical support personnel of Vantron in case of the following faults:
- The temperature is excessively high. The device is damaged.
  - The temperature is excessively high.
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- Fault is still not solved after operations according to the manual.

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## 1. Introduction

### 1.1 Product Description

Vantron offers both ARM- and ATOM- based Single Boards Computer (SBC) platforms including Cirrus Logic EP9315, RockChip RK3128, RK3368, RK3288, RK3399, MediaTek MTK8362, MTK8365, X8, TI OMAP35xx CortexA8 series, and Intel Skylake and ApolloLake processor boards. In addition to offering the standard SBCs, we also provide professional customization board design services. Our seamless project management, efficient error-free development process, strong fundamentals in technology, sufficient human resources and on-time delivery will guarantee the success in your project development.

Being 'Application Ready', our embedded computers have embedded basic operation system which includes the drivers for the interfaces. So it is easy to be used by adding your application software only. It can speed Time to Market of your products and save more cost.

### 1.2 Connector Description

This table respectively describes the valid signal of connectors on the Vantron board.

|     |                               |
|-----|-------------------------------|
| N/C | Not connection                |
| GND | Grounding                     |
| /   | Active low signal             |
| +   | Positive of difference signal |
| -   | Negative of difference signal |

|         |                    |
|---------|--------------------|
| I       | Input              |
| O       | Output             |
| I/O     | Input/output       |
| P       | Power or grounding |
| A       | Analog             |
| OD      | Open drain         |
| CMOS    | 3.3V CMOS          |
| LVC MOS | Low-voltage CMOS   |
| LVTTL   | Low-voltage TTL    |
| 3.3V    | 3.3V signal level  |

---

|      |                                         |
|------|-----------------------------------------|
| 5V   | 5V signal level                         |
| USB  | 5V tolerant signal                      |
| PCIe | PCI Express signal (not 3.3 V tolerant) |
| NC   | No Connection                           |

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## 2. Overview

### 2.1 Introduction

VT-HMI04-RK3326S is a HMI based on Rockchip RK3326-S mobile communication multimedia processor, equipped with Android system and 4" LCD, designed for desktop and wall-mounted display equipment. The main application scenario is WLAN use. Support 2.4/5.8G Wi-Fi 6 and Bluetooth 5.4. Only support power supply through USB Type-C interface, and supports front camera and NFC for identification.

### 2.2 Feature

| VT-HMI04-RK3326S-SNC Function List-Hardware |                  |                                                                                                            |
|---------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------|
| Item                                        | Function         | Detail Specification                                                                                       |
| Mini System                                 | CPU              | RK3326-S, 4xcore ARM Cortex-A35 (1.5Ghz)                                                                   |
|                                             | GPU              | G31-2EE                                                                                                    |
|                                             | RAM              | LPDDR4 4GB, 32bit                                                                                          |
|                                             | PMIC             | RK817-6                                                                                                    |
|                                             | Flash            | eMMC V5.1 64GB                                                                                             |
| EEPROM                                      | EEPROM           | 2Kbit, For Device information.                                                                             |
| Media                                       | Display          | Support 4" Pixel 720x720, IPS Full View, 300cd/m2. MIPI interface. Color Depth 16.7M                       |
|                                             | Touch            | Supply I2C interface for TP control.                                                                       |
|                                             | Camera           | CSI MIPI interface and 5Mp. Supply FPC connector with 1x31x0.3mm. Support auto Focus and scan Bar/QR Code. |
| Power                                       | Power in         | Power input with type-C, support 5V/2A Power input.                                                        |
| Interface                                   | Type-C           | Power supply Type-C.                                                                                       |
|                                             | Button           | Volume +/- and Power on/off button. Reset button.                                                          |
| Wireless                                    | Wi-Fi /Bluetooth | AIC8800D80 WiFi 6, Bluetooth 5.4. Single antenna. SDIO&UART&PCM interface                                  |
|                                             | NFC              | Support NFC with PN7160                                                                                    |
| Debug CON                                   | UART             | UART 1.8V level.                                                                                           |
| Software                                    | operation        | Android                                                                                                    |

