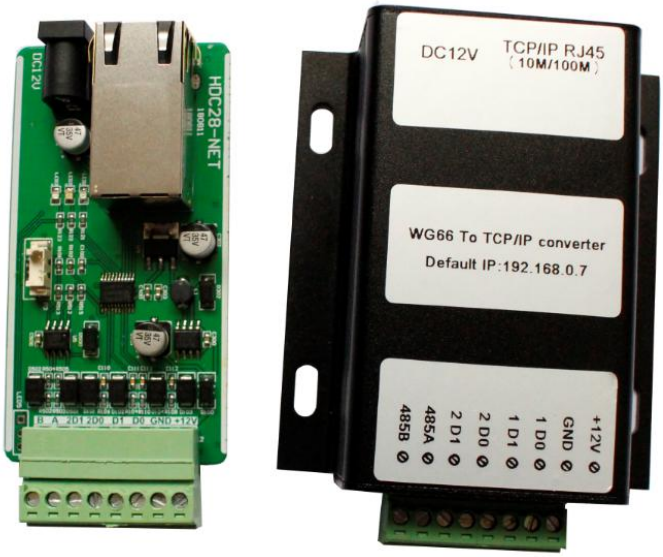
2 channel Wiegand to TCP/IP Communication Converter

User Manual

1. Introduction:

The converter design for where request transfer data between Wiegand and Ethernet communication. It support 2 channel of Wiegand data (26bit, 34bit and 66bit data, especially for Wiegand card number) to host via TCP/IP network, the default transfer format based on ASCII as standard and HEX for optional, it can also transfer data from RS485 to TCP/IP. The device can widely use for two door access control system.
For appearance, please refer to the picture:

Wiegang to Ethernet Converter



Here are the connection details about two interfaces:

For Wiegand interface, it adopt 8pin interface, details as below form:

PIN	Sign	Function	Remark
1	+12V	Power Input	DC12V+
2	GND	Ground	
3	1 WD0	1st channel Wiegand D0	
4	1 WD1	1st channel Wiegand D1	
5	2 WD0	2nd channel Wiegand D0	
6	2 WD1	2nd channel Wiegand D1	
7	485A	RS485 A	For optional
8	485B	RS485 B	For optional

For TCP/IP (RJ45) interface: it adopt 10M/100M self-adaption interface, support AUTO MDI/MDIX, so you can connect the converter with your computer direction, and also can testing direct. There also have a DC power supply interface (as picture).

Here is the detail definition:

PIN	Name	Description
1	TX+	Transceiver data+
2	TX-	Transceiver data-
3	RX+	Receive data+
4	NC	Not connected
5	NC	Not connected
6	RX-	Receive data-
7	n/c	Not connected
8	n/c	Not connected

The converter provides two power supplier interfaces, but can only choose any one of them for avoid any problem caused by voltage instability.

2. Technical Parameter

Size: 71mm x 25mm x 83mm
Weight: <100g, Color: black
Power supply: DC12V±5% 500mA for WG interface, DC5V for Ethernet (TTL)
Interface: Wiegand, RJ45 (10M/100M Ethernet), RS485
Wiegand interface: DC12V, GND, 1 D0, 1D1, 2 D0, 2 D1
Working currency: <130mA
Ethernet module: USR-K2 or USR-K3
Protocol: Wiegand, TCP/IP, RS485
Network protocol: support Ethernet, ARP, IP, UDP, TCP, etc.
Ethernet user name: admin, Password: admin, Default IP: 192.168.0.7
Network mode: TCP client\server (max for 4 Clients), UDP Client\Server, HTTDP Client
Network interface: RJ45 Ethernet (support 2KV Electromagnetic isolation)
Wiegand input format: 26bit, 34bit, 4bit, 8bit, or 66bit
Wiegand output format: 26bit 34bit, 8bit, or 66bit (can be set before ex-works)
Network input: ASCII (can be change to HEX when request)
Network output format: ASCII+0D+0A or HEX (for customized order)
Communication distance: max 100m (WG), max 1000m (RS485)
Power indicator: brightness when power on
Communication indicator: network set ok with green indicator
Working Temperature: -25~75℃
Storage Temperature: -40~105℃, Storage Humpty: 5%~95% RH

3. Communication Explain

3.1 Wiegand terminal output

Wiegand output support Wiegand 34bit as default. The converter get data from TCP/IP as the ASCII code from 0 to 4294967295, input max 4 bytes hex code.

