

LT-DS8116 User's Guide V2.3

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LT-DS8116 is an industrial-grade, high-performance, 16-channel UHF RFID reading and writing equipment. It is designed with all-metal shell, and has excellent durability and heat dissipation performance. The product integrates a wealth of communication interfaces, including USB, RSS-232, Ethernet, wireless WIFI(optional) and so on.

LT-DS8116 adopts carrier cancellation technology and a new anti-collision algorithm, the application of external watchdog and network heartbeat packet, the lightning protection and surge protection design of circuit, which makes its reading and writing performance excellent, stable and reliable, and has strong anti-interference ability. It can completely meet the needs of various environments.

1. Basic Parameter Setting

1.1 Connect Reader

<1> RS232 connection.

Select connect type

Connect Type

RS232 TCP/IP

Select Port Port: (According to the actually Select)

And baud rate Baud rate: (default) , click

If success , can see

<2>TCP/IP connection.

Select connect type

TCP/IP

RS232 TCP/IP

Input reader ip address and port:

IP:

Port:

Click

1.2 Parameter Setting:

Reader address

(1) the new reader address to set.

This address can't be 0xFF. If set 0xFF, reader will return error information.

Power

(2) set and save power

configuration.

(3)

Region

 Chinese band1
 Chinese band2
 US band
 Korean band
 EU band

 Single

select the reader's band, different band, the frequency is different.

(4) Set reader working

Min Frequency and Max Frequency. In different places, the radio requires the rule to be different. Users can follow the local situation and choose to read more sensitive frequency range of the card. In single frequency point operation, only need to set two frequencies to the same value. In frequency hopping operation, only need to set two frequencies to the different value.

RS232/485 baud rate

(5) demo software start run,

default use the baud rate 57600 to open COM port, reader power on, reader baud rate default is 57600. After change the baud rate, reader use the new baud rate until power off. Close port and open port, the baud rate no change. The demo software will use the new baud rate, until close the demo software.

Beep

 Open
 Close

(6) , Set beep open or close

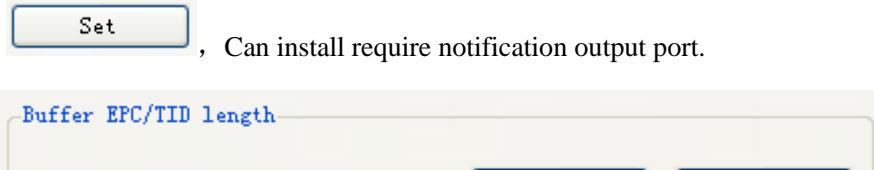
Reader serial number

(7) , click can get reader's serial number.

Set notification pulse output

 OUT1
 OUT2
 OUT3
 OUT4

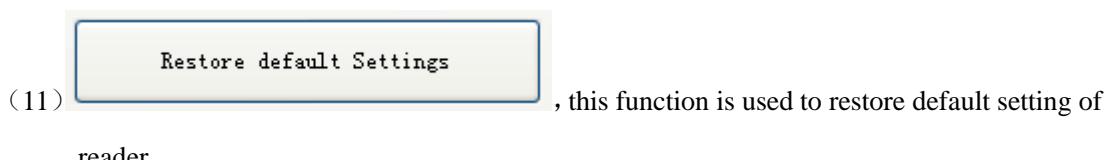
(8) , select output port, click



(9) , this function is used to get or set EPC/TID length on buffer tag.



(10) , this function is used to get reader's serial number.



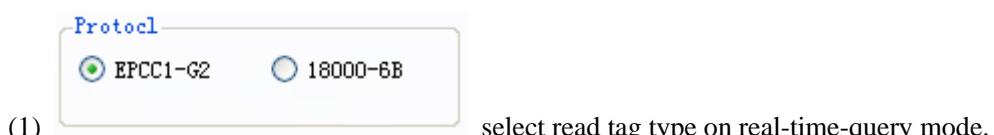
(11) , this function is used to restore default setting of reader.



(12) , this function is used to get reader's information.

2. Work mode Setting

2.1 Real time inventory Setting:



(1) select read tag type on real-time-query mode.



select read pulse time on real-time-query mode.



