

2 Port RFID Fixed Reader

- RS200 (PC Based) -



User's Manual

Version 1.5

Change Log

Date	Change Description	Version
20190729	first published version	1.0
20190912	Updated information	1.1
20191015	Add 2.1.5	1.2
20191125	Update 2.1.4	1.3
20200120	Update 2.1.2	1.4
20210906	Update 2.1.4 Antenna Testing Scenario	1.5

Preface

About This Manual

Thank you for purchasing the unitech product.

This manual explains how to install, operate and maintain our product.

No part of this publication may be reproduced or used in any form, or by any electrical or mechanical means, such as photocopying, recording, or information storage and retrieval systems, without permission in writing from the manufacturer. The material in this manual is subject to change without notice.

Regulatory Compliance Statements



FCC Warning Statement

This device 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 with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with 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:

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- 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.
1. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
 2. This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. To maintain compliance with FCC RF exposure requirements, avoid direct contact to the transmitting antenna during transmitting.
 3. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

Operation on the 5.15 - 5.25GHz frequency band is restricted to indoor use only. The FCC requires indoor use for the 5.15-5.25GHz band to reduce the potential for harmful interference to co-channel Mobile Satellite Systems. Therefore, it will only transmit on the 5.25-5.35 GHz, 5.47-5.725 GHz and 5.725 – 5.850 GHz band when associated with an access point (AP).

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

RF Radiation Exposure Statement

For body contact during operation, this device has been tested and meets FCC RF exposure guidelines when used with an accessory that contains no metal and that positions the handset a minimum of 1.5 cm from the body. Use of other accessories may not ensure compliance with FCC RF exposure guidelines.

Canadian Compliance Statement

This Class B Digital apparatus meets all requirements of the Canadian

Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte les exigences du Règlement sur le matériel brouilleur du Canada.

European Conformity Statement

unitech Electronics co., Ltd herewith declares that the unitech product is in compliance with the essential requirements and all other provisions of the RED 2014/53/EU directive, the EMC 2014/30/EU directive and the Low Voltage 2014/35/EU directive.

The declaration of conformity is available for download at :
<https://portal.unitech.eu/public/Safetyregulatorystatement>

CE RF Exposure Compliance

This device meets EU requirements (2014/53/EU) on the limitation of exposure of the general public to electromagnetic fields by way of health protection. For body-worn operation, this device has been tested and meets the ICNIRP guidelines and the European Standard EN 62209-2, for use with dedicated accessories, SAR is measured with this device at a separation of 0.5 cm to the body, while transmitting at the highest certified output power level in all frequency bands of this device. Use of other accessories which contain metals may not ensure compliance with ICNIRP exposure guidelines.

CE Mark Warning



This equipment complies with the requirements of Directive 2014/53/EU of the European Parliament and Commission from 24 May, 2014 governing Radio and Telecommunications Equipment and mutual recognition of conformity.

RoHS Statement



This device conforms to RoHS (Restriction of Hazardous Substances) European Union regulations that set maximum concentration limits on hazardous materials used in electrical and electronic equipment.

Waste electrical and electronic equipment (WEEE)



unitech has set up a policy and process to meet the EU directive 2002/96/EC and update 2003/108/EC concerning electronic waste disposal.

For more detailed information of the electronic waste disposal of the products you have purchased from unitech directly or via unitech's resellers, you shall either contact your local supplier or visit us at :

<https://portal.unitech.eu/public/WEEE>

Taiwan NCC Warning Statement

低功率電波輻射性電機管理辦法

第十二條：經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

第十四條：低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前項合法通信，指依電信法規定作業之無線電通信。

低功率射頻電機需忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

注意事項：

1. 使用過度恐傷害視力。
2. 使用30分鐘請休息10分鐘；2歲以下幼兒不看螢幕，2歲以上每天看螢幕不要超過1小時。
3. 減少電磁波影響，請妥適使用。

Laser Information

The unitech product is certified in the U.S. to conform to the requirements of DHHS/CDRH 21CFR Subchapter J and to the requirements of IEC 825-1. Class II and Class 2 products are not considered to be hazardous. The unitech product contains internally a Visible Laser Diode (VLD) whose emissions do not exceed the maximum limits as set forth in the above regulations. The scanner is designed so that there is no human access to harmful laser light during normal operation, user maintenance or prescribed service operations.