The time interval of each byte is about 25ms, over 25ms, the converter start to transfer data as Wiegand 34bit, when converter only gets 1 byte of data, so we think it is a keypad input data, so it shall send out as Wiegand 8bit.

For example: converter get data: 31 32 33 34 37 38 and shall change these bytes to hex and send as Wiegand 34bit: 0001E256

Detail explain: Wiegand 34bit can send out hex max 4 bytes, so the max number of the converter input data change to hex is FFFFFFFF i.e. decimal: 4294967295 (total 10 digit, for ASCII that is 10 digit), so converter support the number from 0 to 4294967295 only.

If send as 26bit, so change to 255+65535 (FFFFFF), the number from 0 to 25565535.

The converter support digit max 4 bytes, consists of hex, if over the max number (based on Wiegand 34bit standard) , we shall intercept some part and send out.

For example: converter get data (ASCII) 31 32 33 34 35 36 37 38 39 30 31 32 33 34 35 total 15 bytes, change to hex is: 7048860DDF79, send out by Wiegand 34bit is 860DDF79, the upper part of the front (7048) shall intercept.

If only get one byte of data and delay over 25ms, so the converter think there is a keypad number, so the byte shall send out as Wiegand 8bits.

For example: converter get 32 (HEX), and over 25ms, so shall send out 32.

3.2 TCP/IP Ethernet output

The converter gets data from Wiegand interface and output as ASCII after decoding.

Format: (10 digit ASCII) +0D+0A

For example: get data 1E256 (HEX) from Wiegand interface so output data is:

30 30 30 30 31 32 33 34 37 38 0D 0A

If get only one byte of Wiegand data (think it is keypad input), so output only one byte, there have no suffix 0D 0A. Here have two cases for running:

(1) Get 4bit data, so send the byte as ASCII direct.

(2) Get 8bit data, so send the byte as original shape.

For example: Wiegand interface get 4bit data 3 so converter output ASCII 33, get 4bit dat A, so converter output ASCII 41;

If Wiegand get 8bit data 45 (hex), so converter send data as original shape: 45 (hex).

3.3 Wiegand input

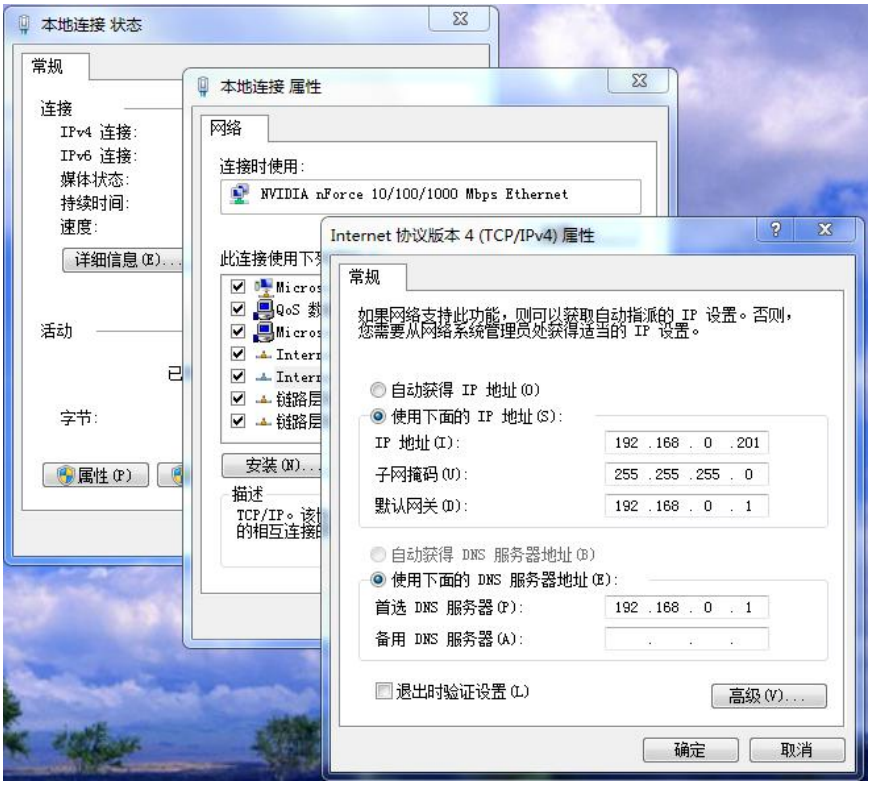
Support Wiegand 4bit, 8bit, 26bit, 34bit input

3.4 Wiegand output

Support Wiegand 8bit, 34bit input (8bit means keypad data)

If the transfer data more than 10 digital so we can provides Wiegand 66bit (it can max transfer 8 bytes (FF FF FF FF FF FF FF FF), max 19 digit numbers.

