NETRFID Network RFID Reader Manual



Introduction

NETRFID is a card reader that based on TCP/IP network. NETRFID can easily connect Ethernet network (LAN, WAN, MAN). Installation is very easy. It meets the needs of Internet of things.

NETRFID has 3 versions which support different RFID Card.

- NETRFID-V1: 125Khz ID card
- NETRFID-V2: 13.56Mhz IC card, such as Mifare S50, S70, etc.
- NETRFID-V3: PROX CARD II, PROXKEY II, PROXCARD PLUS

Features

- 10/100M Ethernet interface, Support automatic polarity conversion (MDI/MDIX)
- Support Network protocol such as TCP Server, TCP Client, UDP, DHCP etc.
- Support multi-to-one visit in LAN
- Support internet and transmission between different subnets.
- Support command to drive the on-board buzzer
- Fast response to HID card, Real-time transmission
- Fully support HID and its compatible card
- Effective distance is larger than 5cm
- 5 V DC power supply, low power consumption less than 300 MA
- Working temperature -15 \sim 75 \mathcal{C} , Storage temperature -25 \sim 85 \mathcal{C}

Description interface

RJ45 integrates internal network filter and two LED state indicators. RJ45 internal pins is as shown below.



Pin Number	Description
1	TX+
2	TX-
3	RX+
6	RX-

Command

There are two commands in all. The usage is pretty easy. All the data in the command are in Hex.

CMD0

Drive the buzzer (CMD0 Command has no responding data)

CMD0	A buzzer length voice	Reserved	Reserved	
0x00	Ν	OXFF	OXFF	

N: Specify the time length of the voice, with value between $0^{\sim}255$.

Example: send **00 01 FF FF** command, Drive a buzzer with a short sound.

CMD1

Issue connection and get the reader's ID numbers (Every card reader has an unique ID)

CMD1	Reserves	Reserves	Reserves
0x01	OXFF	OXFF	OXFF

This command will do the following things:

- 1. CMD1 can read the unique reader ID. For example, sending **01 FF FF FF** will get the unique ID in reply.
- 2. Change the client ID which will receive the card number. While the card reader works in multi-one mode (UDP Server mode) in LAN, in fact the command CMD1 sends localhost's ip and port to the card reader. So the card read now knows next time where it should send the data back. Once it gets cards' number, it will send the data to the client who sent CMD1 command most recently.

CMD1 Response

CMD1	The 2nd bytes	The 3rd bytes	The 4th bytes	The 5th bytes	The 6th bytes
0x01	ID0	ID1	ID2	ID3	ID4
The 2nd byte to 6th bytes is a 5-bytes reader's ID in hex.			CO		
Data Fo	rmat			\mathcal{O}^{*}	

Each time while you got the card number from the reader module, it is in the following format:

STX(0x02)	DATA(8 or 10HEX)	CR(0x0D)	LF(0x0A)	ETX(0x03)	

DATA field contains 8 or 10 valid HEX numbers. It is the card number.

TCP Test Tool 3.0	
File Edit Clear Help	
Client IP Address/Name 192.168.1.118 Elaps Time 00:09:37 Reset Connected	Server Current Connections 0/250 192.168.1.101/12345 Set Listening Port 12345 Bind
Edit/Send Data	Edit/Send Data
Enter data to send	Enter data to send
ASCII Hex Line Feed Carriage Return Auto Send Send every 1 sec. Clear Send Edit/Data Log 02[34 39 30 30 37 33 32 37 30 42]0D 0A 03	ASCII Hex Line Feed Carriage Return Auto Send Send every Send every Edit/Data Log
Display data as: ASCII Binary Decimal Hex HEX Data Log	Display data as: ASCII Binary Decimal Hex HEX Data Log
Comparison Compari	Display Sound Clear Log

Configuring the Reader

Default setting:

- IP Address: 192.168.1.18
- Gateways: 192.168.1.1
- Subnet mask: 255.255.255.0
- Work mode: TCP Server
- Port: 50000

We need a tool to configure this reader. You could download it here.

Step 1

Power on the module and connect it with your PC or router with an RJ-45 network cable. You will hear a long buzzer. After that, the reader is ready. The device's default IP is 192.168.1.18. So if you connect it with router, make sure this IP address is valid in your LAN. In this example, you are supposed to connect it with your PC. On windows 7 OS, set the localhost IP as 192.168.1.17.