The laser safety warning label required by the DHHS/IEC for the unitech product's optional laser scanner module is located on the memory compartment cover, on the back of the unit.

* Laser information only applies to the products with laser components.

CAUTION! Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light. Use of optical instruments with the scanner, including binoculars, microscopes, and magnifying glasses, with will increase eye damage. This does not include eyeglasses worn by the user.

LED Information

The unitech product contains LED indicator(s) or LED ring whose luminance is not harmful to human eyes during normal operation, user maintenance or prescribed service operations.

*LED information only applies to the products with LED components.

Battery Notice

1. To guarantee optimal battery performance we generally recommend you replace your rechargeable batteries every year, or after 500 charging cycles.
2. The battery may expand slightly at the end of its useful life. Please dispose the battery according your local battery disposal rules.
3. If a battery performance decreases below 20%, dispose of the battery according your local battery disposal rules.
4. The length of time a battery maintains its useful life depends on various factors. However, consider the following to prolong the useful life of the battery:
 - Avoid fully depleting the battery. Several partial drains with frequent charges are better than a totally depleted battery. Charging a partially charged battery does not harm the battery.
 - Keep the battery cool. For example, don't leave it in a hot vehicle.
 - For prolonged storage of over a month, discharge the battery to 40%.
5. Please do not leave battery unused for long time without charging it. Despite unitech's safety precautions, the battery pack may begin to change shape. If so, stop using it immediately. Please check to see if you are using a proper power adapter to charge the battery or contact your service provider for service.
6. If you cannot charge the battery after it has been idle for an extended period of time and it begins to heat up, please do not try to charge it. It may not be functional anymore.
7. Please only use the original battery from unitech. Using a third party battery can damage our products. Please note that when such damage occurs, it is not covered by your warranty.

CAUTION!

- RISK OF EXPLOSION IF BATTERY IS REPLACED INCORRECTLY. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.
- 如果更換不正確之電池行事會有爆炸的風險
請依製造商說明書處理用過之電池

Battery charge notice

It is important to consider temperature when the battery pack is charging. Charging is most efficient at normal room temperature or in a slightly cooler environment. It is essential that batteries are charged within the stated range of 0°C to 40°C. Charging batteries outside of the specified range could damage the batteries and shorten their life cycle.

CAUTION! Do not charge batteries at a temperature lower than 0°C. This will and make the batteries unstable and dangerous. Please use a battery temperature detecting device for a charger to ensure a safe charging temperature range.

CAUTION! To ensure the unit working properly, please keep all connectors away from the contaminants staying inside of them such as dust, grease, mud, and water. The negligence may cause the unit with no communication, short circuited, overheated and so on.

CAUTION! If the connector is damaged, please ensure the connector is being fully repaired before use the unit to avoid causing short circuited.

Storage and safety notice

Although charged batteries may be left unused for several months, their capacity may be depleted due to build up of internal resistance. If this happens, they will require recharging prior to use. Batteries may be stored at temperatures between -20°C to 60°C, however they may deplete more rapidly at higher temperatures. It is recommended to store batteries at room temperature.

** The message above only applies to the usage of the removable batteries.
For the products with non-removable batteries / without batteries, please refer to the specification of each product.*

Product Operation and Storage Notice

The unitech product has applicable operation and storage temperature conditions. Please follow the limitation of suggested temperature conditions to avoid failure, damage or malfunction.

**For applicable temperature conditions, please refer to the specification of each product.*

Adapter Notice

1. Please do not leave the power adapter in the socket when it is not connected to your unitech product for charging.
2. Please remove the power adapter when the battery is fully recharged.
3. The bundled power adapter that comes with your unitech product is not meant to be used outdoors. An adapter exposed to water or rain, or a very humid environment can cause damage to both the adapter and the product.
4. Please only use the bundled power adapter or same specification of adapter to charge your unitech product. Using the wrong power adapter can damage your unitech product.

** The message above only applies to the product connected to the adapter.
For the products without using the adapters, please refer to the specification of each product.*

Hearing Damage Warning

Zx.3 Warning

The warning shall be placed on the equipment, or on the packaging, or in the instruction manual and shall consist of the following:

- the symbol of Figure 1 with a minimum height of 5 mm; and
- the following wording, or similar :

To prevent possible hearing damage, do not listen at high volume levels for long periods.