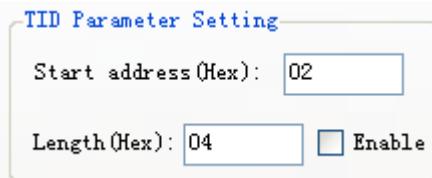
Select tag filter time, if select 0 is not filter.



Select Q and Session on real-time-query mode.
When Session is AUTO, only effective with EPC query.



conditions on real-time-query mode, if you want it effective, you should check **Enable**.



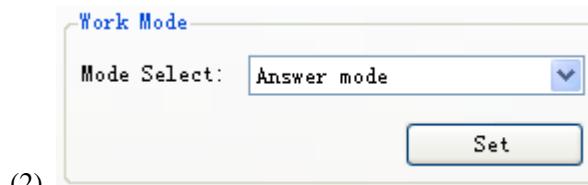
Set query TID parameter on real-time-query mode,

if you want it effective, you should check **Enable**.

Set Parameter

Get Parameter

set parameter with you select condition, get reader parameter on real-time-query mode.



Set reader work mode, if it set to

Auto real-time query mode

, we can get data by page "AUTO Real time".

3. The Necessary Knowledge

3.1 EPCC1G2 tag memory

Tag memory divided into four storage areas, each storage area can be made up of one or more memory words. The four storage areas:

EPC areas (EPC): Store the area of EPC number, this module stipulates it can store 15 word EPC number. Can read and can write.

TID areas (TID): Store ID number established by the tag production firm. There are 4 words and 8 words two kinds of ID numbers at present. Can read and not can write.

User areas (User): This area of different manufacturers is different. There is no user area in G2 tag of Inpinj Company. There are 28 words in Philips Company. Can read and can write.

Password areas (Password): The first two words is kill password, the last two words is access password. Can read and can write.

Can write protect in four storage areas. It means this area is never writeable or not writeable under the non-safe state; only password area can set unreadable.

3.2 18000-6B tag

6B tag has a memory space, the minimum 8 bytes (byte 0- 7) is UID of the tag, and can't

be rewritten. Following byte all can be rewritten, can be locked too, but once locking, can't rewrite again, can't unblock either.

3.3 Data display (tag ID, passwords, memory data is display in 16 hexadecimal)

Write Data (Hex):

Display in Hex, then 11 is first byte, 22 is second byte, and 1122 is first word.

Total 8 bytes, in other words, total 4 words.