In	nternet Protocol Version 4 (TCP/IPv	14) Properties
	General	
	You can get IP settings assigned au this capability. Otherwise, you need for the appropriate IP settings.	Itomatically if your network supports d to ask your network administrator
	Obtain an IP address automat	ically
	Ouse the following IP address:	
	IP address:	192.168.1.17
	Subnet mask:	255 . 255 . 255 . 0
	Default gateway:	192 . 168 . 1 . 1
	 Obtain DNS server address au Use the following DNS server a 	addresses:
	Preferred DNS server:	· · ·
	Alternate DNS server:	· · ·
	Validate settings upon exit	Advanced
		OK Cancel

You could try to ping the reader's IP from your PC to check if the connection works.



Start the software and enable **ENABLE Operate**. Then click **SCAN** button.

RFID&IC network card reader test soft	warewww.elechouse.com	
Help(H)		
DeviceIP list MAC	CARD TYPE choice D ID IC ▼ Device Setting ■ Local IP: 192 168 0 18 Subnet: 255 255 0 18 Gateway: 192 168 0 1 Peer IP: 192 168 0 88 Port: 50000 ▼ • Mode: TCP Serve ▼ ✓ Keep Static C DHCP Configuration status 192 168	CDNFIG choose FF FF FF FF FF essage
	▼ ENABLE Operate 192.168	3. 1. 101
☐ direct ip 192 168 0 255	SCAN Connect Read Config	3
Device Connection	CARD Message	
🔶 selected 🔘 Not select	Device ID	
Search Device	CARD ID	

Step 3

Click the area where shows the IP and MAC address

RFID&IC network card reader test softw	arewww.elechouse.com	
Help(H)		
DeviceIP list MAC 192.168.1.18 00-90-C2-CA-10-B9	CARD TYPE choice ID IC ▼ Device Setting ▼ Local IP: 132 168 0 18 Subnet: 255 255 0 192 168 0 1 Gateway: 192 168 0 1 192 168 0 88 Port: 50000 ▼ ▼ Mode: TCP Serve ▼ Keep © Static C DUCP C Curp C Curp	D CONFIG Choose FF FF FF FF FF Message Please first choose device IP, configuration
	configuration configuration st.	atus completed
direct ip 192 168 0 255	SCAN Connect Read (Config
Device Connection	CARD Message	
😑 selected 🔘 Not select	Device ID	
Search Device	CARD ID	0

Click the **Connect** button.

Help(H)						
DeviceIP list MAC		E choi	ce—			ID CONFIG
92.168.1.18 00-90-C2-CA-10-B9	ID	IC				Choose FF FF FF FF FF
	Device Settin	g				 Message
	Local IP:	192	168	0	18	Please first choose
	Subnet:	255	255	255	0	device IP,
	Gateway:	192	168	0	1	Contracton
	Peer IP:	192	168	0	88	
		5000		ĩ		
	Port:	TCD	0 •]		
	Mode: — Keen	proes a S	Static	-		
	Alived	•	P	01	OHCP	
	- configuration			config	uration c	statuo
		n		s	earch	completed
	V ENABLE	Upera				
direct ip 192 168 0 255	SCAN		Connec	t	Read	l Config
- Device Connection	CARD Messa	ge				
🔴 selected 🔘 Not select	Device	ID	Γ			
Search Device	CARD	D	Γ			(

Step 5

Now we connect to the reader successfully. Change the IP, Gateway address, Port number and Working mode.