Figure 1 – Warning label (IEC 60417-6044)

Alternatively, the entire warning may be given through the equipment display during use, when the user is asked to acknowledge activation of the higher level.

Worldwide Support

unitech's professional support team is available to quickly answer questions or assist with technical-related issues. Should an equipment problem occur, please contact the nearest unitech regional service representative.

For complete contact information please visit the Web sites listed below:

Taipei, Taiwan – Headquarters Tel: +886-2-89121122 E-mail: info@hq.ute.com Address: 5F, No. 136, Lane 235, Baoqiao Road, Xindian District, New Taipei City 231, Taiwan (R.O.C.) Website: http://www.ute.com	Europe Tel: +31-13-4609292 E-mail: info@eu.ute.com Address: Kapitein Hatterasstraat 19, 5015 BB, Tilburg, the Netherlands Website: http://eu.ute.com
China Tel: +86-59-2310-9966 E-mail: info@cn.ute.com Address: Room401C, 4F, RIHUA International Mansion, Xinfeng 3rd Road, Huoju Hi-tech District, Xiamen, Fujian, China Website: http://cn.ute.com	Japan Tel: +81-3-35232766 E-mail: info@jp.ute.com Address: Kayabacho Nagaoka Building 8F., 1-5-19 Shinkawa, Chuo-Ku, Tokyo, 104-0033, Japan Website: http://jp.ute.com
Asia & Pacific / Middle East Tel: +886-2-27911556 E-mail: info@apac.ute.com info@india.ute.com info@mideast.ute.com Address: 4F., No. 236, ShinHu 2nd Rd., NeiHu Chiu, 114, Taipei, Taiwan Website: http://apac.ute.com / http://mideast.ute.com	Latin America Tel: +52-55-5171-0528 E-mail: info@latin.ute.com Address: 17171 Park Row, Suite 210 Houston, TX 77084 USA (Rep.) Website: http://latin.ute.com
North America Tel: +1-714-8926400 E-mail: info@us.ute.com / info@can.ute.com Address: 6182 Katella Ave, Cypress, CA 90630, USA Website: http://us.ute.com	Please scan QR Code to visit us : 

Warranty Policy

The items covered under the unitech Limited Warranty are free from defects during normal use.

The warranty period is varied from each country. Please consult with your supplier or unitech local office for actual length of warranty period to your purchased product.

Warranty becomes void if equipment is modified, improperly installed or used, damaged by accident or neglect, or if any parts are improperly installed or replaced by the user.

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Chapter 1 - Overview

1.1 Package

Please make sure the following contents are in the RS200 (PC Based) gift box. If something is missing or damaged, please contact your unitech representative.

The standard package contents:

- RS200 (PC Based)
- Cable
- Regulatory Compliance Statements
- Pluggable Terminal Blocks

1.2 Product Detail



LED Indicator :
Red Light – Power On



1.3 Specifications

RFID Performance & Interface	
Standard Supported	EPC Class 1 Gen2
RFID Engine	ThingMagic M6e Micro
Fastest Read Rate	750 tags/sec
Antenna Ports	2 ports with RP-SMA connectors
RF Power output	0dBm to 30dBm, ± 1.0 dBm (Default 30dBm) 0dBm to 24dBm (JP SKU only)
RF Power control	Command-adjustable
Frequency Range	EU: 865-868 MHz US: 902-928 MHz TW: 922-928 MHz CN: 920-925 MHz JP1: 916-924 MHz (250mW LBT max, 19CH) JP2: 916-920 MHz (1W Mirror-Subcarrier) -5 dBm to +30 dBm in 0.5 dB steps
Frequency Region	Pre-configured for these regions:US/EU/JP/TW/CN
User Environment	
Vibration	MIL-STD-810G. Method 514.6 Procedure I
Shock	MIL-STD-810G. Method 516.6 Procedure I
Operating Temp.	-20 ~ 60°C
Storage Temp.	-40 ~ 80°C
Humidity	5-95% non-condensing
Electrostatic Discharge	+/-12kV air discharge +/-8kV contact discharge
Communication	
USB Interface	Micro USB connector

