

# VT-M2M-LV User's Manual



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## Revision History:

No.	Version	Description	Date
1	V1.0	First release	Nov.8, 2012
2	V2.0	Upgrade PCB to Revision 2	Oct.18, 2013
3	V3.0	Upgrade PCB to Revision 3, move GPS to on board, change WiFi to on board module.	Sept.28, 2014
4	V3.1	Add FCC and IC warning statement	March.16,2015

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# 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 reserves the right of all publicly-released copies of this manual.

## 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 LV 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-LV 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.

## 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.



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**

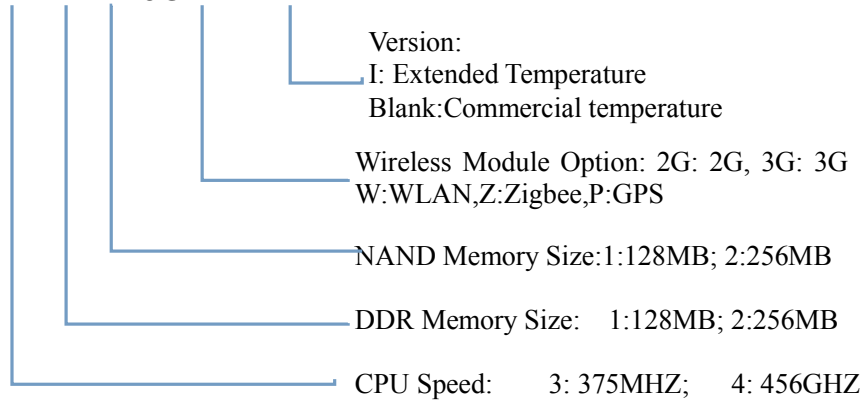
Thank you for choosing Vantron. It is our commitment to provide our valued customers with the embedded devices equipped with the state-of-the-art technology and the best product services.

Vantron's M2M products are based on the most advanced ARM and Intel Atom 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

### Order Code

VT-M2M-LV-4-1M-1F-3GWZP-I



### Order Examples:

<b>VT-M2M-LV-4-1M-1F</b>	456Mhz ARM9 Processor, 128MB DDR2, 128MB NAND
<b>VT-M2M-LV-3-1M-1F-W</b>	375Mhz ARM9 Processor, 128MB DDR2, 128MB NAND, WLAN
<b>VT-M2M-LV-3-1M-2F-3GW</b>	375Mhz ARM9 Processor, 128MB DDR2, 256MB NAND 3G module, WLAN

### Accessories:

<b>Install Mechanical tools,1pc</b>
<b>Power Adapter (Optional),1pc</b>
<b>IO Terminal (12x3.81mm) (Optional),1pc</b>
<b>Power Terminal (3x3.81mm) (Optional),1pc</b>
<b>3G Antenna(Optional),1pc</b>
<b>WiFi Antenna(Optional),1pc</b>
<b>GPS Antenna(Optional),1pc</b>



### 3. M2M-LV Hardware Instructions

#### 3.1 Product Appearance



Front Side View



Back Side View

### 3.2 Specifications

Specifications		
<b>CPU</b>	Processor	ARM9 processor
<b>Memory</b>	On Board RAM	DDR2 128MB(64Meg x 16)
	ROM Internal	NAND 128MB (256MB or others)
<b>Wireless Communication</b>	WLAN	Optional 1X802.11/ b/g/n Wireless Module external antenna
	3G/GPRS Module	Optional 1x mini PCIE 3G Broad Band Module with SIM slot or GPRS module
	GPS	Optional 1X GPS module, external antenna
	Zigbee	Optional, or RF 2.4G
<b>Peripheral Interfaces</b>	Ethernet	1x10/100M-BaseT(RJ45)
	COM Port	1xDB9 RS232/485 1xRS232/485/422 1xCAN 2.0b up to 1Mbit/s
	Alarm	Buzzer Out
	SD card	1xSD card Slot (Optional )
	RTC	Supported
	GPIO	Reserved GPIO X4(Terminal)
<b>Security</b>	Security(Optional)	On board Registration Serial Number, and SHA-1 Encrypt/Decrypt Chip DS28E01
<b>Power</b>	Input	DC6-36V(default 12V), Locked Power Jack
	Consumption	TBD
<b>Environment Condition</b>	Temperature	Operating:-20°C ~ +70°C ( ETR:-40°C ~ +80°C Optional)
		Storage: -40°C ~ +85°C,
	Humidity	5-95%RH at 25-35 (Non-Condensation)
	Cooling Mode	Fan less, Heat Sink
Approvals	UL, FCC Class B, and CE	