RFID&IC network card reader test soft Help(H)	twarewww.elechouse.com	
DeviceIP list MAC 192.168.1.18 00-90-C2-CA-10-89	CARD TYPE choice ID CONFIG	
	Device Setting Message Local IP: 192 168 1 118 Subnet: 255 255 0 device IP, configuration Gateway: 132 168 1 1 Peer IP: 192 168 0 88 Port: 50000 ▼	
	configuration configuration status ✓ ENABLE Operate	
☐ direct ip 192 168 0 255	SCAN Connect Read Config	
Device Connection	CARD Message	
selected O Not select	Device ID	
Search Device	CARD ID	

Parameter Name	Description
Local IP	The reader module's IP address
Subnet	Must be the same with your PC's
Gateway	Must be the same with your PC's
Peer IP	While Mode is set as TCP Client or UDP Client , you can change this parameter. It is the remote server's IP address.
Mode	 There are 4 kinds of working mode: TCP Server, TCP Client, UDP Sever and UDP Client. TCP Server: in this mode, TCP clients to visit it for data. TCP Client: in this mode, we could configure remote server IP and port to make connection with remote server. UDP Server: in this mode, the card reader could respond to many clients. A client sends CMD1 command to the card reader. And the reader will record the IP and Port of the latest CMD1 sender. While it gets card number, it always sends the number to that IP and Port number. UDP Client: this mode is kinda like the TCP client. We could configure remote server IP and port to make connection with remote server.
Keep Alived	TCP heartbeat. We suggest that enable the Keep Alive choice. This will make sure that the link will

	be re-connected if illegal disconnect took place.
Static IP/DHCP	 Static IP: the network parameters such as IP, subnet and Gateway address, are assigned by hand. The setting above is valid while we choose this option. DHCP: the network parameters such as IP, subnet and Gateway address, are assigned by DHCP server, for example, a router. Usually router supports DHCP. While you connect it with routers, you could choose this option.
ID CONFIG	This option could choose the reader's unique ID. Enable it and assign new ID if you want to change it.
Step 6	

Click Read Config

RFID&IC network card reader test softw Help(H)	warewww.elechouse.com	
DeviceIP list MAC 192.168.1.18 00-90-C2-CA-10-89	CARD TYPE choice ID IC Device Setting Local IP: 192 168 1 118 Subnet: 255 255 255 0 Gateway: 192 168 1 1 Peer IP: 192 168 0 88 Port: 50000 Mode: TCP Serve Keep Static ID CONFIG Choose FF FF FF FF FF Please first choose device IP, configuration	
	configuration configuration status Image: ENABLE Operate search completed	
☐ direct ip 192 168 0 255	SCAN CONFIG Read Config	
Device Connection	CARD Message	
selected Not select	Device ID	
Search Device	CARD ID	2

Step 7

Click CONFIG

RFID&IC network card reader test softw Help(H)	warewww.elechouse.com
DeviceIP list MAC 192.1681.18 00:30-C2:CA-10:89	CARD TYPE choice ID CONFIG DDIC ▼ Device Setting Choose Local IP: 192 255 255 Gateway: 192 192 168 192 168 192 168 192 168 192 168 192 168 Peer IP: 192 192 168 Port 50000 ▼ Mode: TCP Serve ▼ W Keep ✓ Keep ✓ Static PPOE Disable
	Message configuration status Image: ENABLE Operate search completed
☐ direct ip 192 168 0 255 Device Connection	SCAN CONFIG Read Config
 selected Not select Search Device 	Device ID CARD ID

Configuration is done. This card reader has FLASH to save configuration. So even powered off, the setting will not be lost.

Test

We will show examples of testing with 2 software tools: ELECHOUSE RFID Testing Tool and TCP Test Tool.

ELECHOUSE RFID Testing Tool	. 0.

Step 1

Restart the tool, and click **Search Device** button.

RFID&IC network card reader test soft	warewww.elechouse.com
Help(H)	
DeviceIP list MAC	CARD TYPE choice ID CONFIG ID IC ID CONFIG Device Setting Image: Construction Local IP: 132 168 0 Subnet: 255 255 0 Gateway: 192 168 0 18 Port: 192 168 0 18 Port: 50000 Image: Configuration Image: Configuration Configuration status
	ENABLE Operate 192. 168. 1. 101
direct ip 192 168 0 255 Device Connection	SCAN Connect Read Config
 selected Not select Search Device 	CARD ID

You will get the warning prompt. Just click **OK**.



Step 2



RFID&IC network card reader test soft	warewww.elechouse.com
Help(H)	
DeviceTP_listMAC 192168.1.18 00.90-C2-CA-10-89	CARD TYPE choice ID IC Device Setting In CONFIG Local IP: 192 255 255 Gateway: 192 192 168 Peer IP: 192 192 168 Port: 50000 ▼ Mode: TCP Serve ▼ IF Alived Cataus configuration configuration status Configuration search completed
☐ direct ip 192 168 0 255	SCAN Connect Read Config
Device Connection	CARD Message
 selected Not select Search Device 	

Then you will connect the device successfully.