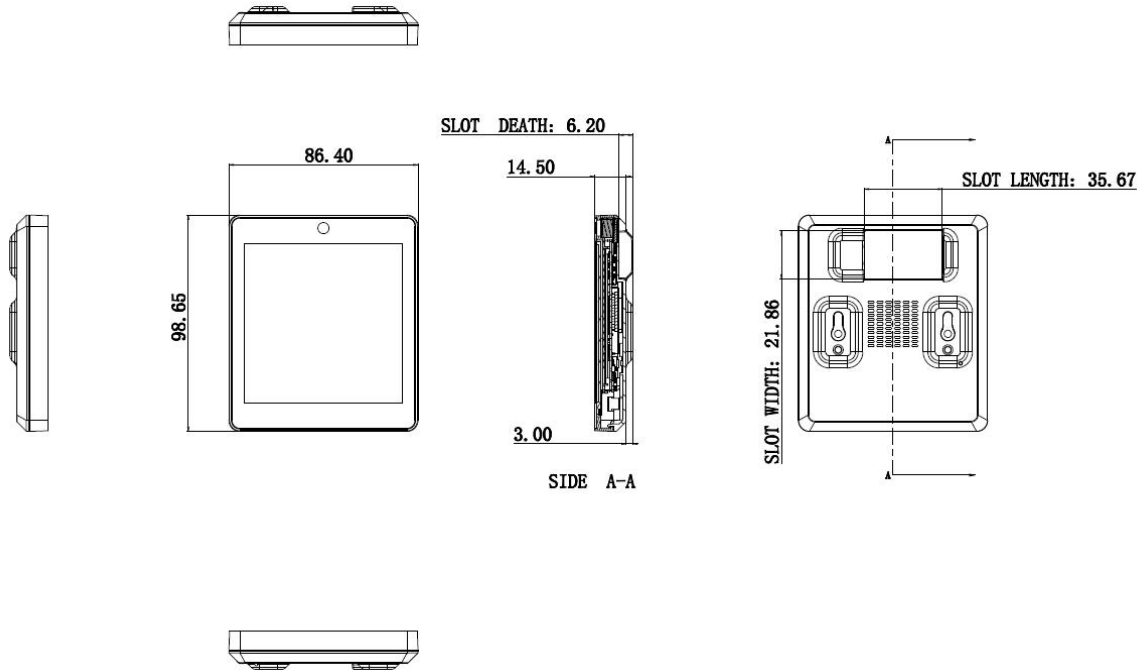
|                    |                        |                              |
|--------------------|------------------------|------------------------------|
|                    | <b>system</b>          |                              |
| <b>EMC</b>         | <b>FCC</b>             | FCC Part 15 Class B          |
|                    | <b>ESD</b>             | Air 8KV and Connect 4KV      |
| <b>Temperature</b> | <b>Operation Temp.</b> | Operating 0~45°C, RH 20%-80% |
|                    | <b>Storage Temp.</b>   | Storage -20~60°C             |

