

VT-M2M-APL PLUS User's Manual



Chengdu Vantron Technology Ltd. Co.
www.vantrontech.com

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Part I: Hardware Platform

1 Foreword

1.1 Copyright Notice

While all information contained herein have been carefully checked to assure its accuracy in technical details and printing, Vantron assumes no responsibility resulting from any error or features of this manual, or from improper uses of this manual or the software. Please contact our technical department for relevant operation solutions if there is any problem that cannot be solved according to this manual.

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Vantron Technology (Vantron)



E-mail: sales@vantrontech.com

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1.2 Notes

Applicable notes are listed in the following table:

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

1.3 Statement

It is recommended to read and comply with this manual before operating VT-M2M-APL PLUS which provides important guidance and helps decreasing the danger of injury, electric shock, fire, or any damage to the device.

1.4 Disclaimer

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

1.5 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 VT-M2M-APL PLUS should be installed, debugged and maintained by professional people.

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

Unit shall be used with indoor-use antenna only. No antenna for this

unit can be installed outdoor.

1.6 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.

1.7 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.
 - Keep the ventilation slot ventilated for cooling.
 - 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 standard.

1.8 Safety Instructions for Power Cables and Accessories



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.



1.9 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 the operation according to the manual.

2 Overview

2.1 Introduction

Thank you for choosing Vantron. It is our commitment to provide our valued customers with the embedded devices equipped with the state-of-the-art technology and the best product services.

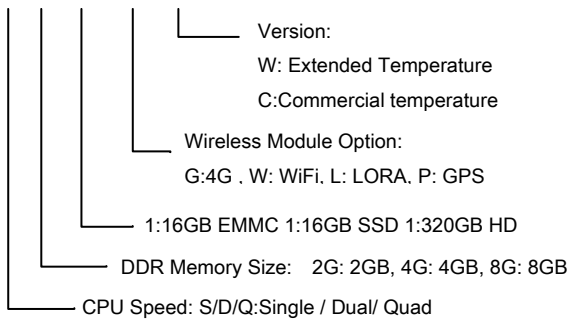
Vantron's M2M products are based on the most advanced ARM、Intel Atom and Intel APL processors and have low-power consumption and high integration. The products are designed for applications of M2M in industrials, medicals, financial, retail, vehicle, and transportations etc.

2.2 Product Series

2.2.1 Product Order Coding Rule

Order Code

VT-M2M-APL-D-4G-111-GWLP-C



2.2.2 Ordering Information

Order Examples:

VT-M2M-APL-D-4G-111-GWLP-C

ATOM APL Dual core Processor, 4GB LPDDR4, 16GB/16GB/320GB,
4G, WiFi, LORA,GPS, Commercial temperature

Accessories:

Install Mechanical tools,1pc
Power Adapter with locked connector (Optional),1pc
4G Antenna(Optional),2pc
WiFi &BT Antenna(Optional),2pc
LORA Antenna(Optional),1pc
GPS Antenna(Optional),1pc