4. How to set computer network



When the converter working in LAN system, we must set it in same Subnet mask with computer like the picture, the converter has default IP address: 192.168.0.7, so here computer set Subnet mask as 0, and IP as 192.168.0.201; the converter have built-in web page, so can input IP address 192.168.0.7 in IE web browser. Later we can explain more details.

5. How to set converter communication with computer

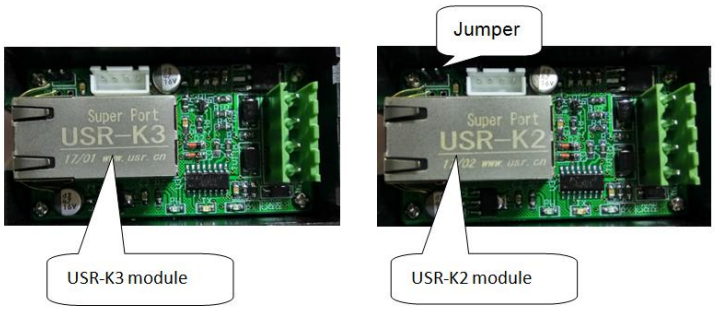
The device can config to support TCP (Serer/Client) mode.

Connect the converter to computer network via TCP/IP, the Wiegand interface connects with a Wiegand device (for example a Wiegand RFID card reader), check the internal mode is USR-K2 or USR-K3, power on (DC12V power supply), and select correct software, refer to the picture:

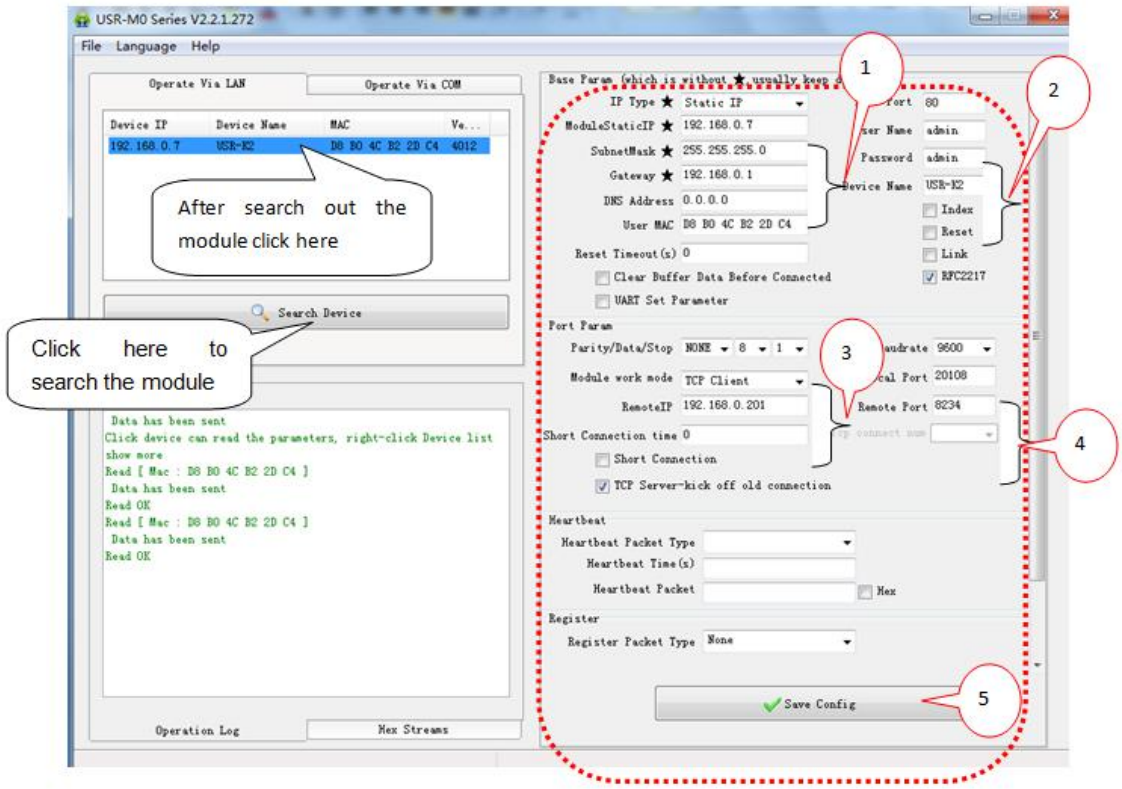
For USR-K2

for USR-K3

Here is the picture of the internal Ethernet module:



Now we start to set USR-K2 mode of converter, here is the software interface:



At right side we can set the TCP/IP network of the converter:

(1) Set IP address (Static IP), Subnet Mask, Gateway, default IP is: 192.16.0.7

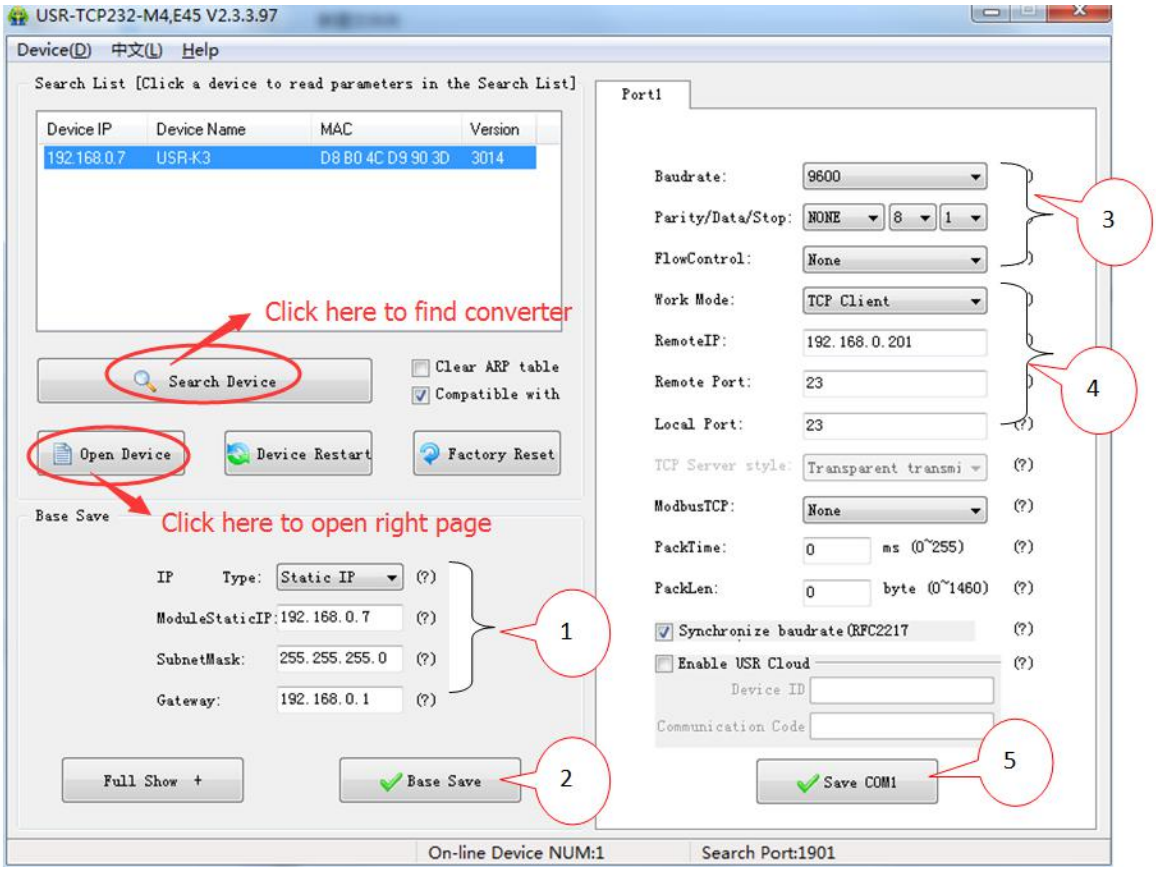
(2) Set user name and password

(3) Set port parameter, default: n, 8, 1, work mode: TCP Client, server IP (remote IP) 192.168.0.201 (can also input URL address when use HTTP).