## 2.3 Order Information

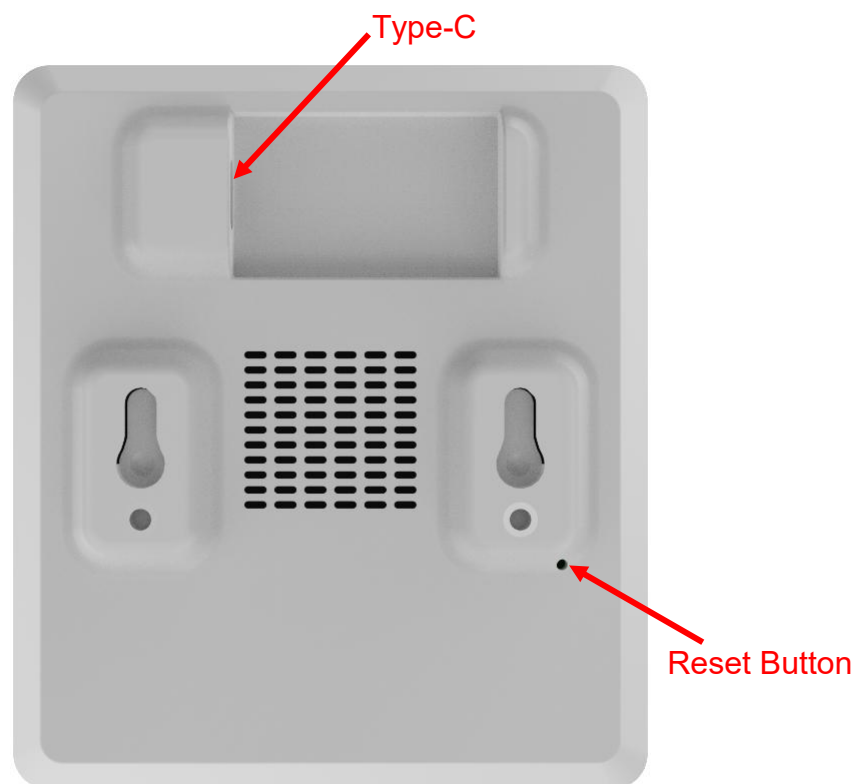
| Part Order Example |                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VT-HMI04-RK3326S   | <ul style="list-style-type: none"> <li>● RK3326-S, 4xcore ARM Cortex-A35 (1.5Ghz)<br/>eMMC 64 GB<br/>LPDDR4 4GB,32bit</li> <li>● 5MP Camera</li> <li>● Power input with type-C, support 5V/2A Power input</li> <li>● Support 4" Pixel 720x720 screen</li> <li>● Volume +/- ,Power on/off button and Reset button</li> <li>● AIC8800D80 Wi-Fi 6, Bluetooth 5.4</li> <li>● Support NFC with PN7160</li> </ul> |

### 3. Hardware Instructions

#### 3.1 Appearance



#### 3.2 Interface Description



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### 3.3 Structure

Download the board structure document from Vantron technology or Vantron net site:

[www.vantrontech.com.cn](http://www.vantrontech.com.cn)

Unit: mm

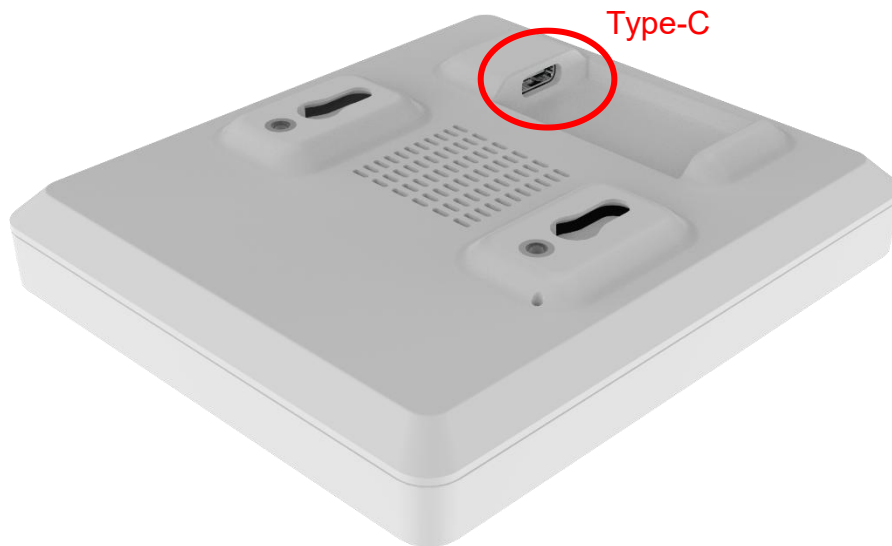
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## 4. Hardware Function Description

This chapter mainly describes the main hardware functions of this product, including Wi-Fi/BT, Display, Camera, Button and Micro-USB,etc.