3 M2M-APL Hardware Instructions

3.1 Product Appearance



Front Side View



Overlook Side View



View for all optional embedded modules and antennas

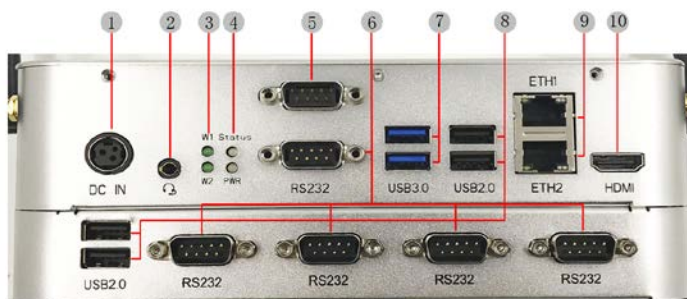
3.2 Specifications

Specifications		
CPU	Processor	Intel® APL,N3350/2.4GHz , Dual core Processor,6W (optional N3450/2.2GHz Quad core; N4200/2.4GHz Quad core)
	On Board RAM	On Board LPDDR4 1600MT/s 4GB(optional 8GB)
Memory	ROM Internal	16GB EMMC(optional up to 64GB) 16GB SSD(optional up to 2TB) 320GB Hard Disk(optional up to 2TB)
	Resolution	HDMI 1.4b (3840x2160@30Hz ⁵)
Display	Interface	1xHDMI(Standard)
	WLAN	802.11 b/g/n Wireless Module, external antenna
Wireless Communication	BT	Bluetooth 4.0 module, with external antenna
	Cellular Module	1xMINIPCIE 4G Cellular Module with SIM slot(optional 1x M.2 B-KEY 5G Module)
	RF Module	With LORA RF module With GPS module
	Ethernet	2x10/100/1000-BaseT(RJ45)
Peripheral Interfaces	USB	4xUSB2.0 Host (Type A) 2xUSB3.0 Host (Type A)

	Audio	1xHeadphone with Mic 3.5mm
	COM Port	1xRS232/422/485 (Full function, DB9) 5xRS232 ((Full function, DB9)
	LED	4xIndicate LED
	Alarm	Buzzer Out
	RTC	Supported
	Control	Reset Button
Security	security	TPM module on board
Software	OS	Linux, Windows 10
	Applications	SDK Available
Power	Input	DC12 / 24V(12-36V), Locked Power Jack
	Consumption	10W+
Mechanical	Dimensions	220x155x79mm (Box)
	Install	220x168x79mm
	Weight	1.3Kg
	Enclosure	Aluminum Alloy with Silver Color
Environment Condition	Temperature	Operating: -20°C ~ +60°C,
		Storage:-40°C ~ +85°C
	Humidity	5-95%RH at 25-35 (Non-Condensation)
	Cooling Mode	Fan less, Heat Sink
	Approvals	UL, FCC, IC, CE, RoHS, and PTCRB Compliance

3.3 Interface Instructions

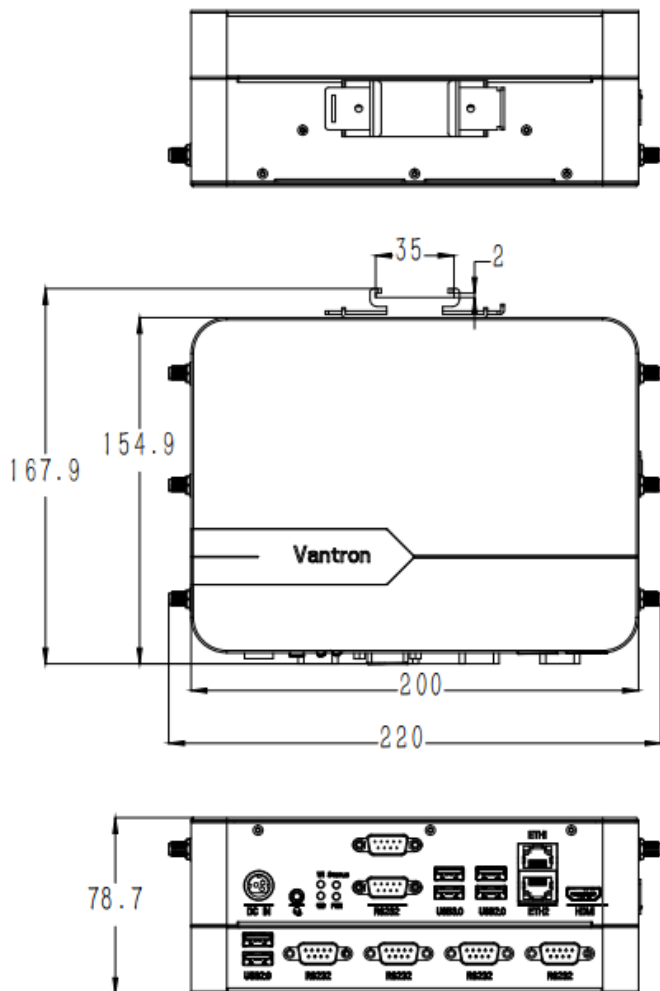
3.3.1 Front View



3.3.2 Overlook View



3.4 Dimension



3.5 Interface Description

Connectors and Antennas			
1	DC Power Input 12~36V	2	Headphone with Mic
3	Wireless Indicate LED	4	SATA and Power Indicate LED
5	RS232/RS485/RS422	6	RS232 Connector
7	USB3.0 Connector	8	USB2.0 Connector
9	ETH Connector	10	HDMI Connector
RF1	WWAN Primary Antenna	RF2	WIFI Antenna
RF3	GPS Antenna	RF4	LORA Antenna
RF5	WWAN Secondary Antenna	RF6	BT Antenna
VESA	VESA fixed support		