Serial Interface	2 UART Pins (5-pins terminal block connector)
Digital IO Interface	4 GPIO Pins (8-pins terminal block connector)
Electrical	
Power	DC Jack-in (connected to 12V power adapter) 2 Pins DC Terminal blocks input (12 to 24 VDC)
Push Button	For warm reset
LED	Power Indicator
Physical Characteristics	
Dimension	100 x 89.4 x 27mm
Weight	216g
Housing Material	Metal

Chapter 2 - Configuring RS200 (PC Based)

2.1 Configure Settings

2.1.1 Power Requirements

- 12V ~ 24V DC
- Power supply (12V/2A, unitech PN 1010-900007G)

2.1.2 Supported Operating Environments

Software tools for RS200 PC based will be leveraged from official release of ThingMagic M6e at below link:

- Demo utility : URA (Universal Reader Assistant)
 - URA 32 bit
<http://w3.tw.ute.com/pub/cs/product/RS200/URA/32-bit-installer-for-Universal-Reader-Assistant-4.31.3-from-API-1.31.3%20.zip>
 - URA 64 bit:
<http://w3.tw.ute.com/pub/cs/product/RS200/URA/64-bit-installer-for-Universal-Reader-Assistant-4.31.3-from-API-1.31.3.zip>
- Android demo code:
http://w3.tw.ute.com/pub/cs/product/rs200/android_sample/RFIDdemo.zip

2.1.3 Supported Communication Protocol

- Micro USB
- RS232 switchable Serial Interface
- GPIO:
 - Photo Isolated Input x 2
 - Photo Isolated Output x2

2.1.4 Antenna Requirements

- unitech UHF US P/N: 205367G
- unitech UHF EU P/N: 205488G
- unitech RF cable P/N: 1550-900102G
- Option, Follow ThingMagic's Spec

M6e-Micro Authorized Antennas

Vendor	Model	Type	Polarization	Linear Gain 1 (dBi)	Frequency
JOYMAX	GPX-020ASFR9-752	Patch	Circular	5.85	902-928 MHz

Note :

- These are circularly polarized antennas, but since most tag antennas are linearly polarized, the equivalent linear gain, as provided, of the antenna should be used for all calculations.

■ Antenna testing scenario

- Antenna: 205367G (US _ Antenna)
- Tag: 382499G(ALN-9640)*75pcs
- Power: 30 dBm
- Dwell Time: 1,000
- Dynamic: Q
- Test Results:

Test Condition	Power: 30dBm, Dwell Time: 1000, Dynamic: Q Frequency: auto change, use 75 unique tags		
When the reading distance is fixed	0.5 Meter		
Reading Time	5 sec.	10 sec.	20 sec.
How many unique tags have been read	75 tags	75 tags	75 tags
Reading Rate	610 tags per sec.	612 tags per sec.	604 tags per sec.
When the reading distance is variable	3 Meters	5 Meters	10 Meters
Reading Time	10 sec.	10 sec.	10 sec.
How many unique tags have been read	59 tags	47 tags	2 tags
Reading Rate	151 tags per sec.	113 tags per sec.	5 tags per sec.

2.1.5 Environmental Specifications

Most applications involve the module transmitting periodically to inventory tags in the field. The longer the transmitter is on in relation to its off time (the “duty cycle”) the faster the temperature will rise. The module will not transmit if the temperature is at a dangerous level, but will transmit again as soon as the temperature drops – often so quickly it is hardly noticeable. Other factors that affect the time before the module begins to protect itself is the ambient temperature and the power level at which the module is transmitting. These factors are represented in the following table, which give the typical minutes of transmission time before thermal protection is enabled:

Ambient Temp. (c)	RF Power (dBm)	Duty Cycle %	Time (m) to reach max temperature
-40	30	98	No restriction
25	23	50	No restriction
25	23	60	2.93
25	23	80	2.22
25	23	98	1.24
25	30	40	No restriction
25	30	50	6.68
25	30	60	2.49
25	30	80	1.5
25	30	98	1.06
60	23	30	5.64
60	23	50	1.13
60	23	60	0.81
60	23	80	0.54
60	23	98	0.29
60	30	15	No restriction
60	30	30	1.98
60	30	50	0.73
60	30	60	0.56
60	30	80	0.27
60	30	98	0.27

2.2 RFID Services

2.2.1 RFID module status

- When connect to power, the first LED will turn solid red light which means the connection is working successfully.
- The first LED will flash red light which means data is transforming.

2.2.2 How to connect the reader

Please follow the instructions below for RS200 (PC Based) connection.