Help(H)		
DeviceIP list MAC 1921581.18 00:90-C2-CA-10-89	CARD TYPE choice ID CONFIG ID IC ID CONFIG Device Setting In Conservation Local IP: 192 168 18 Subnet: 255 255 0 0 Gateway: 192 168 0 1 Peer IP: 192 168 0 1 Mode: TCP Serve Mode: ICP Serve IV Keep © Static DHCP 0 0	FF FF FF FF FF select need on of the nt IP, and then rol
	configuration configuration status	
□ direct ip 192 168 0 255	SCAN Connect Read Config	
Device Connection selected Not select Search Device	CARD Message Device ID CARD ID CARD ID	•

Put an RFID card on the reader. You will hear the buzzer and get the card number.

RFID&IC network card reader test softwork (Help(H))	warewww.elechouse.com
DeviceIP list MAC 192.168.1.18 00-90-C2-CA-10-89	CARD TYPE choice ID IC Device Setting Local IP: 192 168 0 18 Subnet: 255 255 255 0 Gateway: 192 168 0 1 Peer IP: 192 168 0 88 Port: 50000 ▼ Mode: TCP Serve ▼ Keep ← Static IP ← DHCP
	configuration configuration status ENABLE Operate search completed
direct ip 192 168 0 255	SCAN Connect Read Config
Device Connection	CARD Message
selected Not select	Device ID 11-11-11-11
Search Device	CARD ID 490073270B

TCP Test Tool

We use <u>TCP Test Tool</u> to test the **TCP Server** mode and **TCP Client** mode. You could also use <u>UDP Test Tool</u> to test the **UDP Server** mode and **UDP Client** mode. Since the test is similar, here we only show how to test with TCP Test Tool.

Test TCP Server			
Step 1	7		

Download <u>TCP Test Tool</u> and install it. Then open it.

TCP Test Tool 3.0	X
File Edit Clear Help	
Client Port IP Address/Name Port I2345 Connect Elaps Time Connection Status 00:00:00 Reset Idle	ServerListening on Current Connections 0/250Listening on 192.168.1.102/12345 Set Listening Port 12345Bind
Edit/Send Data Enter data to send	Edit/Send Data Enter data to send

Here, the **Client** and **Server** (underlined by red line) mean you PC role. Here we test the card reader's **TCP Server** mode first.

File Edit Clear Help	
Client	Current Connections 0/250 Listening on 192.168.1.102/12345
Elaps Time Connection Status O0:00:13 Reset Connected	Set Listening Port
- Edit/Send Data	Edit/Send Data
Enter data to send	Enter data to send
💿 ASCII 💿 Hex 👘 Line Feed 🔲 Carriage Retur	ASCII Hex I ine Feed Carriage Beturn

Configure your card reader in TCP Server mode as description above. Enter the reader's IP and Port number, and lick **Connect**. *Here my card reader's IP is 192.168.1.118, Port number is 50000. So I fill it in the following way:*

Step 3

Put the card on the reader. Then you will get the card number in the software.



Send CMD0 to drive the buzzer in the reader module. Click **Hex** and enter **00 01 ff ff**, click **Send**, and then the buzzer will sound once.

lient	Server
IP Address/Name Port Disconnect I92.168.1.118 Connection Status 00:05:34 Reset Connected	Current Connections 0/250 Listening on 192.168.1.102/12345 Set Listening Port 12345 Bind
Edit/Send Data	Edit/Send Data
00 01 ff ff	Enter data to send
ASCII Hex Line Feed Carriage Return	ASCII Hex Line Feed Cantage Return
Auto Send Send every 1 sec. Clear Send	Auto Send Send every Send every Clear Send
Edit/Data Log	– Edit/Data Log –
490073270B	
Display data as: ASCII Binary Decimal Hex 	Display data as: ASCII Binary Decimal Hex
HEX Data Log	HEX Data Log
<- {192.168.1.118/50000} 02 34 39 30 30 37 33 32 37 30 42 0 <- {192.168.1.118/50000} 02 30 33 30 30 38 36 30 36 31 44 0	

Send CMD1 to get the reader's unique ID. Click **Hex** and enter **01** *ff ff ff*, click **Send**, and then you will receive the ID.