### 4.1 POWER IN

The device only supports power input with USB Type-C. Support OTG function,conform USB2.0 standard,support 5V2A power input.



### 4.2 WIFI/BT

VT-HMI04-RK3326S use independent module AIC8800D80 that support Wi-Fi6 and BT5.4. Support SDIO,UART and PCM interface. The integrated module provides SDIO interface for Wi-Fi and UART interface for Bluetooth.

### 4.3 Display

VT-HMI04-RK3326S has 1 4" screen YX40005BCT2 and 1 MIPI DSI interface. The LCD drive voltage is 3.3V,the LED drive current is 40mA and operating voltage is 16V. The screen number of pixel is 720x720. ST7703 is used as the LCD drive IC. MIPI DSI with 4 data lane and 1 clock lane. More parameters are shown in the table.

Table 4-3-1 List of signals

|  | PIN NUMBER | SIGNAL NAME | LEVEL |
|--|------------|-------------|-------|
|--|------------|-------------|-------|

|          |        |               |      |
|----------|--------|---------------|------|
| MIPI DSI | PIN 1  | TP_IOVCC      | 1.8V |
|          | PIN 2  | TP_VCI        | 3.3V |
|          | PIN 3  | GPIO_CTP_RSTB | 1.8V |
|          | PIN 4  | SCL0          | 1.8V |
|          | PIN 5  | SDA0          | 1.8V |
|          | PIN 6  | EINT_CTP      | 1.8V |
|          | PIN 7  | GND           |      |
|          | PIN 8  | DSIO_D3N      |      |
|          | PIN 9  | DSIO_D3P      |      |
|          | PIN 10 | GND           |      |
|          | PIN 11 | DSIO_D2N      |      |
|          | PIN 12 | DSIO_D2P      |      |
|          | PIN 13 | GND           |      |
|          | PIN 14 | DSIO_CKN      |      |
|          | PIN 15 | DSIO_CKP      |      |
|          | PIN 16 | GND           |      |
|          | PIN 17 | DSIO_D1N      |      |
|          | PIN 18 | DSIO_D1P      |      |
|          | PIN 19 | GND           |      |
|          | PIN 20 | DSIO_D0N      |      |
|          | PIN 21 | DSIO_D0P      |      |
|          | PIN 22 | GND           |      |
|          | PIN 23 | PWM           |      |
|          | PIN 24 | TE            |      |
|          | PIN 25 | LCM_RST       | 1.8V |
|          | PIN 26 | IO_VCC        | 1.8V |
|          | PIN 27 | VCI           | 3.3V |
|          | PIN 28 | LCM_LEDK      |      |
|          | PIN 29 | LCM_LEDK      |      |
|          | PIN 30 | LCM_LEDA      |      |

#### 4.4TP

VT-HMI04-RK3326S support TP and LCD on the same connector,includes interrupt and reset signals,is driven by I2C0.

#### 4.5Camera

VT-HMI04-RK3326S includes a MIPI interface,4 data lane and 1 clock lane,uses a front 5MP camera OV5648P, supports autofocus and scan Bar/QR Code.

Table 4-5-1 List of signals

|          | PIN NUMBER | SIGNAL NAME | LEVEL |
|----------|------------|-------------|-------|
| MIPI CSI | PIN 1      | GND         |       |