Note: download URA (demo utility) first.

- Demo utility : URA (Universal Reader Assistant)
 - URA 32 bit
<http://w3.tw.ute.com/pub/cs/product/RS200/URA/32-bit-installer-for-Universal-Reader-Assistant-4.31.3-from-API-1.31.3%20.zip>
 - URA 64 bit:
<http://w3.tw.ute.com/pub/cs/product/RS200/URA/64-bit-installer-for-Universal-Reader-Assistant-4.31.3-from-API-1.31.3 .zip>

Step 1. Connect power to RS200, the LED will show red light.

Step 2. Insert USB cable on both RS200 and the PC host.

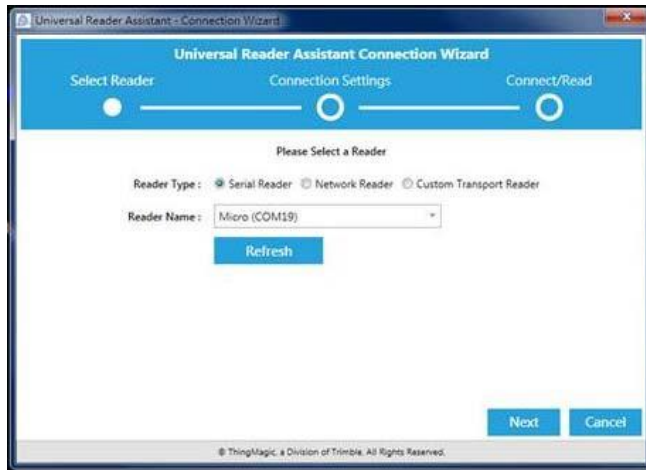
Step 3. Attach antenna to RS200 with RF cable.



Step 4. Please click Universal Reader Assistant icon on the screen to start the

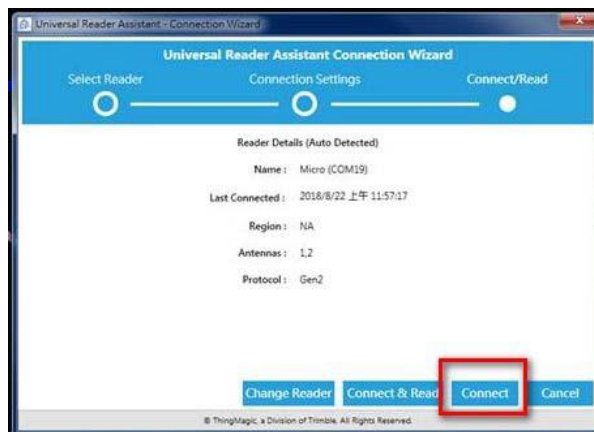
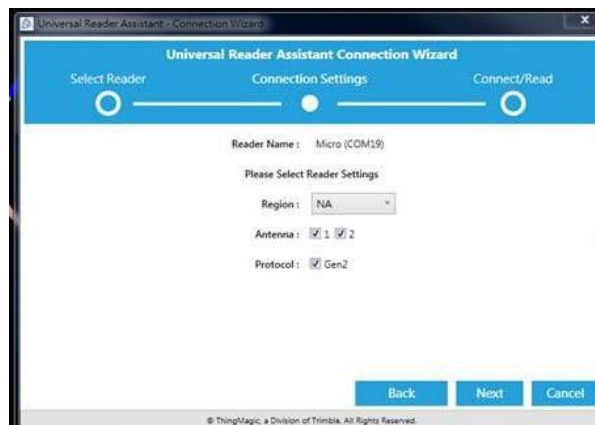


connection. Click Next for the next step.