4. EPCC1-G2 Test

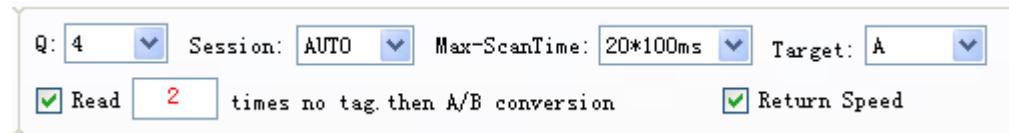
4.1 Query Tag EPC

(1) Select EPC or TID to read,



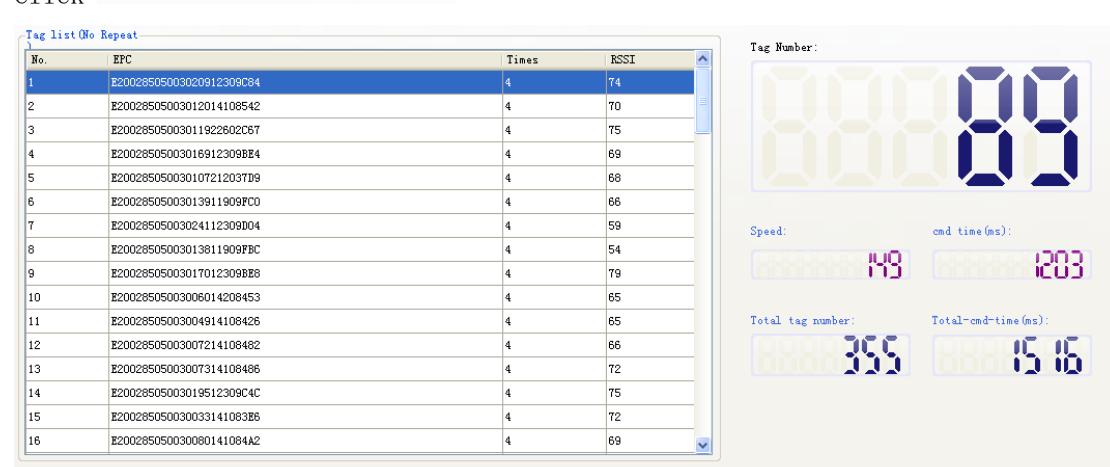
like

Select other condition



Note: about Q , S choice, a single tag or less number must be $S0$, a lot of tag queries using $S1$ or $S2$, $S3$. 2^Q equal tag number is better. If it is a single query effect must use $S0$ if Session select $AUTO$, only effective by query EPC . For this demo, session is $AUTO$, reader will read tag by preset antenna. Other session, you can select ant by you specified. Also if you write demo by yourself, you can specified antenna with Session- $AUTO$ too.

(2) Click



(3) if select Mix query

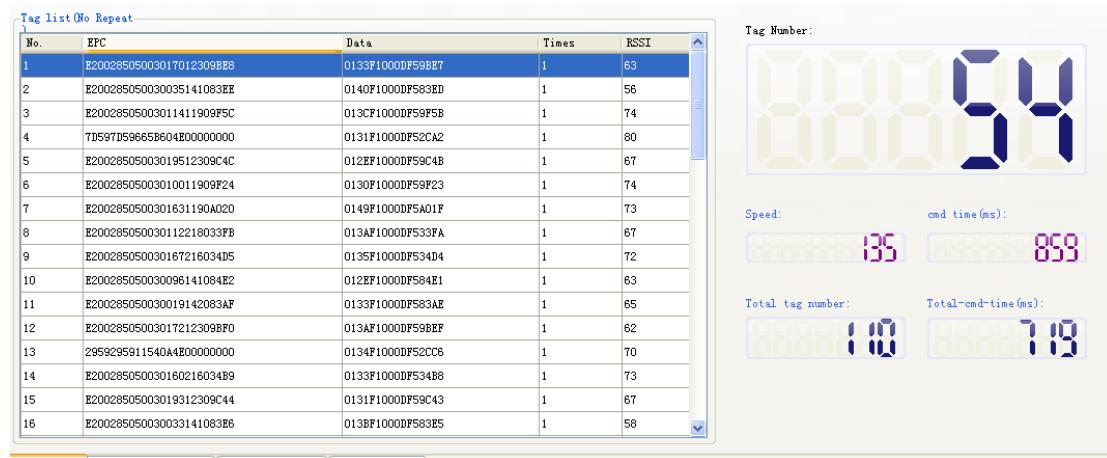
,we

can select read memory, for example:

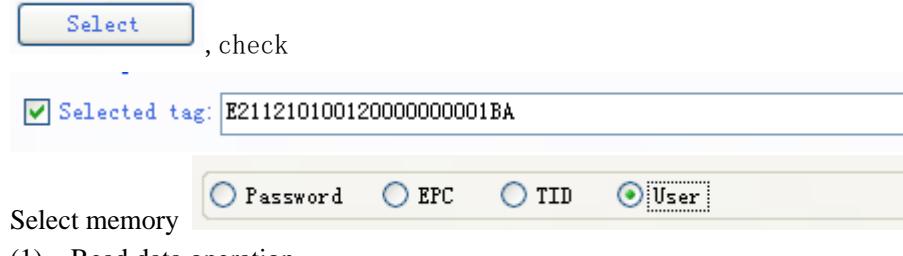
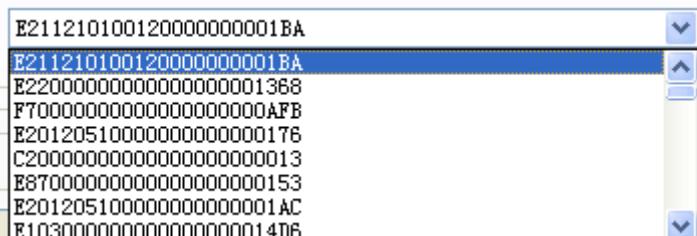
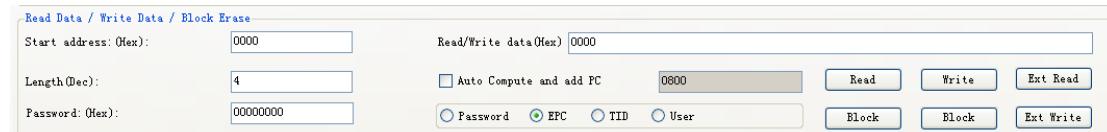