|  |        |              |      |
|--|--------|--------------|------|
|  | PIN 2  | CAM0_D3N     |      |
|  | PIN 3  | CAM0_D3P     |      |
|  | PIN 4  | GND          |      |
|  | PIN 5  | CAM0_D2N     |      |
|  | PIN 6  | CAM0_D2P     |      |
|  | PIN 7  | GND          |      |
|  | PIN 8  | CAM0_D1N     |      |
|  | PIN 9  | CAM0_D1P     |      |
|  | PIN 10 | GND          |      |
|  | PIN 11 | CAM0_D0N     |      |
|  | PIN 12 | CAM0_D0P     |      |
|  | PIN 13 | GND          |      |
|  | PIN 14 | CAM0_CLKN    |      |
|  | PIN 15 | CAM0_CLKP    |      |
|  | PIN 16 | GND          |      |
|  | PIN 17 | CAM_SCL      | 1.8V |
|  | PIN 18 | CAM_SDA      | 1.8V |
|  | PIN 19 | MIPI_CAM_RST | 1.8V |
|  | PIN 20 | MIPI_CAM_PDN | 1.8V |
|  | PIN 21 | GND          |      |
|  | PIN 22 | CIF_CLK      | 1.8V |
|  | PIN 23 | GND          |      |
|  | PIN 24 | NC           |      |
|  | PIN 25 | VCAMIO_PMU   | 1.8V |
|  | PIN 26 | VCAMIO_PMU   | 1.8V |
|  | PIN 27 | VCAMD_PMU    | 1.8V |
|  | PIN 28 | VCAM_AF_PMU  | 2.8V |
|  | PIN 29 | VCAMA_PMU    | 2.8V |
|  | PIN 30 | NC           |      |
|  | PIN 31 | GND          |      |

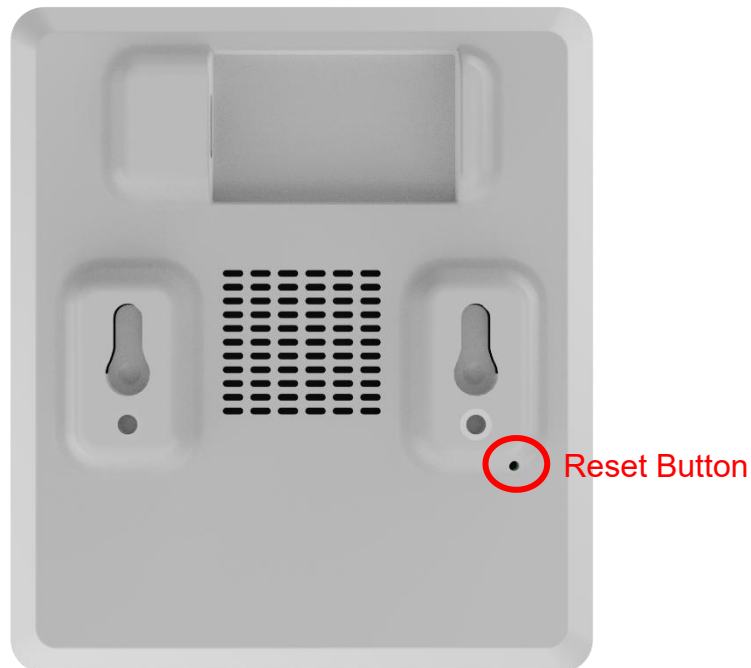
## 4.6 Button

VT-HMI04-RK3326S has 4 buttons. Power button, RESET button and Volume +/- button, and a reset button hole is reserved on the back cover of the machine for convenient operation..

Table 4-8-1 List of signals

| Function | Description         |
|----------|---------------------|
| Volume + | Volume up button    |
| Volume - | Volume down button  |
| RESET    | System reset button |

|       |                        |
|-------|------------------------|
| POWER | Powerkey on/off button |
|-------|------------------------|



#### 4.7 USB2.0

VT-HMI04-RK3326S has one USB Type-C port , support charging and USB 2.0 OTG function.  
Standard input power supply 5V2A.

- If use the Type-C port for debugging work, please use a hub with power supply to avoid insufficient driving current and the system will be reset due to power failure.

#### 4.8 I2C

CPU has a total of 3 I2C interfaces , I2C0 drives PMIC and TP,I2C1 drives EEPROM,NFC and CC chip,I2C2 drives Camera separately.

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## 5. Hardware Operation Note

This chapter provides a guide to set up and use some of the features of the tablet. For more details, see hardware description.

### 5.1 Power Preparation

#### 5.1.1 Environment

Before the equipment is powered on, please confirm whether the environmental conditions meet the requirements. Environmental conditions are as follows:

- Operation temperature: 0°C ~ +45°C

#### 5.1.2 Power Input

Please confirm the power input is 5V and the reference current is 2A.



