R300 Series

Access Door Reader

User Manual

Version 3.0

Copyright Information

This equipment is intended for use by technical professionals or maintenance personnel.

Trademark Information

General Notice

tions

Warning

- This manual is an integral part of the machine. Please read carefully.
- Keep the manual for later use when maintaining the machine.

- This machine can only be used for the designated purposes. Never use it for any other purpose.
- The manufacturer is not held responsible for the damage incurred by improper use or use other than the intended purpose.

Precautions

- This equipment must be operated by qualified personnel who have been gone through special training programs. Any modification or change of application range to this machine may cause direct or indirect damages to equipment without obtaining permission from manufacturer or not following the instruction of the manual.
- R300 access door reader should be installed on the wall.
- Do not put R300 access door reader in a place with extreme temperature or moisture, or near the heating system, water tap, air-humidifier or furnace.
- Keep the machine from dust, ammonia, alcohol, thinner or spraying binder.

Version History

Version	Date	Document Version History
V1.0	7- Sep-2012	Original Version
V2.0	23-Jun-2013	V2.0 Version
V3.0	19-Dec-2016	V3.0 Version

Table of Contents

1 Overview

R300 series access door reader integrate the state-of-the-art technology for access control solution which equips with keypad and OLED as optional for flexible operation. R300 is fully featured high frequency reader to support multi types 13.56MHz technology contactless card including ISO14443A/B, and MIFARE even Mifare plus and DESFire EV1. The mobile phone application integration based on NFC ISO18092 and Bluetooth create innovative and fashionable system. What's more, original impact design provide ease of installation in various door access indoor and outdoor applications.

1.1 Features

- NFC functionality(ISO18092)
- Bluetooth4.0
- High level command and high security of Mifare Plus, DesFire EV1
- TCP/IP communication and POE(Power over Ethernet)
- Firmware upgrade through web page
- OLED Display(128 x 64 OLED 1.54")
- Selective card polling capability(for several cards reading operation)
- Auto answer mode: continuously read and send card info
- Excellent and compact design, can be placed on the metal surface
- IP65, electric epoxy potted for harsh environment

1.2 Product pictures

R301

R302

R303

1.3 Specifications

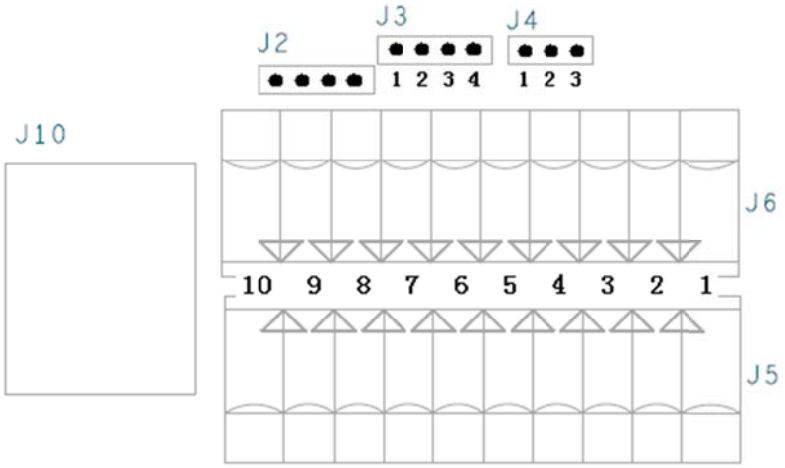
Model	R300 Series
Standard	ISO 14443A/ISO14443B/ISO18092 NFC 125KHZ EM
Readable Cards	EM4100,MifareS50,MifareS70,Ultralight, UltralightC, Mifare Plus, DESFireEV1(2K,4K,8K),SonyFelica,NFC,14443BCPU, ISO14443A compatible cards
Writeable Cards	Mifare S50, MifareS70, Mifare Plus, , DESFire EV1 (2K, 4K, 8K), Ultralight ,Sony Felica,NFC,14443B CPU
Operating Frequency	125KHZ/13.56 MHz
Power Supply	9-24V DC, <150mA POE (IEEE802.3af High Power interface, optional – over JACK connector),
DISPLAY	128 x 64 OLED(1.54")
Interface	RS232, Wiegand26/34/42/50/58,RS485,TCP/IP,Bluetooth4.0
Reading output format	Wiegand26/34/42/50/58
Keypad output format	4bit or 8bit
Keypad	3*4 keypad with backlight and BELL
Indicators	2 Leds and Buzzer controlled by two-wires
Connection	Connector
Reading Distance	50 - 100mm (depending on antenna, transponder)
Writing Distance	30 - 50mm (depending on antenna, transponder)
Operating Temperature	-10°C ~ +60°C / 14°F ~ +140°F
Storage Temperature	-20°C ~ +70°C / -4°F ~ +158°F
Operating Humidity	0 ~ 95% relative humidity non-condensing
Housing Material	ABS+PC
Protection Class	IP65, electric epoxy potted for harsh environment

1.4 R300 series exterior design difference

Model / Configuration		**BELL**	**KEY PAD**	**OLED**	**Finger Print**
R300 Series	R301	●			
	R302	●	●		
	R303	●	●	●	

2 Wiring

2.1 Connector Pin definition



Description J6			Description J5		
1	DC+	DC 9-24V Input	1	VCC	DC_OUT 9-24V
2	GND	Power ground	2	GND	Power ground
3	TX2	RS485/232 transmit	3	NC1	Lock Normally closed of lock relay
4	RX2	RS485/232 receive	4	CO1	Lock Common port of lock relay
5	D0	Wiegand data0	5	NO1	Lock Normally open of lock relay
6	D1	Wiegand data1	6	NC2	Alarm Normally closed of lock relay
7	LED	Green LED	7	CO2	Alarm Common port of lock relay
8	BUZ	Buzzer	8	NO2	Alarm Normally open of lock relay
9	BEL-	BELL-	9	BUT	Exit Button
10	BEL+	BELL+	10	SEN	Door Sensor

Description J3

This jumper always open in normal work. When this jumper (2,3PIN or 3,4PIN) is to be shorted, device restore to factory default setting

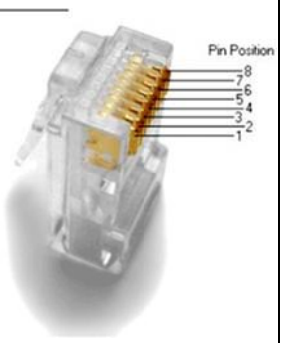
Description J4

This jumper always open in normal work. When this jumper (1,2PIN) is to be shorted before supplying power, device switch to the mode of program download & update (for RS232 and RS485 interface)

Description J10

Ethernet & Power Cable connection

PIN	POE	Non-POE
1	TX+	TX+
2	TX-	TX-
3	RX+	RX+
4	Power+	unused
5	Power+	unused
6	RX-	RX-
7	Power-	unused
8	Power-	unused