(4) Set baud rate, local port, remote port, default set: 9600bps, 20108, 8234 (Attention: IP address can change, but Baud Rate cannot change, converter fix at 9600bps).

(5) Save config after finish all set.

And here is the step for set USR-K3 mode, refer to below picture:



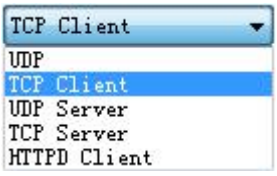
After search out the converter device, Click “Open Device” can see right side page.

(1) Set device IP address, subnet Mark, and gateway

(2) Click “Base Save” button for save.

(3) Please keep default set of the Baud rate (9600), and other setting, this is very important.

(4) Choose correct TCP/IP work mode, here have 5 modes for choose. Our default work mode is TCP Client, can also support TCP Server and HTTPD Client, UDP and UDP server (we don’t suggest to use these two mode since easy loss the data).



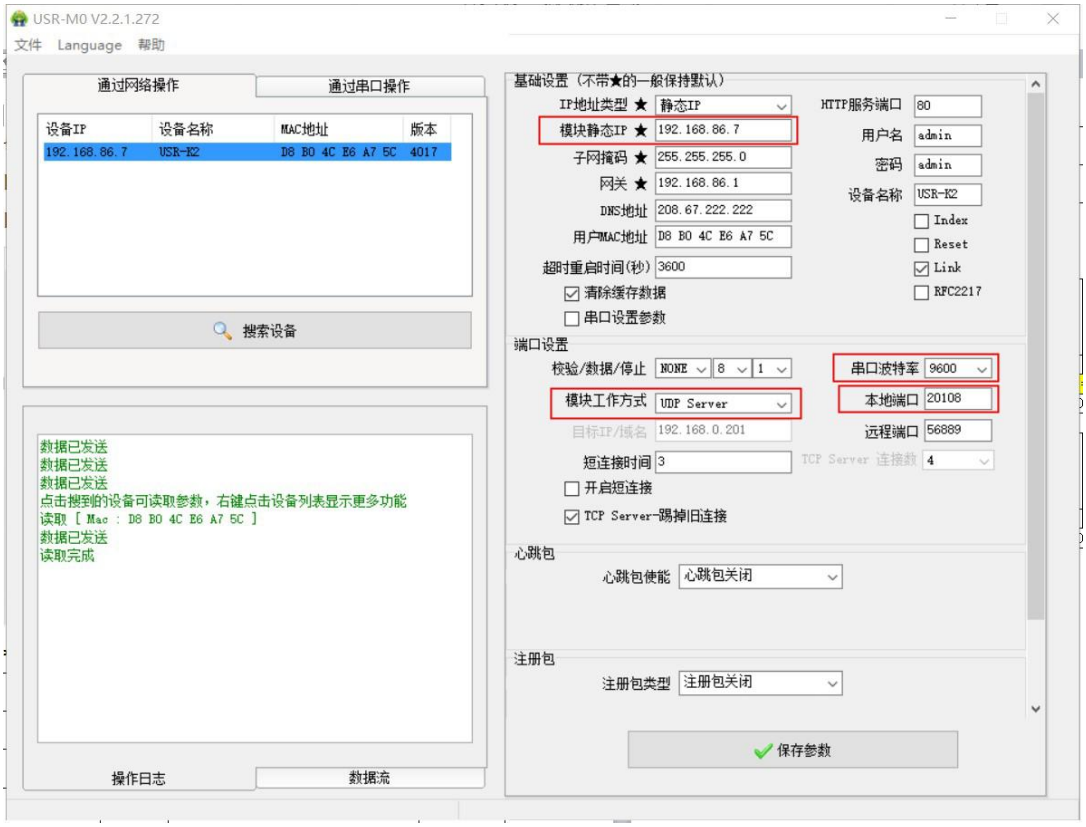
(Here are the work mode options)

How to set the work mode; please refer to our TCP module website:
http://www.usriot.com/products/ttl-uart-ethernet-module.html
Remote IP address can input URL (like: http://www.xxx.com) and WAN IP address.
Remote port is the relevant port from remote server.
Notice: when config these set must keep the converter and computer in same network (subnet Mark), consider the TCP to WG converter is a simply device, so we suggest it work in LAN system but suggest use for WAN and HTTP modes.
After set well the communication, the converter can transfer data from WG to TCP, or transfer data from TCP to WG.