### 3.3 Interface Instructions



Front Side View

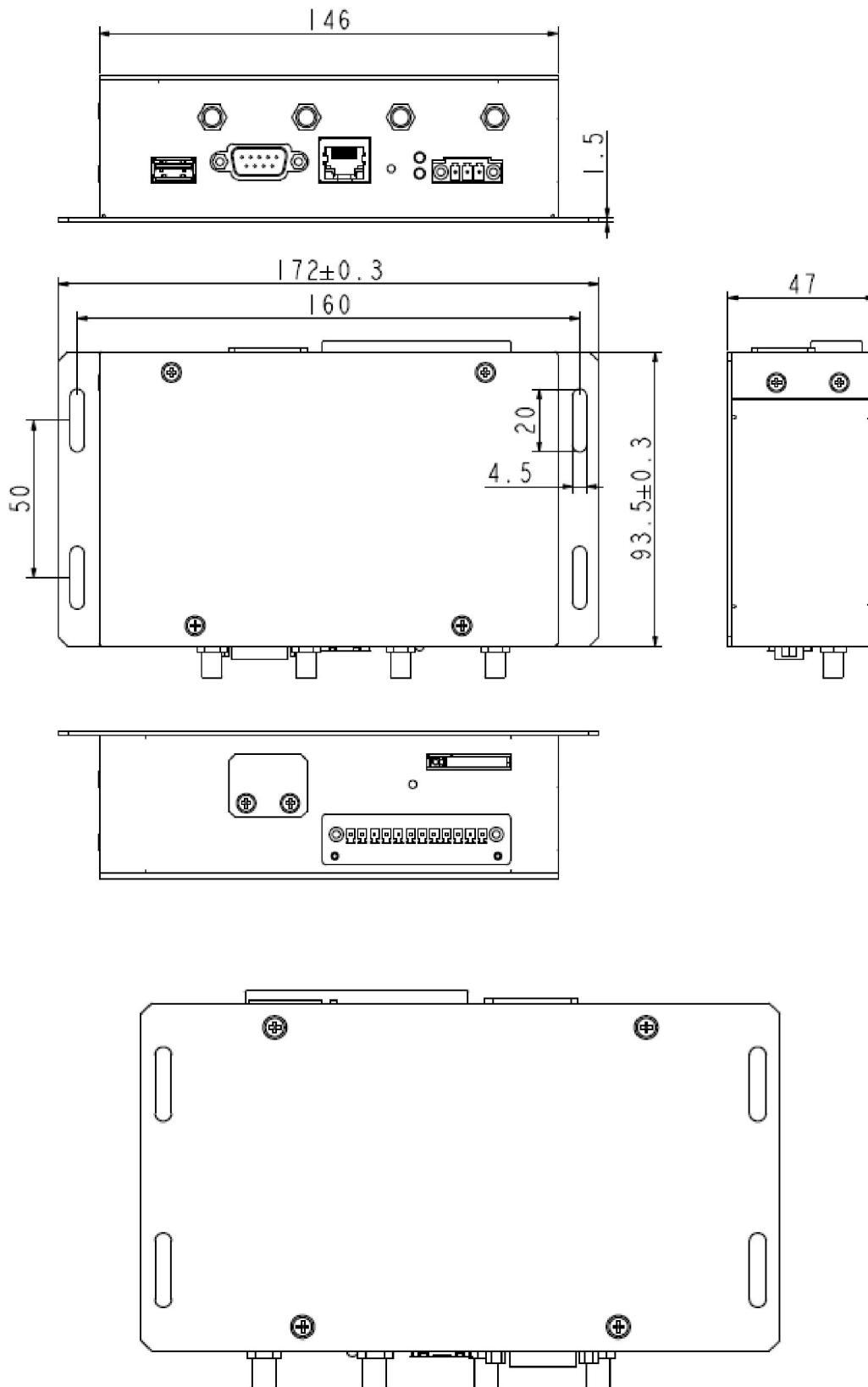


Back Side View



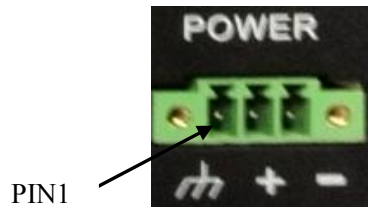
Left Side View

### 3.4 Dimension



### 3.5 Interface Description

#### 3.5.1 Power Interface

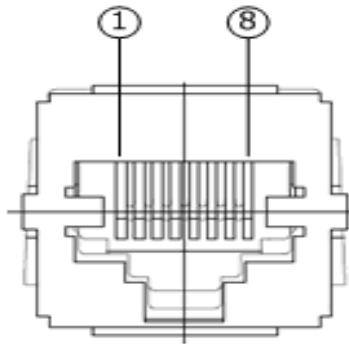


**Power connector outlook**

Pin	Description
1	Shell ground
2	Power input range 6-36V
3	Ground

### 3.5.2 Ethernet Interface

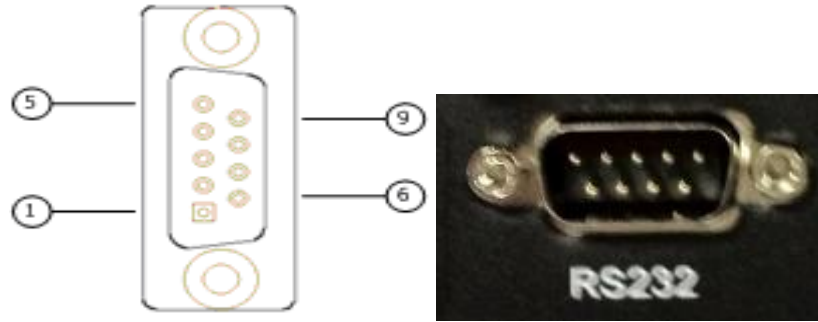
Standard RJ45 interface, supporting 10M/100M self-adaptation, this is a standard RJ45 Ethernet port