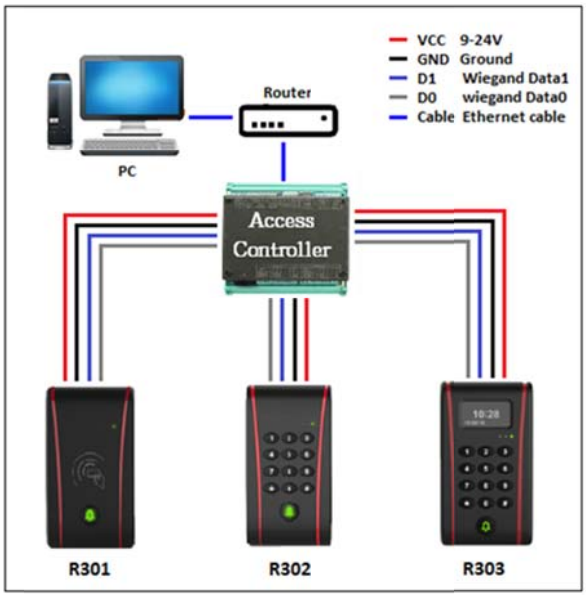


UTP Connector

2.2 Wiring diagrams

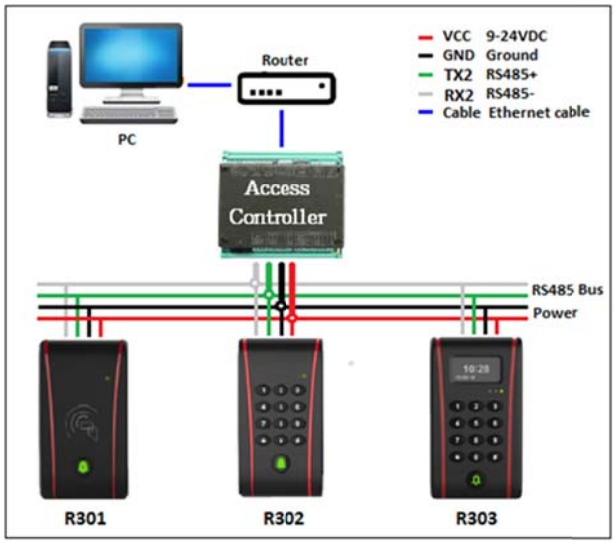
2.2.1 Wiegand interface

R300 series Reader		Controller
Power		
VCC	→	VCC(+)
GND	→	GND(-)
Communication		
WG_D1	→	WG_D1
WG_D0	→	WG_D0



2.2.2 RS485 interface

R300 series Reader		Controller
Power		
VCC(+) GND(-)	→	External adapter (9-24VDC) or POE
RS485 Communication		
TX2	→	RS485+
RX2	→	RS485-

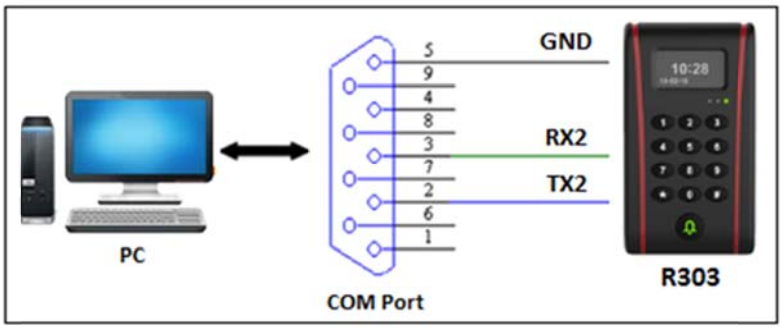


Note:

1. Please refer to the file “Configuration Tool Guidance” to set device address.
2. Please make sure that the controller will use the same communication protocol as R300 Series Please refer to the file “Communication Protocol”.

2.2.3 RS232 interface

R300 series Reader		
Power		
VCC(+) GND(-)	→	External adapter (9-24VDC)
RS232 Communication		
TXD	→	COM Port PIN2
RXD	→	COM Port PIN3
GND	→	COM Port PIN5



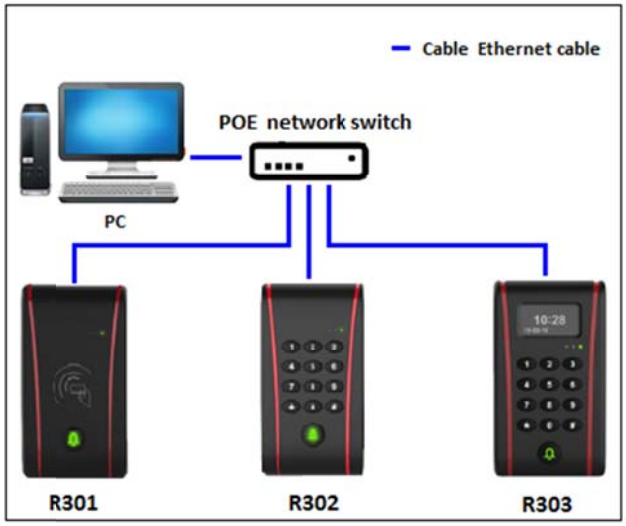
2.2.4 TCP Interface

Power

POE(Power over Ethernet)

TCP Communication

Standard Ethernet cable（TX+ TX- RX+ RX-）



3 Reader Configuration

3.1 System Application Development

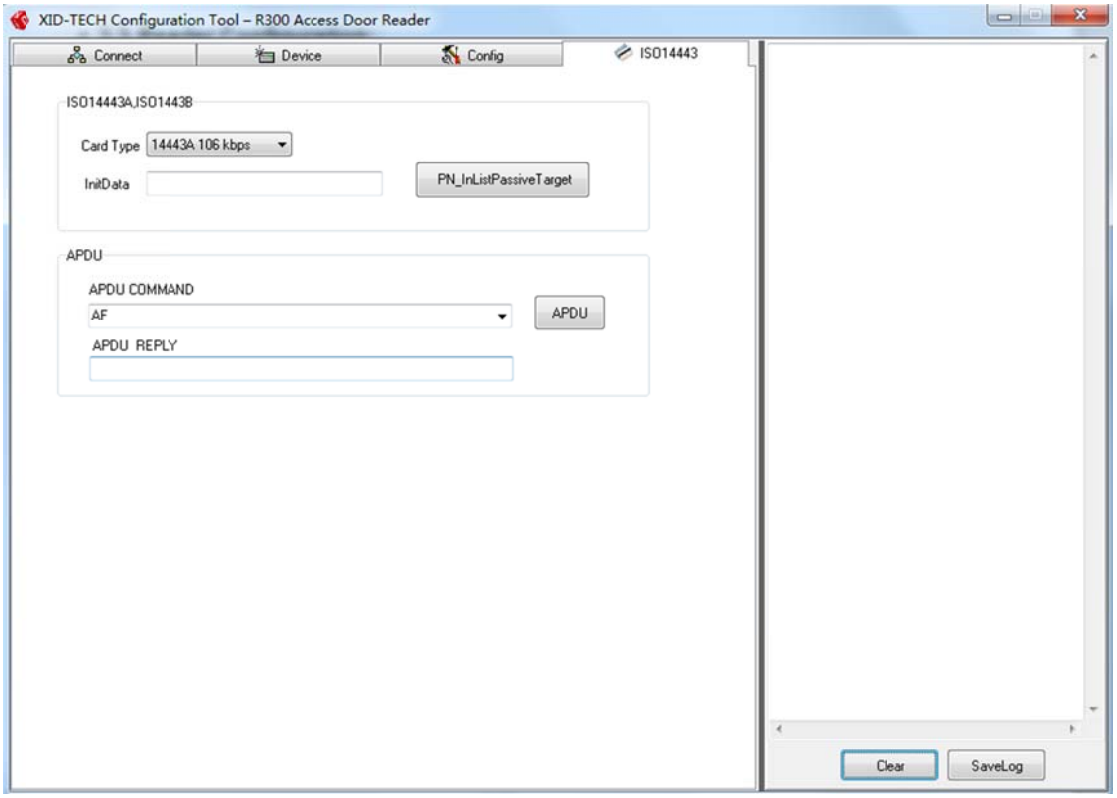
XID offer robust API s API function easy to user for further application development and system integration, which allow user to call API function to program directly. The user will be recommend to read that explanation documentation “R300 Series Reader SDK” carefully before starting the system development.