TCP Test Tool 3.0		
File Edit Clear Help		
Client Port IP Address/Name Fort 192.168.1.118 50000 Elaps Time Connection Status 00:13:21 Reset	Server Current Connections 0/250 Listening on 192.168.1.102/12345 Set Listening Port 12345 Bind	
Edit/Send Data	Edit/Send Data	
01###	Enter data to send	
ASCII Hex Line Feed Carriage Return Auto Send Send every 1 sec. Clear Send	ASCII Hex Line Feed Carriage Return Auto Send Send every Send every Clear Send	
Edit/Data Log	Edit/Data Log	
01 11 11 11 11 11	· · · · · · · · · · · · · · · · · · ·	
Display data as: 🔘 ASCII 🔘 Binary 🔘 Decimal <u>@ Hex</u>	Display data as: (a) ASCII (C) Binary (C) Decimal (C) Hex	
- HEX Data Log	HEX Data Log	
<pre>< {192.168.1.118/50000} 02 34 39 30 30 37 33 32 37 30 42 0 < {192.168.1.118/50000} 02 30 33 30 30 38 36 30 36 31 44 0 > {192.168.1.118} 00 01 FF FF > {192.168.1.118} 01 FF FF </pre>		

Test Client Server

Here use your PC as TCP server. In Command Prompt, enter command ipconfig to find your PC IP.



My PC IP is 192.168.1.102.

Step 2

Configure the reader to Client Server mode.

RFID&IC network card reader test softw Help(H)	vare
DeviceIP list MAC 1921681118 00-90-C2-CA-10-89	CARD TYPE choice ID IC → IP 地址信息 Local IP: 192 168 1 118 Subnet: 255 255 0 Gateway: 192 168 1 102 Port: 50000 → workway: TCP Client → Keep ⓒ Static IP ◯ UTL P Static IP ◯ UTL
■ direct ip 192 168 0 255 - 设备控制方式 ● selected ● Not select ● Connection device	configuration configuration status Image: ENABLE Operate search completed SCAN CONFIG Read Config CARD Message Device ID Operate CARD ID Operate Operate

Step 3

Start TCP Test Tool and configure it. Set the Port number to 50000, and the click Bind.

www.elechouse.com

TCP Test Tool 3.0	X
File Edit Clear Help	
Client Port I2345 Connect Icalhost Connection Status Idle	Server
Edit/Send Data	Edit/Send Data

Soon you could find a connection from the reader.

TCP Test Tool 3.0	
IP Address/Name Port Iocalhost 12345 Elaps Time Connection Status 00:00:00 Reset	Server Listening on [1] 192.168.1.118/51093 192.168.1.102/50000 Set Listening Port 50000
Edit/Send Data	Enter data to send

Step 4

Put the card on the reader module and you will get the card ID in TCP Test Tool.

🖄 TCP Test Tool 3.0	
File Edit Clear Help	
Client Port localhost 2345 Connect	Server Listening on Current connections 1/250 192.168.1.102/50000 [1] 192.168.1.118/51093 192.168.1.102/50000
Elaps Time Connection Status O0:00:00 Reset Idle	Set Listening Port 50000 Bind
Edit/Send Data	Edit/Send Data
Enter data to send	Enter data to send
Auto Send Send every Send Send Send Send	Auto Send Send every Send every Send Send Send Send
Edit/Data Log	Edit/Data Log
· · ·	1 ^{490073270B}
Display data as: ASCII Binary Decimal Hex	Display data as: (i) ASCII (ii) Binary (iii) Decimal (iii) Hex
HEX Data Log	- HEX Data Log
	< {192.168.1.118/51093} 02 34 39 30 30 37 33 32 37 30 42 0

Disclaimer and Revisions

The information in this document may change without notice. If you have any problem about it, please visit <u>www.elechouse.com</u> or email to <u>service@elechouse.com</u>.

Revision History

Rev.	Date	Author	Description
А	Jun. 10 th , 2012	Wilson	Initial version