It can also config the device support UDP working mode:

Refer to the picture:

Search the device by TCP/IP network, and set the IP address, and set working mode to UDP Server mode.



6. How to testing converter transfer data

The converter can transfer data with these modes:

WG to TCP

TCP to WG

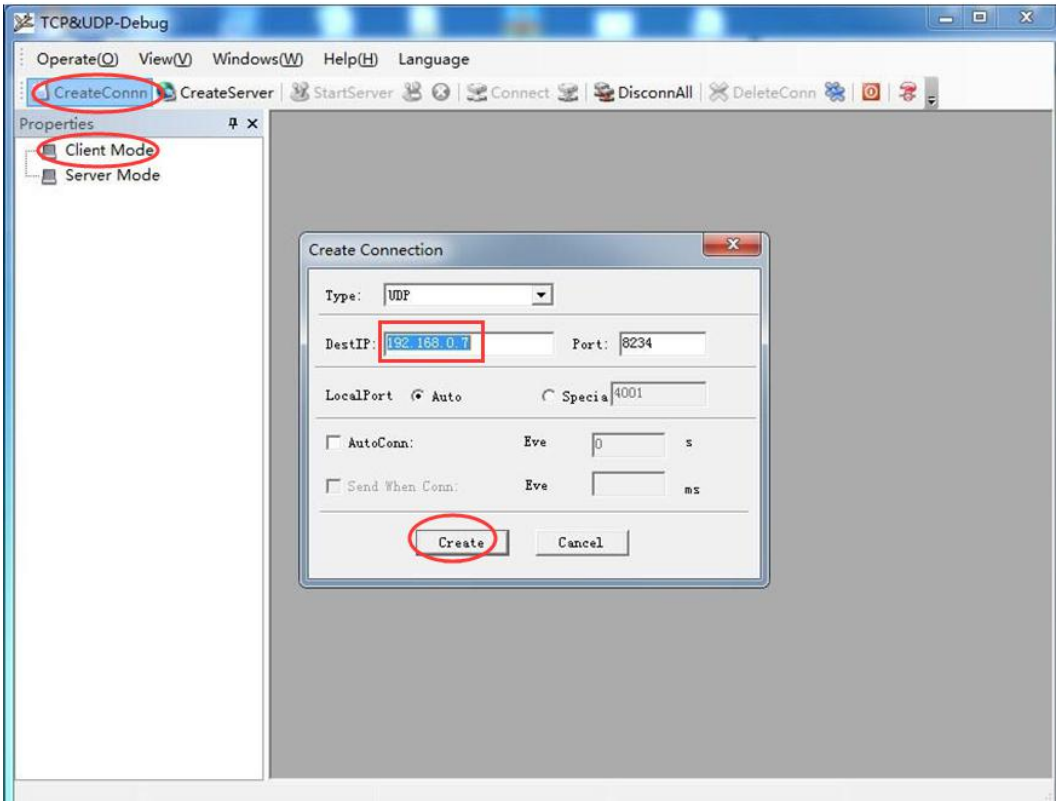
RS485 to TCP

Here is the step testing by UDP mode (Server/Client):