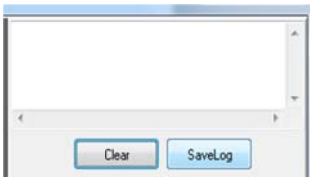
3.2 ConfigTool function introduction

- Test device function and features
- Device configuration(Interface, output format, card reading)
- RFID card operation testing

3.3 Reader Configuration:

Configuration Tool overview

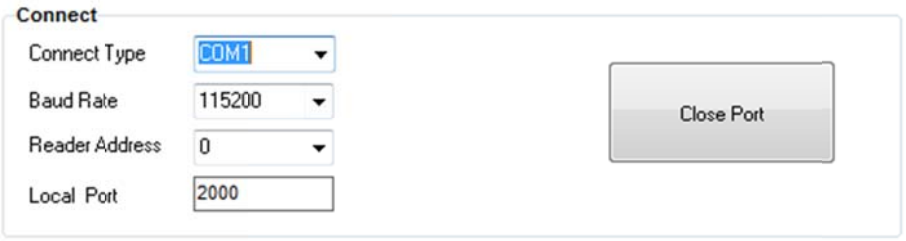


Connect	Connect Device to Configuration Tool	
Device	General Testing	
Config	Device Configuration(Interface, card reading)	
Card Operation	Supported Card Operation	
Message Window	Show the status and results of each executed Command. ● **Clear** Clear the Message Window ● **Save Log** The messages in the Message Window will be saved as log file. The log file is a text file with the default name “yyyyMMDDHHmmss.txt”,e.g: “20161216181539.txt”	

3.3.1 Connect:

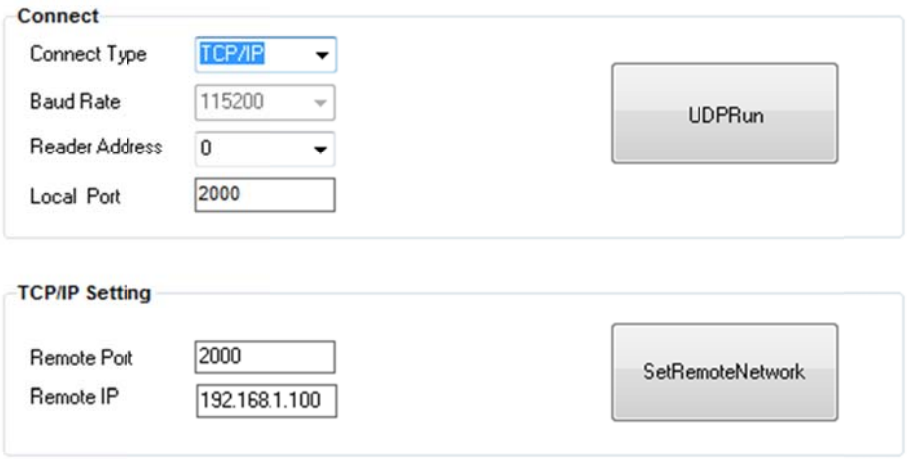
The R300 Series support RS232/RS485 and TCP/IP communication

1. R300 Series Communication RS232/RS485 port setting:



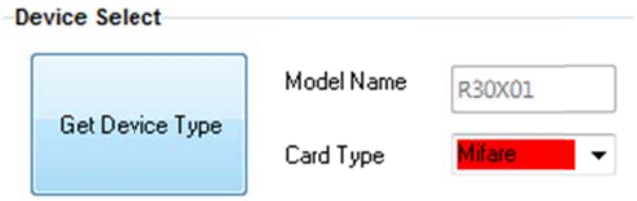
Step 1	Connect Type	Select” COM?” according to your PC manager indication
Step 2	Open Port	Click “Open Port” Button
Step 3	Baud Rate Setting	Set the speed of serial port communication, the default setting is 115200bps Only for com (RS232/RS485) port communication configuration
Step 4	Reader Address	0: broadcast address, configure all reader parameter of RS485 CAN bus 1~255: configure the exact reader parameter Note: set” reader device address” in “ config” interface

2. R300 Series Communication TCP/IP port setting:



Step 1	Connect Type	Select" TCP/IP"
Step 2	Remote IP Setting	key in "192.168.1.100", default setting is "192.168.1.100"
Step 3	SetRemoteNetwork	Click "SetRemoteNetwork" Button
Step 4	UDPRun	Click "UDPRun " button

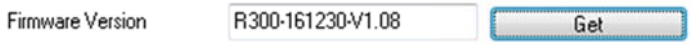
3. Device Select



Step 1	Get Device Type	Click "Get Device Type " button
Step 2	Card Type	Select the exact card interface you want to operate

3.3.2 Device

1. Get Firmware Version



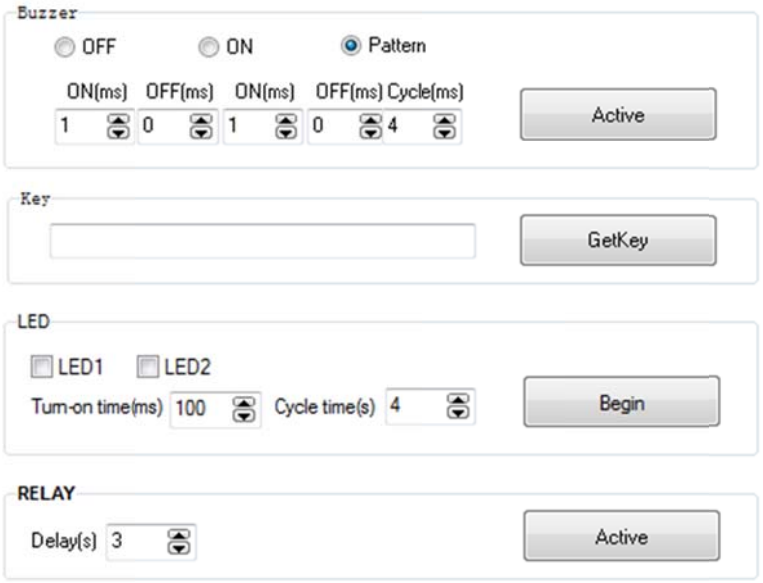
2. Get Serial Number

The serial number is a unique number which preset by manufacture.

3. LED Indicator

Step 1	Set testing LED	Click "LED1(Power)" or "LED2(Read card)" Button
Step 2	Set Blinking Pattern	Set the time for "Turn-ON" & "Cycle" Button
Step 3	Test	Click" Begin"Button

4. Buzzer Indicator



Step 1	Set Beep Mode	Click “OFF or “ON” or “Pattern” Button
Step 2	Set Beep frequency	Set the time for “ON” & “Cycle” &”Cycle” Button
Step 3	Test	Click”Active” Button

3.3.3 Config

Users can realize the auto-read mode by Config tool setting, it supports three types card setting as Mifare, Mifare Plus and DESFire EV1

Step 1	Interface connection	Check “ UART out Enable” and Select” **set wiegand**” Button
Step 2	Wiegand setting	Click” Wiegand output format” to select the exact format
Step 3	Run	Click “set” and “Run”
Step 4	Read card	Read your card on device
Step 5	Message output	Check the output data on the message window

3.3.4 Calculate Format for Wiegand26- Wiegand 58

1. The format for Wiegand58 is as below:

1.1 MSB is even parity bit, LSB is odd parity bit.

1.2 The bits for calculating even parity are within the first 28 bits, but don’t use the bits from 21 to 24.Actually it uses 24 bits for even parity.