,click

, can see:

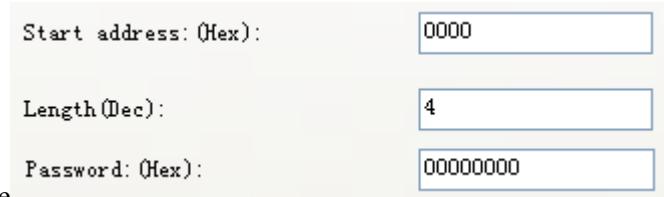


4.2 Read Data, Write Data, Block Erase



Select memory to be operation

(1) Read data operation

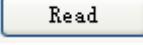
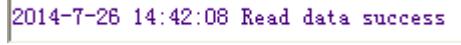


<1> Input data like

Start address: 0x00 stand in start to read data from first word in the designated storage area, 0x01 stand in start to read data from second word in the designated storage area, and so on.

Read the length: Number of the word to be read. It read 120 words at most. Can not set 0 or 120, otherwise, return the parameter error information.

Access password: From left to right it is the former high-word, low word in the access password. If operation don't need access password, it can be the arbitrary value, but can't lack.

<2> Click  can see 

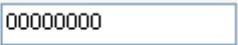
Read/Write data(Hex) 

 is used to read large memory of tag.

(2) Write data operation

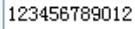
<1> Input Write data word address

Start address: (Hex):  and Password

Password: (Hex): 

Start address: 0x00, the first word of data (from left) is written in address 0x00 of the designated storage area, and so on.

<2> Input data what you want to write like

Read/Write data(Hex) 

<3> Click  can see 

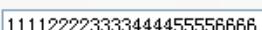
Note: write data can be used to change the EPC number

(the method is as follows)

<1> Choose memory , and

select Auto Compute and add PC

<3> Write EPC number

Read/Write data(Hex) 

(EPC memory Address of tag is 2)

<4> Click  can see

2014-7-26 14:45:10 Write data success

Then query tag EPC, can see

Tag list (No Repeat)			
NO.	EPC	Times	RSSI
1	111122223333444455556666	3	132

Ext Write

is used to Write large memory of tag.

(3) Input erase data address and length

Start address: (Hex):	<input type="text" value="0000"/>
Length (Dec):	<input type="text" value="4"/>
Password: (Hex):	<input type="text" value="00000000"/>

Start address: 0x00, the first word of data (from left) is written in address 0x00 of the designated storage area, and so on.

The difference from write operation: Needn't fill in the data.

<4> Click **Erase** can see

2014-7-29 12:07:56 Block erase success then the data will be set to 0

(4) Write block operation

<1> Input Write data word address

Start address: (Hex):	<input type="text" value="0000"/>	and Password
Password: (Hex):	<input type="text" value="00000000"/>	

Start address: 0x00, the first word of data (from left) is written in address 0x00 of the designated storage area, and so on.

<2> Input data what you want to write like

Read/Write data (Hex)

<3> Click **Write** can see

2014-7-26 14:45:10 Write data success

4.3 Revise the password

(1) Select one tag

Selected tag:

Select memory Password EPC TID User to be operation

(2) Write access password Password: (Hex): 00000000

Access password: default is 00000000, if you have changed to others, you should input right values.