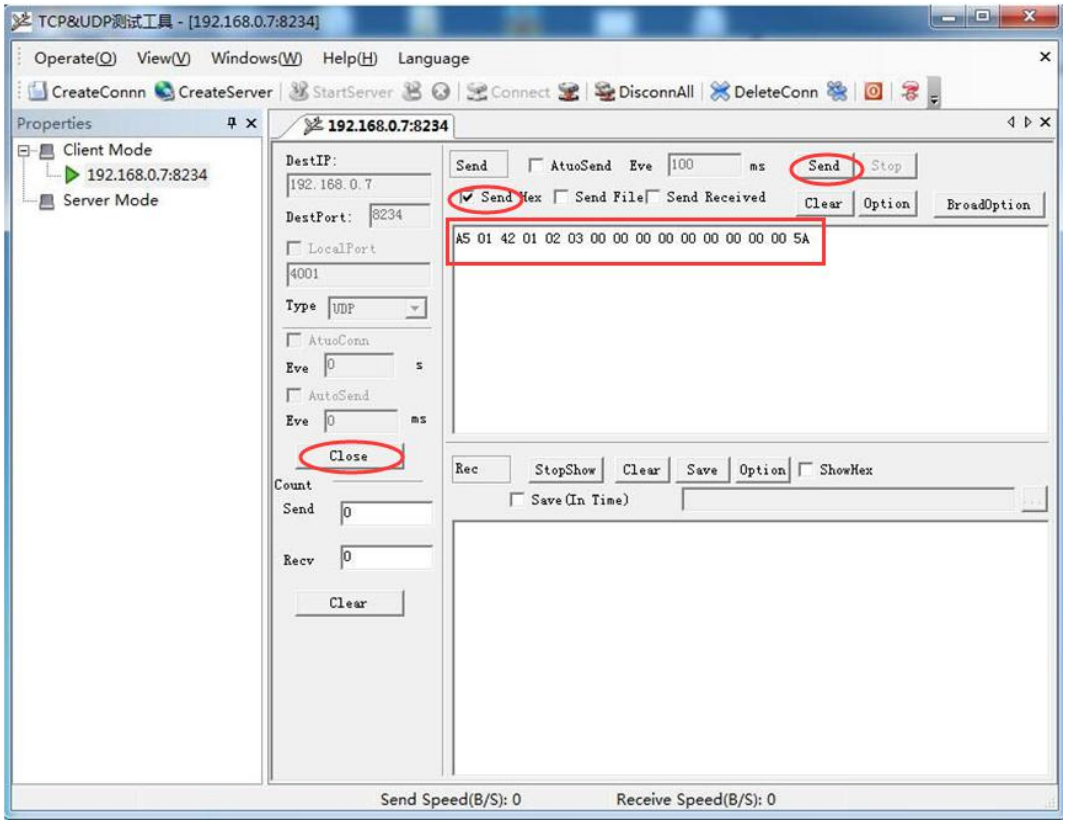
Install the UDP testing software.

Creat a connect by UDP as picture:

Click the buttons as red mark step by step, and input the correct device IP address.



Send the data from TCP/IP interface to Wiegand interface as below picture:



If you scan RFID card and output Wiegand data from Wiegand to TCP/IP interface, so you can see the data records in the bottom area.

7. Data transfer definition:

The device support send data from TCP/IP to 2 channel of Wiegand output, so must send data as our rule, here is the definition of the rules. Command total 16 bytes, structure as below:

Item	Byte number	Content	Remark
Data head	1	Fixed as 0xA5	
Command	1	01=1st channel of Wiegand 02=2nd channel of Wiegand	
WG format	1	1A=WG26, 22=WG34, 42=WG66	
HEX card number	12	12 byte of Wiegand number WG26: 3 bytes, WG34: 4 bytes WG66: 8 bytes	
Data end	1	Fixed as 0x5A	

Here following are examples of the command:

7.1). 1st channel of Wiegand interface data transfer

Send data from TCP/IP to Wiegand (26bit) channel 1

TCP/IP send	Data head	Channel	WG format	Card number	Data end
	0xA5	0x01	1A/22/42	01 02 03	0x5A
Remark	Send data from TCP/IP to WG26bit to channel 1				
Example	A5 01 1A 01 02 03 00 00 00 00 00 00 00 00 00 5A				

Send data from Wiegand channel 1 to TCP/IP:

WG send	Data head	Channel	Return	Other	Data end
	0xA5	0x01	Success as 00 Failed as FF	00	0x5A
For example	A5 01 00 00 00 00 00 00 00 00 00 00 00 00 00 5A When 1 WG get data from WG reader send card number to TCP/IP				

7.2). 2nd channel of Wiegand interface data transfer

Send data from TCP/IP to Wiegand (66bit) channel 2

TCP/IP send	Data head	Channel	WG format	Card number	Data end
	0xA5	0x02	1A/22/42	01 02 03	0x5A
Remark	Send data from TCP/IP to WG66bit to channel 1				
Example	A5 02 42 01 02 03 00 00 00 00 00 00 00 00 00 5A				

Send data from Wiegand channel 2 to TCP/IP:

WG send	Data head	Channel	Return	Other	Data end
	0xA5	0x02	Success as 00 Failed as FF	00	0x5A
For example	A5 02 00 00 00 00 00 00 00 00 00 00 00 00 00 5A When 2 WG get data from WG reader send card number to TCP/IP				