1.3 The bits for calculating odd parity are within the last 28 bits, but don’t use the last 8 bits within these 28 bits. Actually it uses 20 bits for odd parity.

For example:

Data Hex: 00 00 00 89 D4 1B 81

Data Binary:00000000 00000000 00000000 10001001 11010100 00011011 10000001

MSB: 1 from 00000000 00000000 00000000 1000 (Red part don't use)

LSB: 1 from 1001 11010100 00011011 10000001 (Red part don't use)

Output: 1 00000000 00000000 00000000 10001001 11010100 00011011 10000001 1

2. The format for Wiegand26 is as below:

2.1 MSB is even parity bit, LSB is odd parity bit.

2.2 The bits for calculating even parity are within the first 12 bits

2.3 The bits for calculating odd parity are within the last 12 bits.

For example:

Data Hex: D4 1B 81

Data Binary: 11010100 00011011 10000001

MSB: 1 from 11010100 0001

LSB: 0 from 1011 10000001

Output: 1 11010100 00011011 10000001 0

3. The format for Wiegand32 is as below:

3.1 MSB is even parity bit, LSB is odd parity bit.

3.2 The bits for calculating even parity are within the first 15 bits.

3.3 The bits for calculating odd parity are within the last 15 bits.

For example:

Data Binary: 00111111010101010101010110010000

MSB: 1 from 001111110101010

LSB: 1 from 101010110010000

Output: 1 00111111010101010101010110010000 1

4. Wiegand32e don't have odd/even parity bits.

5. The format for Wiegand34 is as below:

5.1 MSB is even parity bit, LSB is odd parity bit.

5.2 The bits for calculating even parity are within the first 16 bits.

5.3 The bits for calculating odd parity are within the last 16 bits.

For example:

Data Hex: 89 D4 1B 81

Data Binary: 10001001 11010100 00011011 10000001

MSB: 1 from 10001001 11010100

LSB: 1 from 00011011 10000001

Output:1 10001001 11010100 00011011 10000001 1

6. Wiegand40 don't have odd/even parity bits.

7. The format for Wiegand42 is as below:

7.1 MSB is even parity bit, LSB is odd parity bit.

7.2 The bits for calculating even parity are within the first 20 bits.

7.3 The bits for calculating odd parity are within the last 20 bits.

For example:

Data Hex: 00 89 D4 1B 81

Data Binary: 00000000 10001001 11010100 00011011 10000001

MSB: 0 from 00000000 10001001 1101

LSB: 0 from 0100 00011011 10000001

Output: 0 00000000 10001001 11010100 00011011 10000001 0

8. The format for Wiegand50 is as below:

8.1 MSB is even parity bit, LSB is odd parity bit.

8.2 The bits for calculating even parity are within the first 24 bits.

8.3 The bits for calculating odd parity are within the last 24 bits.

For example:

Data Hex:01 00 89 D4 1B 81

Data Binary: 00000001 00000000 10001001 11010100 00011011 10000001

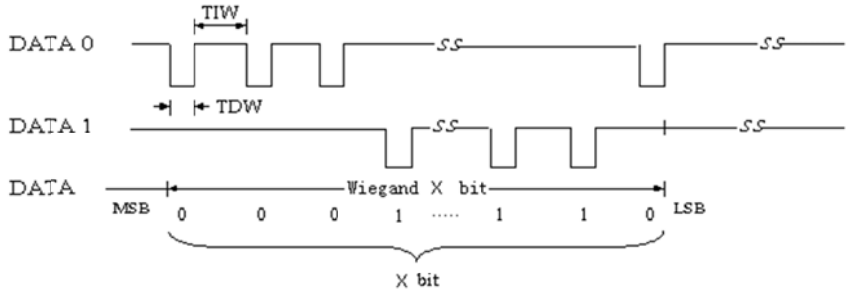
MSB: 0 from 00000001 00000000 10001001

LSB: 1 from 11010100 00011011 10000001

Output: 0 00000001 00000000 10001001 11010100 00011011 10000001 1

9. Wiegand56 don't have odd/even parity bits

Wiegand Frame



SYMBOL	Parameter	Limits Min.	Limits Max.	Type	UNITS
TDW	Data Pulse width time	20	100	50	uS
TIW	Data Pulse interval time	0.2	4	2	mS

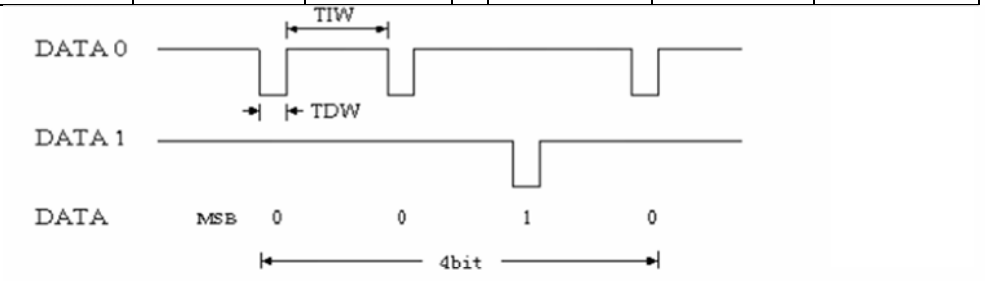
1 is represented by a 50 usec low pulse on DATA1

0 is represented by a 50 usec low pulse on DATA0

3.3.5 Key 4bit /8bit Burst Output Format

When Key been pressed, the 4bit Pulse signal will output from pin DATA0 and pin DATA1

Keypads	Binary	Hex		Keypads	Binary	Hex
0	0000	0		6	0110	6
1	0001	1		7	0111	7
2	0010	2		8	1000	8
3	0011	3		9	1001	9
4	0100	4		*	1010	A
5	0101	5		#	1011	B



SYMBOL	Parameter	Limits Min.	Limits Max.	Type	UNITS
TDW	Data Pulse width time	20	100	50	uS
TTW	Data Pulse interval time	0.2	4	2	mS

When Key been pressed, the 8bit Pulse signal will output from pin DATA0 and pin DATA1

Keypads	Binary	Hex		Keypads	Binary	Hex
0	00000000	0		6	01100110	6
1	00010001	1		7	01110111	7
2	00100010	2		8	10001000	8
3	00110011	3		9	10011001	9
4	01000100	4		*	10101010	A
5	01010101	5		#	10111011	B