Pin	Description	Remarks
1	TXP	IO
2	TXN	IO
3	RXP	IO
4	CT	P
5	CT	
6	RXN	IO
7	NC	
8	MH_GND	P
9	LEDG+	P
10	LINKLED	
11	LEDY-	P
12	ACTIVITYLED	

### 3.5.3 D Sub-9 RS232 or RS485 Connector

Standard vertical DB-9 male connector.



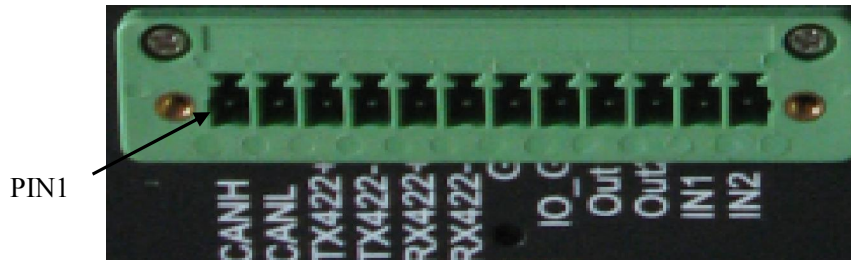
Pin	Description	Remarks
1	NC or RS485_A	
2	RXD2 or RS485_B	I
3	TXD2	O
4	NC	
5	DGND	P
6	NC	
7	NC	
8	NC	
9	NC	

### 3.5.4 RS232/422/485,CAN,ExternalIO Connector

12pins 3.81 pitch terminal with screw lock

Load capacity: more than 128 nodes/RS485 channel-- **bit rate: 115200**

**CAN: The bit rate can be programmed to a maximum of 1Mbit/s**



Pin	Description	Remarks
1	CANH	
2	CANL	
3	TX422+	
4	TX422-	
5	RX422+/RS485_2_A/STXD3	Jumper Set
6	RX422-/ RS485_2_B/SRXD3	Jumper Set
7	DGND	P
8	IO_GND	P
9	GPIO_OUT1	IO
10	GPIO_OUT2	IO
11	GPIO_IN1	IO
12	GPIO_IN2	IO



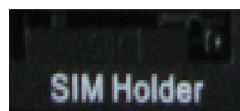
### 3.5.5 LED



PWR LED: light indicates system power OK (main power up); off indicates system power turn off  
 Status LED: User can define by themselves.

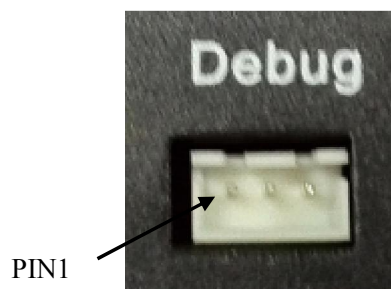
### 3.5.6 SIM Card

Push the small button on the left of SIM Card Holder, and install the SIM card to the holder. Then push the holder into the Slot.



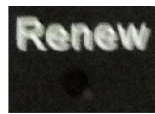
### 3.5.7 DEBUG

CONN, BOX, 1x3x2.0, TH, JST, VERT (JST: B3B-PH-K-S(LF)(SN)), User can show the debug message and use keyboard input debug command.



Pin	Description
1	DGND
2	SUART2_RXD
3	SUART2_TXD

### **3.5.8 Renew button**



Renew button:long press this button will restore the factory setting, the long press time can be setting by user

### **3.5.9 Reset button**



Reset button:short press this button will resetthis M2M device.

### **3.5.10 SD/MMC socket**



This is standard SD card socket , user can save data on this storage. You can remove this metal cover by use screw-driver tool.

## 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. Vantron reserves the right to make necessary changes to this manual without prior notice. No part of this manual may be reprinted or publicly released in for



### 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.
- 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.

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

This device complies with Industry Canada licence-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.

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

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



### 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.



### Product Name: M2M Gateway, Model: VT-M2M-LV

FCC ID: 2AAGEVTM2M-LV, IC:1152A-VTM2MLV, contains FCC ID:RI7HE910, IC:5131A-HE910  
FCC ID: 2AAGEVTM2M-LV, IC:1152A-VTM2MLV, contains FCC ID:RI7DE910-DUAL, IC:5131A-DE910DUAL  
FCC ID: 2AAGEVTM2M-LV, IC:1152A-VTM2MLV, contains FCC ID: RI7GE910Q3, IC: 5131A-GE910Q3

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