(3) Revise the access password 12345678: Write Start address: (Hex): 0002 Read/Write data (Hex) 12345678 Click

(4) Revise the kill password 12345678: Write Start address: (Hex): 0000 Read/Write data (Hex) 12345678 Click

(5) If succeed, we can see

4.4 Write EPC

Write EPC

EPC: Password: (Hex)

(1) Write access password (If EPC area of the tag has not set password protection, we can write 8 data arbitrarily)

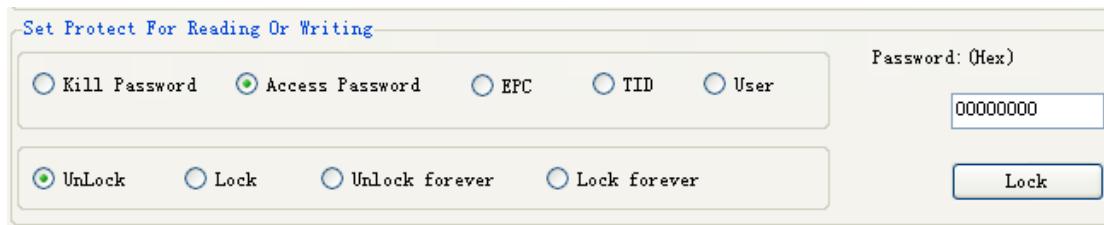
(2) Write EPC.

(3) Click . (Random write one tag in the effective range of antenna)

When there are many or EPC pieces of tag in the effective range of antenna, and the access password of one tag is the same as you entered, or EPC area of tag set no password protection,

click at a time, random write EPC number of one tag in the effective range of antenna.

4.5 Lock Operation



(1) Select one tag

Selected tag: E211210100120000000001BA

(2) select memory



to be operation

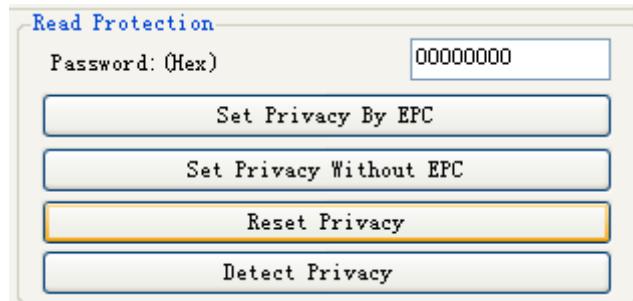
(3) select protect type



(4) Input access password Any storage area in no password protection status still must write the correct access password.(password can not be zero).

(5) Click **Lock** then, the option is over.

4.6 Read Protection



Select one tag

Selected tag: E211210100120000000001BA

(1) Set Single Tag Read Protection

Set Privacy By EPC

According to EPC number of the tag, setting read protection, make tag unable to be read and written by any order, even if query the tag, it is unable to get EPC number of the tag. Only NXP UCODE EPC G2X tags valid.

(2) Set Single Tag Read Protection without EPC

Set Privacy Without EPC can set tag read protection in the effective range of antenna

The difference from **Set Privacy By EPC**: When there are several tag in the effective range of antenna, reader don't know the tag which the order operate.

If operate several tags, then the access password of the tag had better be the same. Only NXP UCODE EPC G2X tags valid.

(3) Reset Single Tag Read Protection without EPC

Reset Privacy Use for reset the tag read protection.

Only put a tag in the effective range of antenna. Only NXP UCODE EPC G2X tags valid.

Comments: If tag does not support the read protection setting, it must be unprotected.

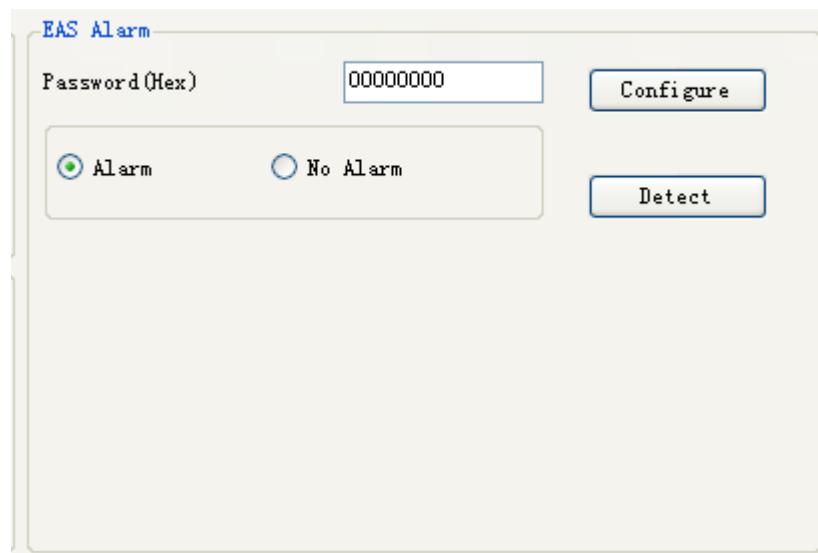
(4) Detect Single Tag Read Protection without EPC

<1> Click **Detect Privacy**

Can't detect tag whether it support read protection order, can only detect single tag whether it is protected. If tag does not support the read protection setting, it must be unprotected.