Do not use unauthorized or incompatible power adapters to charge the device, otherwise fire, explosion or other dangers may be caused.

---

## 6. FCC-IC-CE WARNING

### 6.1 FCC

#### **FCC compliance statement**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### **Exposure to radio frequency energy:**

The radiated output power of this device meets the limits of FCC radio frequency exposure limits. This device should be operated with a minimum separation distance of 20 cm between the equipment and a person's body.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### 6.2 ISED

---

**ISED Canada compliance statement:**

This device complies with ISED Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

**Exposure to radio frequency energy:**

The radiated output power of this device meets the limits of ISED Canada radio frequency exposure limits. This device should be operated with a minimum separation distance of 20 cm between the equipment and a person's body.

*Le présent appareil est conforme aux CNR d'ISDE Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :*

- (1) l'appareil ne doit pas produire de brouillage, et*
- (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

*La bande 5150–5250 MHz est réservée uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.*

*L'exposition à l'énergie radiofréquence.*

*La puissance de sortie rayonné de cet appareil est conforme aux limites de la ISDE Canada limites d'exposition aux fréquences radio. Cet appareil doit être utilisé avec une distance minimale de séparation de 20 cm entre l'appareil et le corps d'une personne.*

**6.3CE****6.3.1Mandatory Requirement**

- 1. Operation temperature range: 0°C~ 40°C
- 2. This product can be used across EU member states
- 3. The device complies with RF exposure requirement when the device used at 20cm from your body
- 4. DOC as follow:

---

## **7. Software Instructions**

VT-HMI04-RK3326S has a pre-loaded firmware. For more information, please refer to software user manual for software operation.

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## 8. Tips



### Waste Disposal

It is recommended to disassemble the device before abandoning it in conformity with local regulations. Please ensure that the abandoned batteries are disposed according to local regulations on waste disposal. Do not throw batteries into fire (explosive) or put in common waste canister. Products or product packages with the sign of “explosive” should not be disposed like household waste but delivered to specialized electrical & electronic waste recycling/disposal center. Proper disposal of this sort of waste helps avoiding harm and adverse effect upon surroundings and people’s health. Please contact local organizations or recycling/disposal center for more recycling/disposal methods of related products.

Comply with the following safety tips:



Do not use in combustible and explosive environment

Keep away from combustible and explosive environment for fear of danger.



Keep away from all energized circuits.

Operators should not remove enclosure from the device. Only the group or person with factory certification is permitted to open the enclosure to adjust and replace the structure and components of the device. Do not change components unless the power cord is removed. In some cases, the device may still have residual voltage even if the power cord is removed. Therefore, it is a must to remove and fully discharge the device before contact so as to avoid injury.



Unauthorized changes to this product or its components are prohibited.

In the aim of avoiding accidents as far as possible, it is not allowed to replace the system or change components unless with permission and certification. Please contact the technical department of Vantron or local branches for help.



Pay attention to caution signs.

Caution signs in this manual remind of possible danger. Please comply with relevant safety tips below each sign. Meanwhile, you should strictly conform to all safety tips for operation environment.



#### Notice

Considering that reasonable efforts have been made to assure accuracy of this manual, Vantron assumes no responsibility of possible missing contents and information, errors in contents, citations, examples, and source programs.

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## 9. Appendix A: How to Contact Us

If you have any problem or want to know more about our products, please visit [www.vantrontech.com](http://www.vantrontech.com) or contact us.

### **US Office: Vantron Technology, Inc.**

Address: 48434 Milmont Ave., Fremont,

CA 94538-7324

Tel: 925-621-8758

Email: [sales@vantrontech.com](mailto:sales@vantrontech.com)

### **China Office: Vantron Technology, Ltd**

Address: 6th Floor, 1st Building, No.9, 3rd Wu Ke East Street,

Wu Hou District, Chengdu 610045, China

Tel: 86-28-8512-3930/3931, 8515-7572/6320

Email: [sales@vantrontech.com.cn](mailto:sales@vantrontech.com.cn)