3.5.1 Power JACK with lock



Location	Pin	Definition	Pin	Definition
①	1,3	GND (ground pin)	2	Power (+12~36V)

3.5.2 RS232/RS485/RS422 Connector



Location	Pin	Definition	Pin	Definition
5	1	DCD1/422TX+/485_A	2	RXD1/422TX-/485_B
	3	TXD1/422RX+	4	DTR1/422RX-
	5	DGND (ground pin)	6	DSR1
	7	RTS1	8	CTS1
	9	RI1		

The Connector can be defined to RS232、RS485 or RS422 by BIOS set.

3.5.3 D Sub-9 RS232 Connector



Location	Pin	Definition	Pin	Definition
6	1	DCD	2	RXD
	3	TXD	4	DTR
	5	GND	6	DSR
	7	RTS	8	CTS
	9	RI		

3.5.4 Antenna description

4G Antenna

Location :  



Electrical Properties	
Frequency	700-2700MHz
Impedence	50 Ohm Nominal
V.S.W.R	1.8:1 Max
Return Loss	-10 dB Max
Radiation	Omni-directional
Gain(Peak)	5.0 dBi
Cable Loss	2.3dB/m Max@2450Mhz
Polarization	Linear,Vertical
Adimitted Power	1W
Connector	SMA Male
Physical Properties	
Antenna Material	TPE/PC/Cu/POM
Cable Type	RG-178
Operating Temp.	-40°C ~ +85°C
Storage Temp.	-40°C ~ +85°C
Cable Color	Black

WLAN&BT Antenna

Location : RF2 RF6



Electrical Properties	
Frequency	2.4GHz
Impedance	50 Ohm Nominal
V.S.W.R	1.92 : 1 Max
Return Loss	-10 dB Max
Radiation	Omni-directional
Gain (Peak)	3.0 dBi
Cable Loss	2.3 dB / m Max @ 2450 MHz
Polarization	Linear, Vertical
Admitted Power	1 W
Connector	SMA Male
Physical Properties	
Antenna Material	TPE / PC / Cu / POM
Cable Type	RG-178
Operating Temp.	-10 ~ +60 °C
Storage Temp.	-10 ~ +70 °C
Cable Color	Black

LORA Antenna Location : RF4

GPS Antenna Location : RF3

3.6 Operation Notice

3.6.1 Change SIM Card

Remove the shield, push the SIM Card into the Slot, install the shield.

3.6.2 Power Supply

Please make sure using adapter in the accessory, or the power is not reversed when powered by other adapter.

3.6.3 VESA Install

Install the Device to the VESA fixed support, it can be installed to guide rails.

4 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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FCC Warning

This device complies with FCC class B Rules. Operation is subject to the Following conditions.

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

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.
- Consult the dealer or an experienced radio/TV technician for help.

Any modification to the product is not permitted unless authorized by Vantron. It's not allowed to disassemble the product, it is not allowed to replace the system or change components unless with permission and certification. Please contact the technical support department of Vantron or local branches for help.



IC statement

Disclaimer:

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.

Warning! This class B digital apparatus complies with Canadian ICES-003.

Industry Canada ICES-003 Compliance Label:

CAN ICES-3 (B)/NMB-3(B)



RF exposure warning

This equipment must be installed and operated in accordance with provide instructions and the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operation in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

Vantron

US Office: Vantron Technology, Inc.

Address: 440 Boulder Court, Suite 300,

Pleasanton, CA 94566

Tel: +1 916-202-7042

Email: sales@vantrontech.com

China Office: Chengdu Vantron Technology, Ltd

Address: 6th Floor, 1st Building, No.9, 3rd WuKe East Street, WuHou District, Chengdu, P.R. China
610045

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

Email: sales@vantrontech.com.cn