3.3.6 LED&Buzzer Controller(By external)

- **Internal Control**

  Green LED and Buzzer are controlled inside as default. The status will show as below:

  a. Reader power on: Red LED will be always light and Buzzer beep one time

  b. Read card succeed: Green LED will be light one time and Buzzer beep one time

- External Control

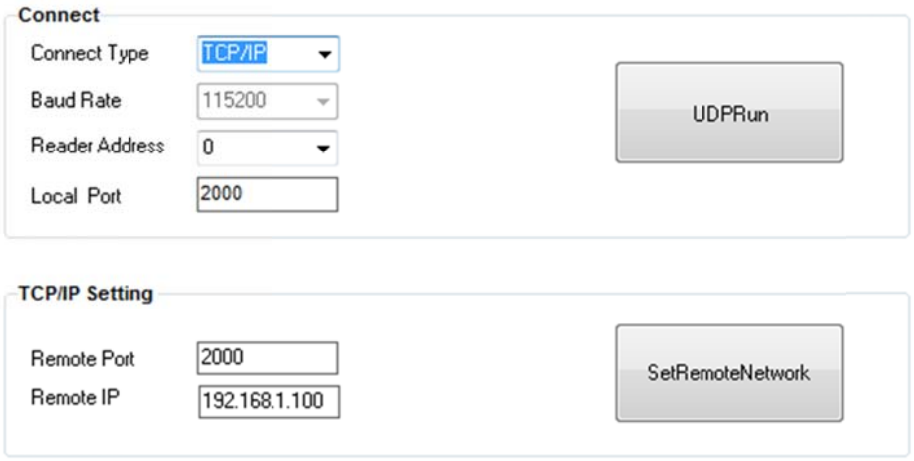
  Green LED & Buzzer are to be controlled by two external wires.C_LEDG wire controls green LED, C_Buzzer wire controls Buzzer

  a. Connect to Low level(GND): Green LED lights, or Buzzer beeps

  b. Disconnect GND: Close LED & Buzzer indication

3.4 TCP/IP communication

1. Choose “TCP/IP” in connect type box, as follow:



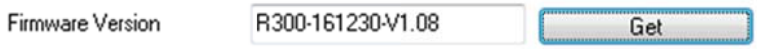
2. Set the Remote IP address for the device

Note: The IP address default setting is 192.168.1.100 which built in machine. It can be changed by using in your actual network environment. That will be description in TCP/IP web server part.

3. Click “SetRemoteNetwork” button

4. Please click “GET Device Type” button

5. The testing of TCP/IP working status. Please select Device menu
6. Click “Get Firmware Version” button
   If the host PC and the device keep normal the TCP/IP communication, the device will return the firmware version information, show as follow:



   Otherwise, please check the TCP/IP connection line and host PC TCP/IP settings, and then repeat step 1 to 4.
7. Stop TCP/IP communication
   Click “UDPStop” button

4 The Web Server service of reader

We built in a web server service for R300 series access door reader, so you can access the web server via host PC, it features the below functions:

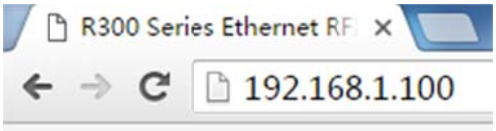
1. Get/Set IP address, sub MASK, Gate Way, firmware version, module name etc.
2. Reset the machine
3. Firmware Upgrade
4. Time Configuration
5. Restore factory default setting
6. Change password for the account

4.1 Login in web server by IE explorer

Explorer: Microsoft IE explorer or other explorer, such as Google Chrome.

Note: We recommend internet explorer is Google Chrome.

Step 1: Fill IE explorer with the reader's IP address at URL address bar, example as follow:



If the machine is running and the TCP/IP connection form host to machine is working well, it will show like this:

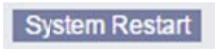
Step 2: Enter the correct password after click submit button.

Note: default account is "admin", Password is "admin" (modifiable login password)

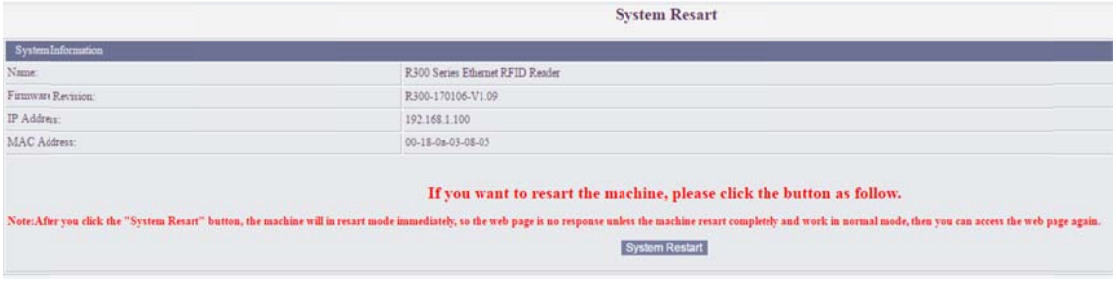
The background and style of the pages may be some difference for different firmware version

4.2 System reset via web page

It's easy to reset the system of the machine via web pages, click "System Reset" on home page.



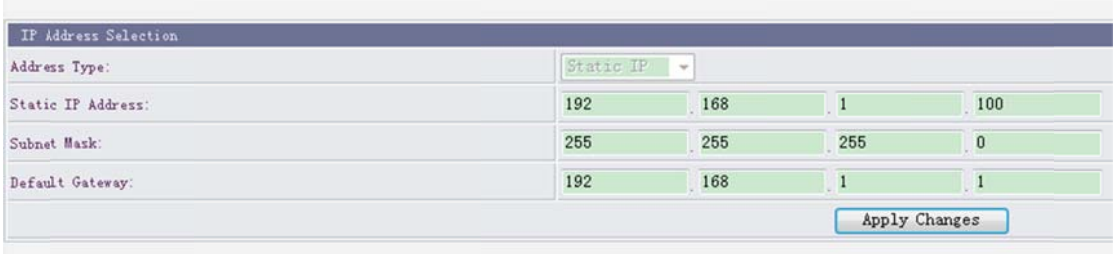
The page show as below:



Click the "system restart" button, and then the device enter in reset mode. After few seconds, it finish to reset and return to the web page again.

4.3 IP address reconfiguration

The reader built in default IP parameters as follow:



User can reconfiguration it by actual network using. Click" apply changes " button to submit your change.

Note1: If the IP parameters changed, the new parameters will be effective after resetting the machine

Note2: If the IP address changed, please use the new address to login in the web page.

4.4 MAC address

Each TCP/IP Reader has a unique MAC address, it has been set in manufacture procedure. Therefore, user do not need to change it, because it maybe result in some TCP/IP communication problems.

Please don't use the MAC configuration function as follow:

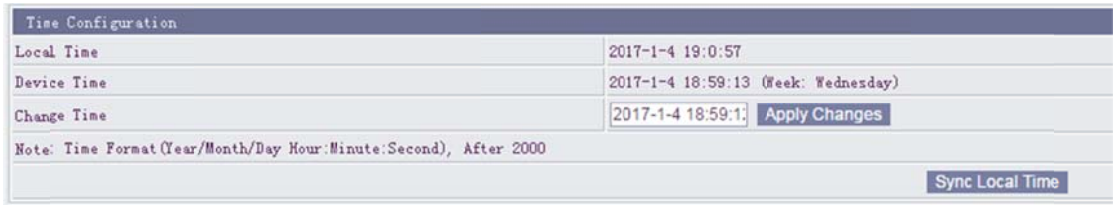
4.5 module name redefinition

Change the default module name

Note: The module name length less than 40 characters.

4.6 Changes or Sync device time

When the machine time take error, please change or synchronize machine time by computer as follow:



4.7 Restore factory defaults of web configuration

Note1: If the load the factory defaults, it will be effective after resetting the machine.