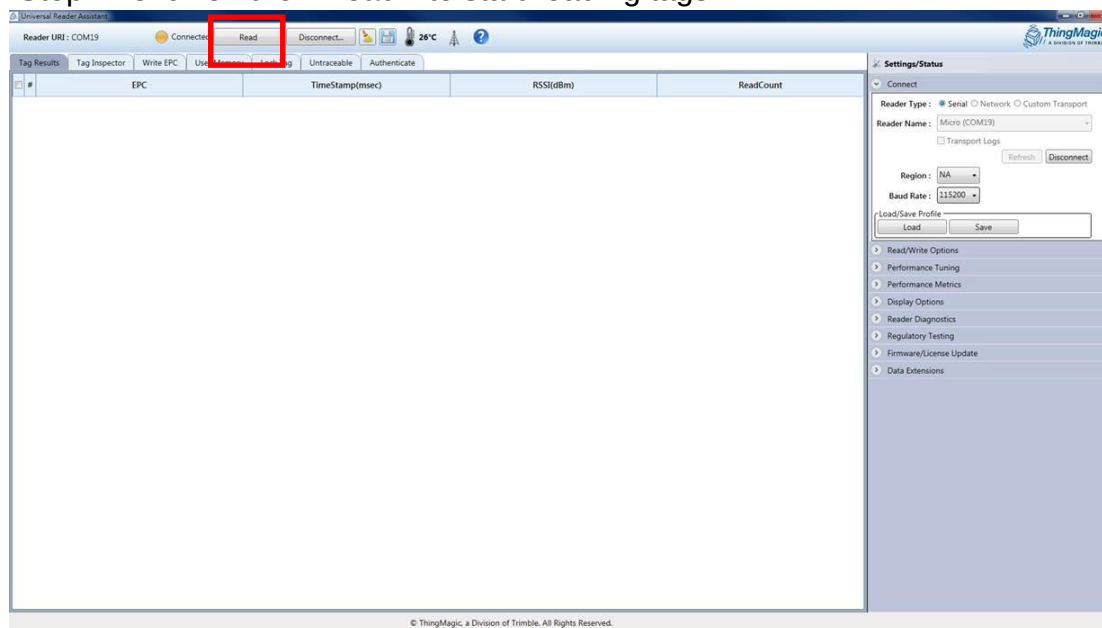
Step 5. Select Region and antenna port, click **Next**.

Step 6. Click **Connect**.



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Step 7. Click on the “**Read**” to start reading tags.



2.2.3 RFID performance

- High Speed (M6e-Micro) : Read Rate: Up to 750 tags/sec
 - Follow ThingMagic definiton
 - Tag can be read repeatedly

Chapter 3 – USB & RS232

GPIO Interface Introduction

3.1 How to Use the Interface

3.1.1 USB Device Type

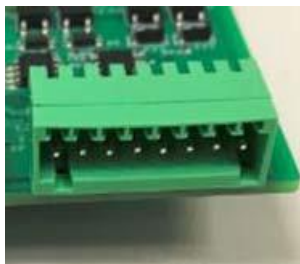
- Micro USB

3.1.2 RS232 (from left to right)



Pin	RS-232
1	RX
2	TX
3	GND
4	-
5	-

3.1.3 GPIO (from left to right)

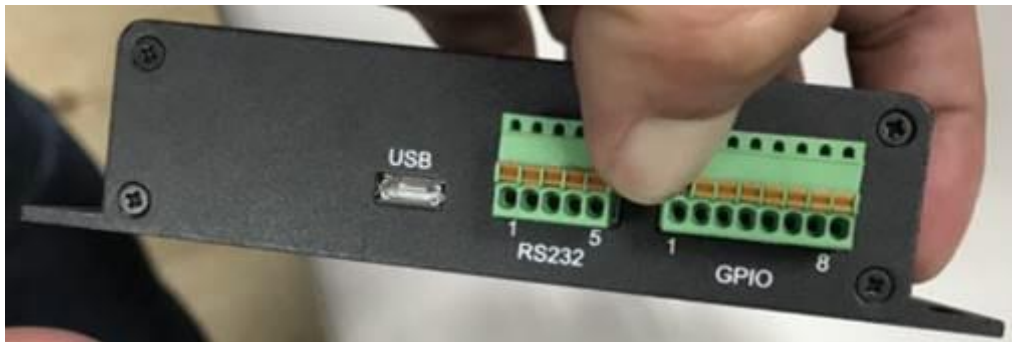


Pin	I/O Name
1	Vout 12V /200mA
2	V-GPIO(12V) /200mA
3	DPO
4	DPO
5	DPI
6	DPI
7	GND
8	GND

3.1.4 How to connect wires to GPIO

Please press the button (as shown below), then insert it in the corresponding socket.

Step 1: Press the yellow button and don't release it



Step 2: Insert the line in the corresponding socket.



Step 3: Then release the button



3.2 Reset Button

Short press: Hardware reset (quick click)

Long press: Factory reset (press over 10 seconds)

