

**VT-PNL156-MT65-HD**  
**Hardware User Manual**

**Product Version: 1.1**

**Date: 2021-12-02**



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## Change History

This table describes the version and release date.

Rev.	Date	Description	Author
1.0	2021-06-15	First release.	Cong Yang
1.1	2021-12-02	Update relevant information	Cong Yang

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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.

### Limitation of Liability/Non-warranty

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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 60°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.
- ◆ Ensure ventilation of the ventilation slot.
- ◆ 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**

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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 device is damaged.
    - The temperature is excessively high.
    - 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, Freescale iMX6, iMX8, 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 in human resources, and on-time delivery will guarantee the success in your project development.

Based on idea of “Application Ready” products and services, our embedded computers have embedded basic operation system which includes the drivers of its 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

These tables respectively describe the valid signal of connectors on the Vantron board.

Table 1-1 Term description (1)

N/C	Not connect
GND	Ground
/	Active low signal
+	Positive of difference signal
-	negative of difference signal

Table 1-2 Term description (2)

I	Input
O	Output
I/O	input/output
P	Power or ground
A	Analog
OD	Open drain
CMOS	3.3 V CMOS
LVC MOS	Low Voltage CMOS
LV TTL	Low Voltage TTL
3.3V	3.3 V signal level
5V	5 V signal level
USB	5 V tolerant signal
PCIe	PCI Express signal, not 3.3 V tolerant
NC	No Connection

## 2 Overview

### 2.1 Introduction

VT-PNL156-MT65-HD is a tablet packed with MT8365 processor, USB2.0, built-in 2GB LPDDR4 dual channel memory, 32GB eMMC 5.1 flash memory and Wi-Fi/BT.

### 2.2 Specifications

Table 2-1 Specifications

Specifications		
SOC	Processor	MTK MT8365(I350). CPU: Quad-Core ARM Cortex-A53 2.0GHz(Max), 12nm GPU: Mali-G52. 3D graphic accelerator capable of processing 57.6 GFLOPS and 1600M pixel/s, 800MHz.
Memory	RAM	2GB LPDDR4-3733
	Flash	32GB eMMC 5.1
	EEPROM	2Kb
Display	LCD	15.6" TFT LCD
	Resolution	1920 x 1080
	Contrast Ratio	700:1
	LCM Luminance	220 cd/m2(Typ.)
	View Angle	Full View
	Touch Screen	Cap-touch, support 10-point multi-touch.
Interfaces	Ethernet	1 x 10M/100Mbps Ethernet, RJ45 connector with LEDx2
	USB	1 x Micro USB, standard USB 2.0; supports OTG
		1 x USB TYPE-C, standard USB 2.0; Only support the host mode.
	Button	1 x Volume+; 1 x Volume-
Wireless	WIFI&BT	802.11b/g/n/ac, 2.4G/5GHz, BT5 (support A2DP (Advance Audio Distribution Profile), HFP (Hands Free Protocol) and HDP (Health Device Profile)), 2 ANT5 (BT&Wi-Fi shared ant)
	ANT+	2.4-GHz Radio support RSSI
Audio	Speaker	Support 2x3W/8Ω speaker.



RTC	RTC	Support
Software	OS	Android 10
Power	DC Input	Support 12V/1A DC power supply.
Design	Dimensions	415.76 x 301.2 x 38.1mm
	Tablet Weight	About 2780g
Environment Condition	Temperature	Operating: 0 ~ 60℃ (Recommended: 25℃) storage: -20 ~ +60℃ (Recommended: 25℃)
	Humidity	5-95%RH (Non-Condensation)