Note2: Please use the default IP address to login the web pages after machine reset completed.

Note3: The factory default IP address is "192.168.1.100"

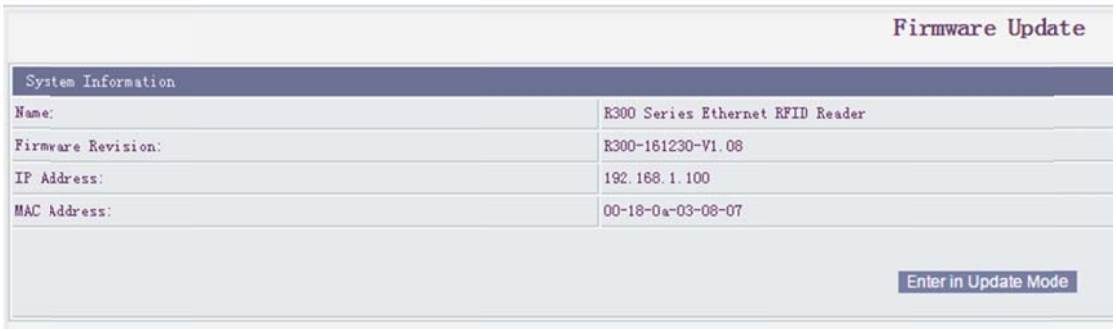
4.8 Firmware Upgrade

Two solutions to upgrade firmware

Solutions 1: Firmware Upgrading via web page

1. Log to upgrading web page

Click “ Firmware Update ” on home page . Enter in upgrading web page, show as follow



2. click “ Enter in Update Mode

How to judge reader successfully enter in update mode ?

If reader enter into updating mode, the red yellow green led in reader front will be light and flashed off.

Note1: The factory default IP address is “192.168.1.100”

3. Login web server update Firmware again. If succeed, it will show:

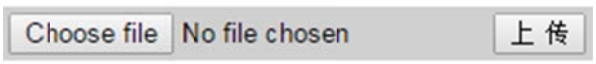
Choose a bin file to upgrade

Click Choose file button “ Choose file ” to choose a bin file which our company offered.

click “ 上 传 ” wait for about 20 seconds, if the operation of upload successfully, show as below:

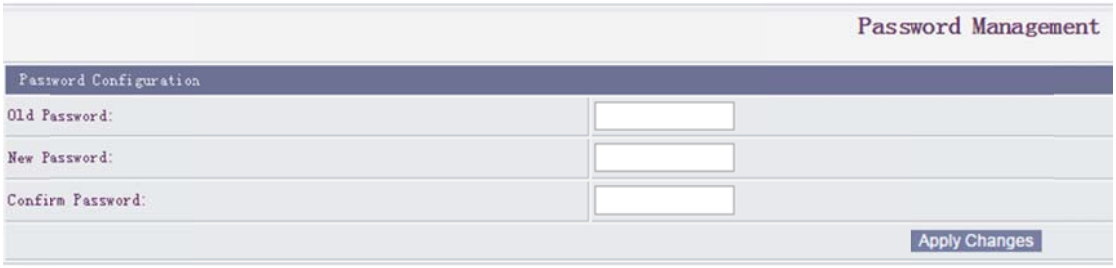
Click“ 返回 ” button, Firmware upgrade fish.

Click button” 重启 ”,reset the machine then execute the new program as follow:



4.9 password management

Click“password management” link change login in Password , show as follow



Enter old password and new password and confirm password in below window after click

“ Apply Changes ”Button

Note: Password length less than 10 characters.

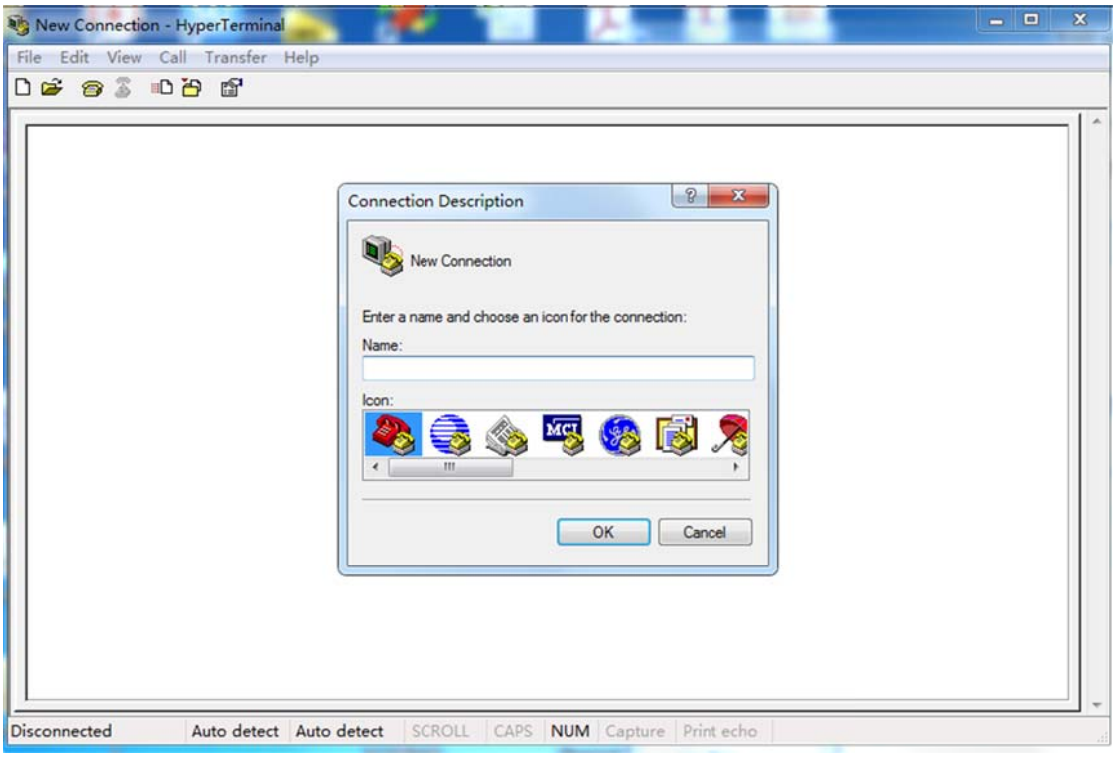
5 Firmware update and restore default settings

5.1 Firmware update by RS232 or RS485

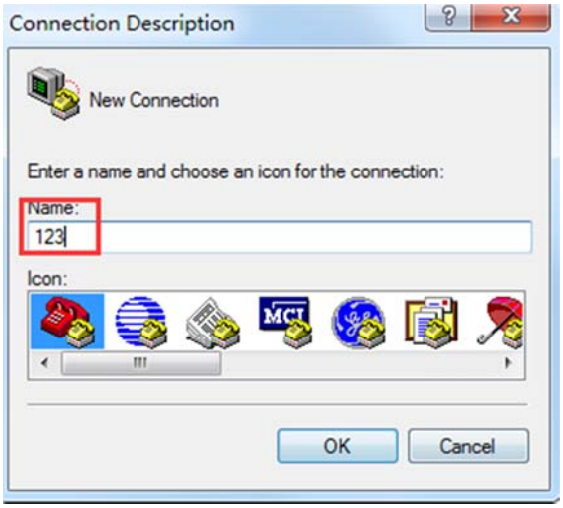
1. Make sure the reader and the host PC keep normal RS232/RS485 communication
2. Power off the machine, if it's in working status.
3. Create a Hyperterminal in your host PC.