## 2.3 Order Information

Table 2-2 Order information

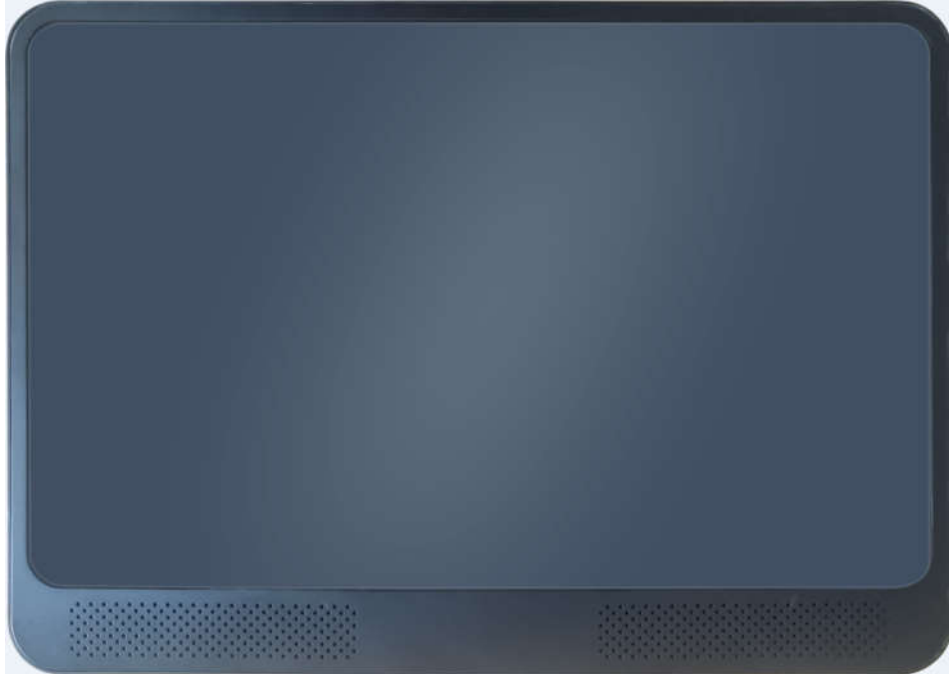
Part Order Example	
VT-PNL156-MT65-HD	MT8365 ARM Quad-Core , Cortex-A53 2.0GHz(Max) Wi-Fi 802.11 a/b/g/n/ac, BT 5.0.

Note: Please contact Vantron for other order information.

## **3 Hardware Instructions**

### **3.1 Appearance**

Figure 3-1 Views



## 3.2 Interface Description

Figure 3-2 Interfaces (1)

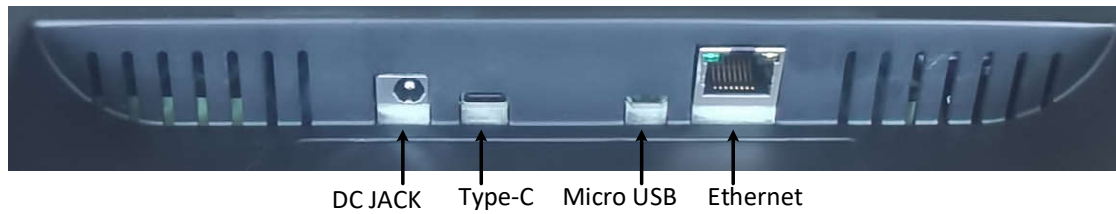
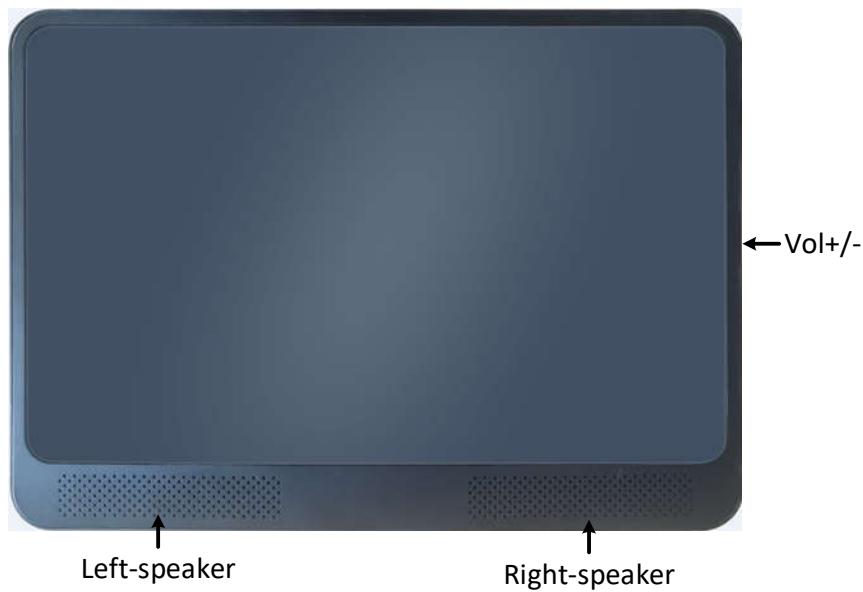


Figure 3-3 Interfaces (2)



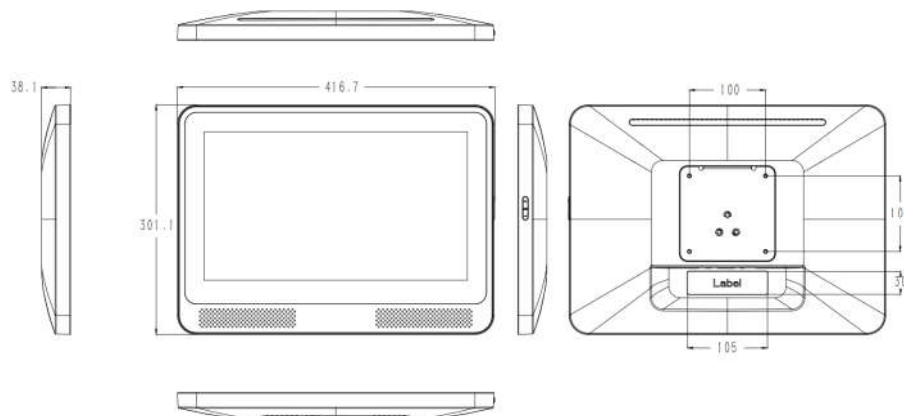
## 3.3 Structure

Download the board structure document from Vantron official website:

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

Figure 3-4 Structure

Unit: mm



## 4 Hardware Function Description

This chapter mainly describes the main hardware functions of this product, including ANT+, WIFI/BT, audio, display and USB.

### 4.1 ANT+ Module

ANT+ module shall support ANT+ communication at least 1 channel, and RSSI (Received Signal Strength Indicator).

### 4.2 Wi-Fi/BT

The wireless module inside the tablet complies with IEEE 802.11 a/b/g/n/ac standard. The integrated module provides SDIO interface for Wi-Fi and Bluetooth.

### 4.3 Audio

VT-PNL156-MT65-HD has two 3W Speakers.

### 4.4 Display

VT-PNL156-MT65-HD has a 15.6" screen. The screen is made up of a display screen and a touch screen, which are fitted together by full-fit technology. More parameters are shown in the table.

Table 4-1 Display parameters

Item	Specifications	Unit
Screen Size	15.6"	Inch
Viewing direction	Full View	-
Resolution	1920 x 1080	-
Display Mode	Normally Black	-
Number of Colors	16,194,277	colors
LCM Luminance	220 (Typ.)	cd/m2
Contrast Ratio	700:1	-
Interface	EDP	-
Touch Screen	Cap-touch, 10-point	

## **4.5 Ethernet**

VT-PNL156-MT65-HD has a network port that supports 10M/100Mbps Ethernet. The network port hosts two indicators. The green light is a 100M port indicator: 100M Link and Active (Transmitting or Receiving); while the yellow light is a 10M port indicator: 10M Link and Active (Transmitting or Receiving). (The yellow light needs to be used in a specific LED mode and is not used by default.)