The following steps show how to create Hyperterminal on Windows XP:

Step1: Open hyper terminal to configure the parameter as below

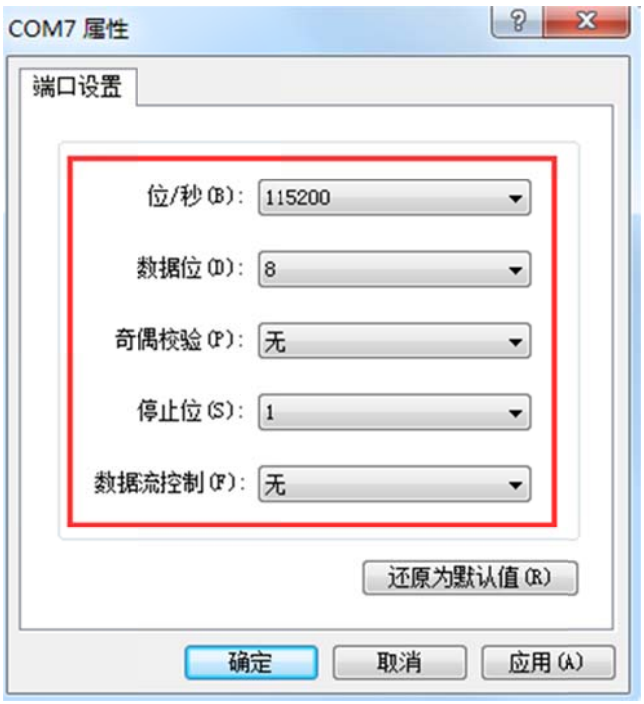


Step 2: Key in a "name" as you like, and then go to next step.

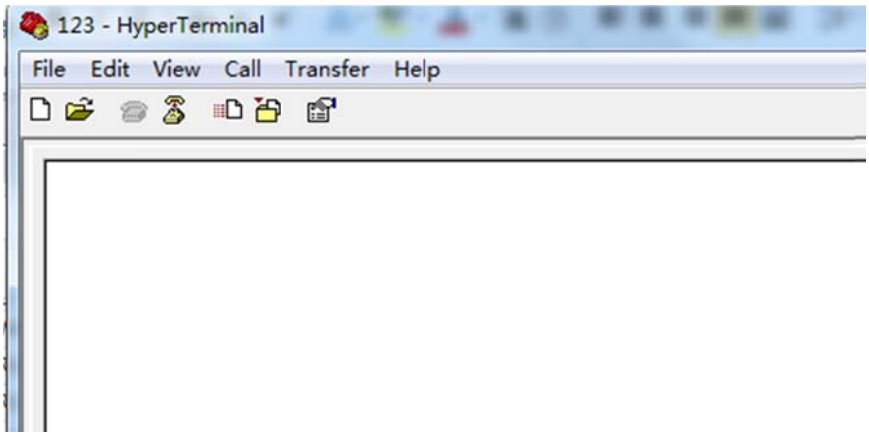


Step 3: Choose a COM port and then go to next step.

Step 4: Config the COM port as follow parameters

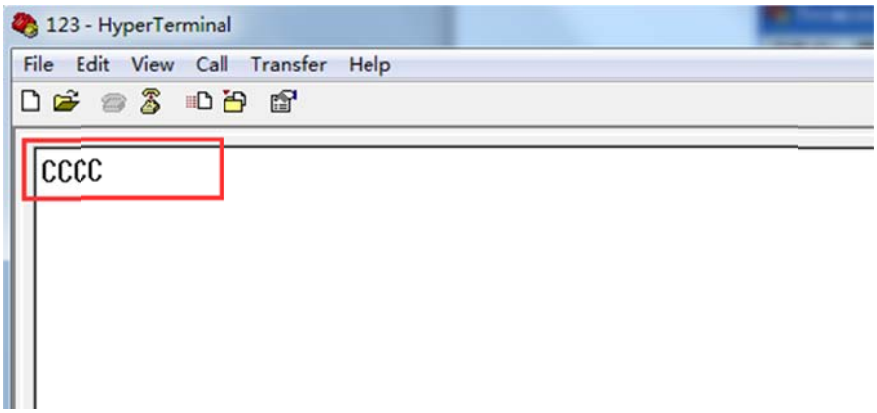


Step 5: The creating is finished after step 4. The page show as below:

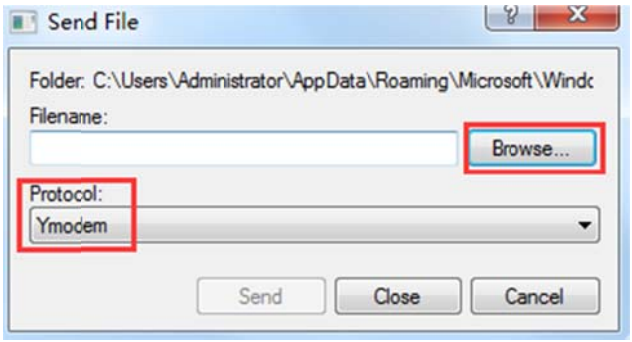


Step 6: Connect to the machine. Click the “Disconnect ➡ Connect ”, communicate with the machine via COM port as follow:

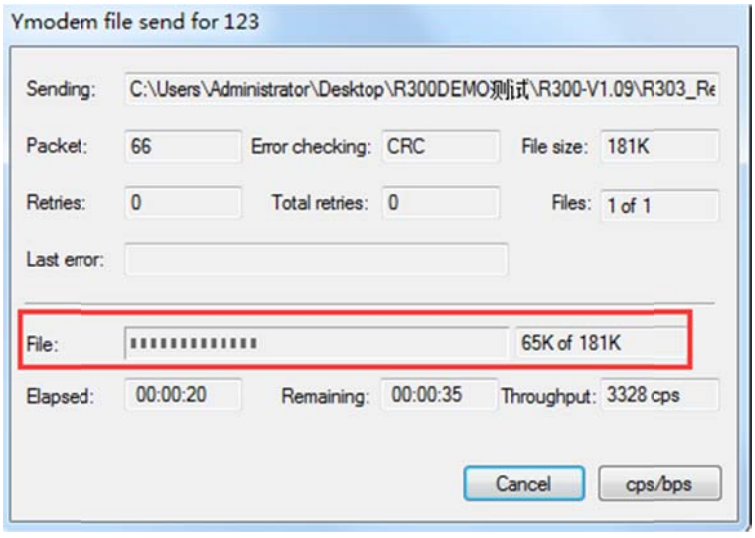
1. Press Key “0” on keypad of the machine, and don't loosen（with keyboard） or short circuit J4(1,2PIN)（without keyboard）
2. Power on the machine under the Key “0” pressed down.
3. After few seconds, machine LED will flicker and indicates to enter into upgrade mode successfully. The HyperTerminal will show like this:



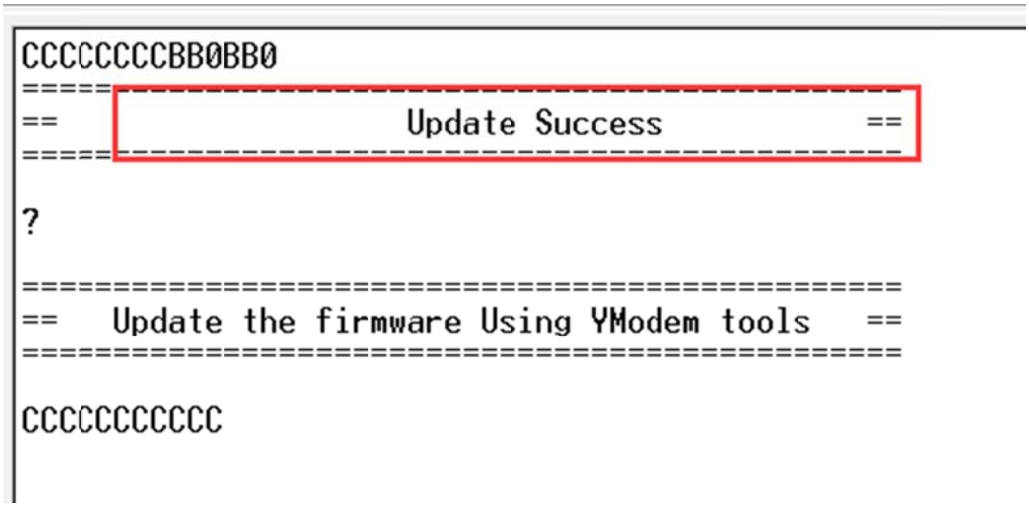
4. Select modern and choose a bin file which offered by XID



5. Transmitting



6. If the transmission succeed, the page and machine buzzer beep show as follow:



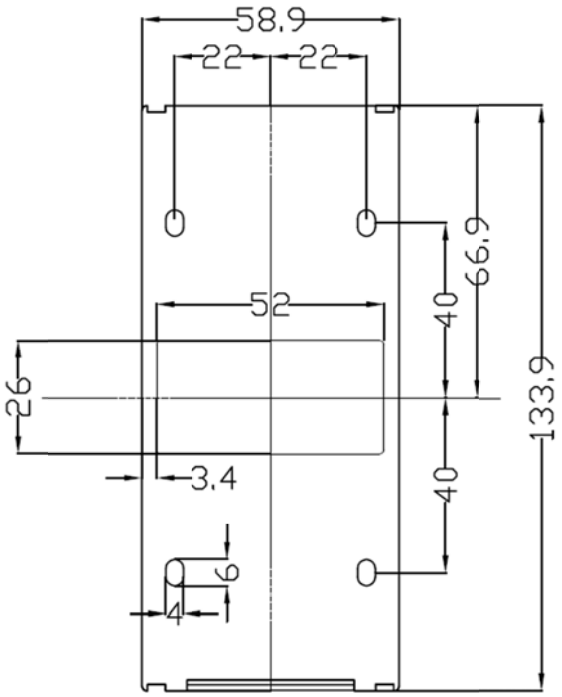
7. Cancel short circuit J4(1,2PIN) reset the machine(without keyboard need this step)

5.2 Restore factory defaults of web and wiegand config

1. Reader keep power on
2. Short circuit J3(2,3PIN)or(3,4PIN) after several seconds, Red and Green led light on
3. Cancel short circuit Jp3, read take a short beep

6 Installation

6.1 R300 Series installation



Note：Measurement Unit is millimeter.

Step 1: Drill four holes on the Installation location at mounting plate

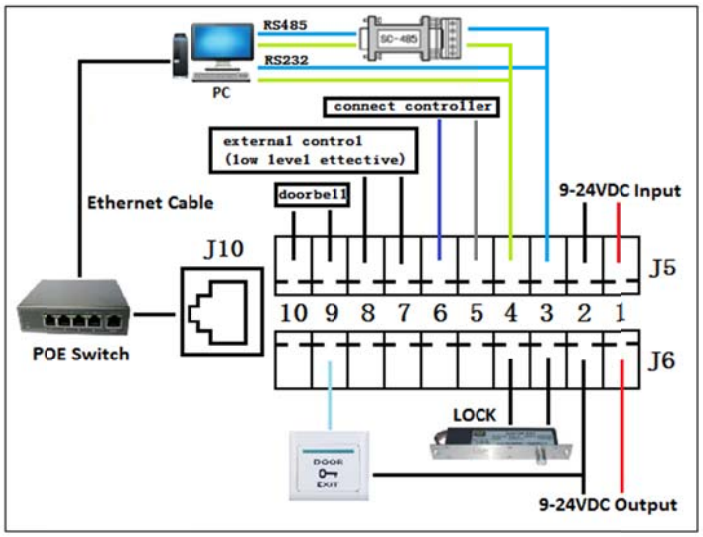
Step 2: Plug rubber stopper

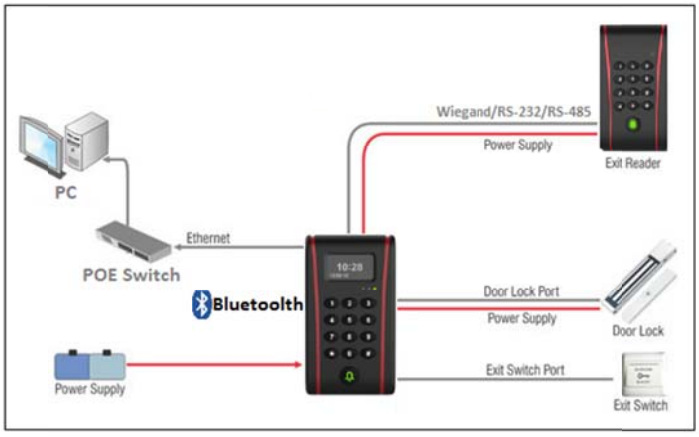
Step 3: Install mounting plate on the Installation location

Step 4: Twist four screws fixed mounting plate

Step 5: Attach the reader to mounting plate

7 Typical connection diagram





8 FAQ

When reader is not working normally, according to error code , users can get some information and do some trouble shooting. Common faults and rules out

SYSPTOM	ROOT CAUSE	RULE OUT
Reader is not power	Check if the cable connected well	Reconnect the cable well
Power-on the machine but the Red LED is not light	Communication the machine check whether enable the LED/Buzzer control (By external)option	Disable"LED/Buzzer control (By external)"option
Not read card	Not press "Run button before read card	In communication status, only press "Run" button in Host Demo,can read successfully

9 Technical support

We have professional technical support team to provide prompt, comprehensive support. If you have any technical questions,please contact technical support team.

Email: support@xid-tech.com

Skype: michael_28153

Latest documentation download is provided in "My Community" on our website using your authorized login in and password. The link http://www.xid-tech.com/

10 Repair and maintenance

Attention:

Only professional personnel can do repair work, and users should ensure the power off and make power plug in the monitoring range before any repair or maintenance.

For the correct use and prolong the service life, it is necessary for users to do regular repair and maintenance according to the specifications, or both the operation and reliability of the machine will be affected.

- Keep the machine and working area clean, avoid dust into the machine.
- Avoid machine used in extreme low or high temperature environment.
- Avoid all kinds of harmful gases, inflammable, explosive and corrosive chemicals, and should be far away from strong electromagnetic field.
- Avoid machine's operation procedures changed and other abnormal operations;

11 Store

Put the products in the original packaging box when users want to store them, and general storage period is six months. Warehouse environment temperature should be -10~ + 40, relative humidity 30% ~ 80%; No harmful gases, inflammable, explosive and corrosive chemicals existed,and must be away from strong electromagnetic field.

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