## **4.6 USB**

VT-PNL156-MT65-HD has two USB ports (Type-C and Micro USB ports), both of which support standard USB2.0. Type-C only supports host mode; While Micro USB supports master-slave mode. Type-C supports a maximum of 5V/0.5A output; while Micro USB supports a maximum of 5V/1A output.

## 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 Preparation

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

- Operation Temperature: 0°C ~ +60°C
- Operation Humidity: 5-95%RH (Non-Condensation)

#### 5.1.2 DC Power Input

Please confirm the power input is 12V, and the reference current is 1A.

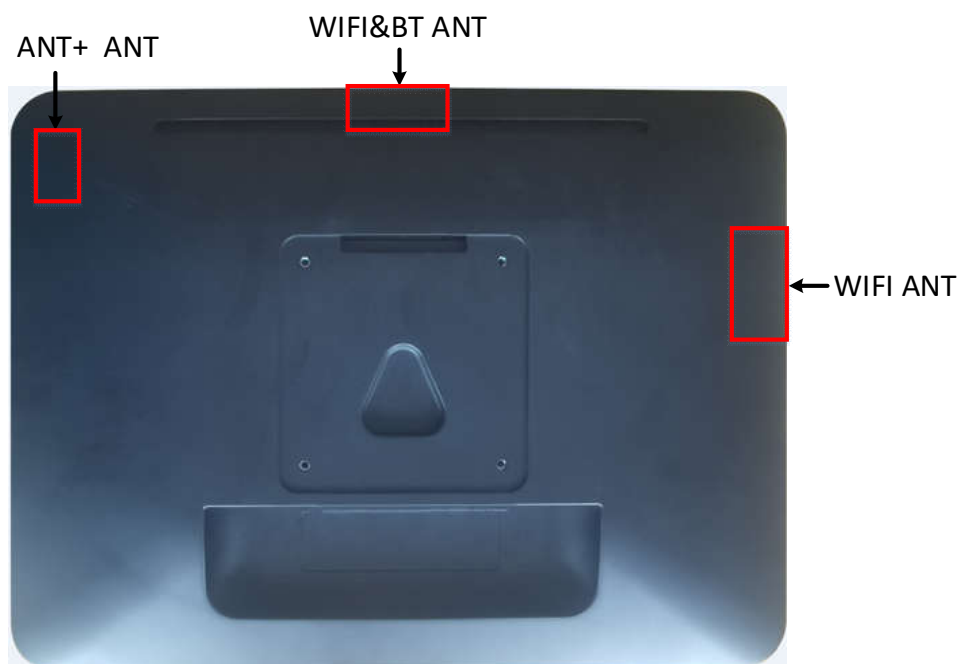


Do not use unauthorized or incompatible power adaptors to charge the device. Otherwise fire, explosion or other incidents may be caused.

### 5.2 Antenna

The design of the internal antenna of VT-PNL156-MT65-HD is shown in Figure 5-1.

Figure 5-1 Internal antenna



In order to ensure that the tablet functions can work properly, please do not cover the antenna area with metal shielding devices.

## **6 Software Instructions**

VT-PNL156-MT65-HD has been pre-loaded firmware. For more information, please refer to software user manual for software operation.



## 7 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

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## Appendix A: How to Contact Us

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

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

Address: 440 Boulder Court, Suite 300,

Pleasanton, CA 94566, USA

Tel: 925-621-8758

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

### **China Office: Chengdu 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)

## **FCC 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.

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 important announcement

## **Radiation Exposure Statement**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

## **ISED Statement**

This device complies with contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS standard(s).

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.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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.

### **Radiation Exposure Statement**

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

### **Déclaration d'exposition aux radiations**

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

The device for 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;

les dispositifs fonctionnant dans la bande de 5150 à 5250MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;