Make sure that there is single tag in the effective range of antenna. Only NXP UCODE EPC G2X tags valid.

4.7 EAS Alarm



Select one tag

Selected tag: E211210100120000000001BA

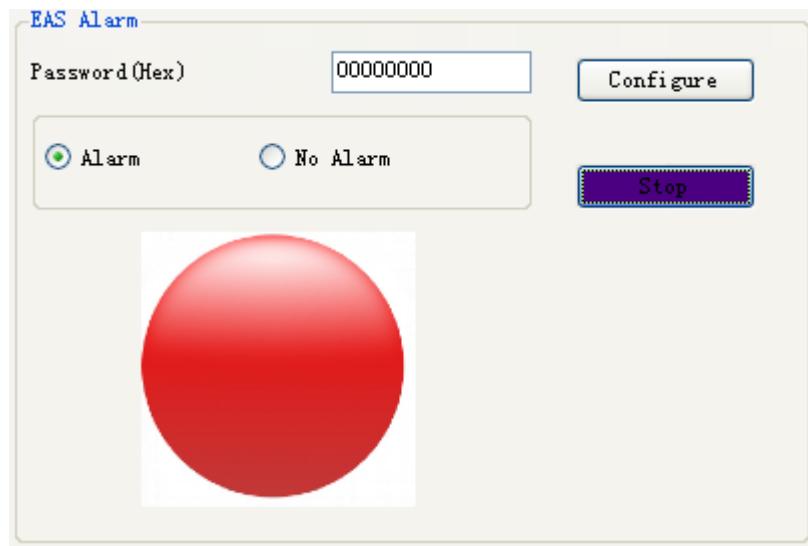
(1) Alarm setting



Set or reset the EAS status bit of tag. Only NXP UCODE EPC G2X tags valid.

(2) Check alarm without EPC and access password

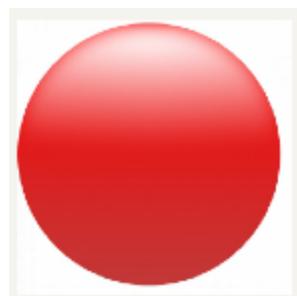
<1> Click check alarm



Check the EAS alarm of tag. Only NXP UCODE EPC G2X tags valid.

<2> EAS alarm:

2014-7-29 14:27:37 EAS Alarm



No EAS alarm:

2014-7-29 14:28:26 No EAS Alarm

4.8 Kill Tag (Permanently Kill)

(1) Select one tag

Selected tag: E211210100120000000001BA

Kill Password: (Hex)	12345678
----------------------	----------

(2) Write

Kill password can not be the whole 0. Otherwise, the tag can not be killed, and the tag return response with parameter error.

(3) Click **Kill tag**, if success, the tag is killed.

4.9 Mask conditions

Mask	
Mask Start Bit Address (Hex):	0000
Mask Bit Length (Hex):	00
EPC	TID
User	<input type="checkbox"/> Enable
Mask Data (Hex): 00	

check enable

Mask	
Mask Start Bit Address (Hex):	0000
Mask Bit Length (Hex):	00
EPC	TID
User	<input checked="" type="checkbox"/> Enable
Mask Data (Hex): 00	

Only check enable can do mask operation.

For example, EPC mask:

Choose EPC area:

<input checked="" type="radio"/> EPC	<input type="radio"/> TID	<input type="radio"/> User
Mask Start Bit Address (Hex):	0020	
Mask Bit Length (Hex):	08	
Mask Data (Hex):	DA	

Only the first byte of tag's EPC is DA could response.

For example, TID mask:

Start	<input type="radio"/> EPC	<input checked="" type="radio"/> TID
--------------	---------------------------	--------------------------------------

<1>Query TID

Can see TID

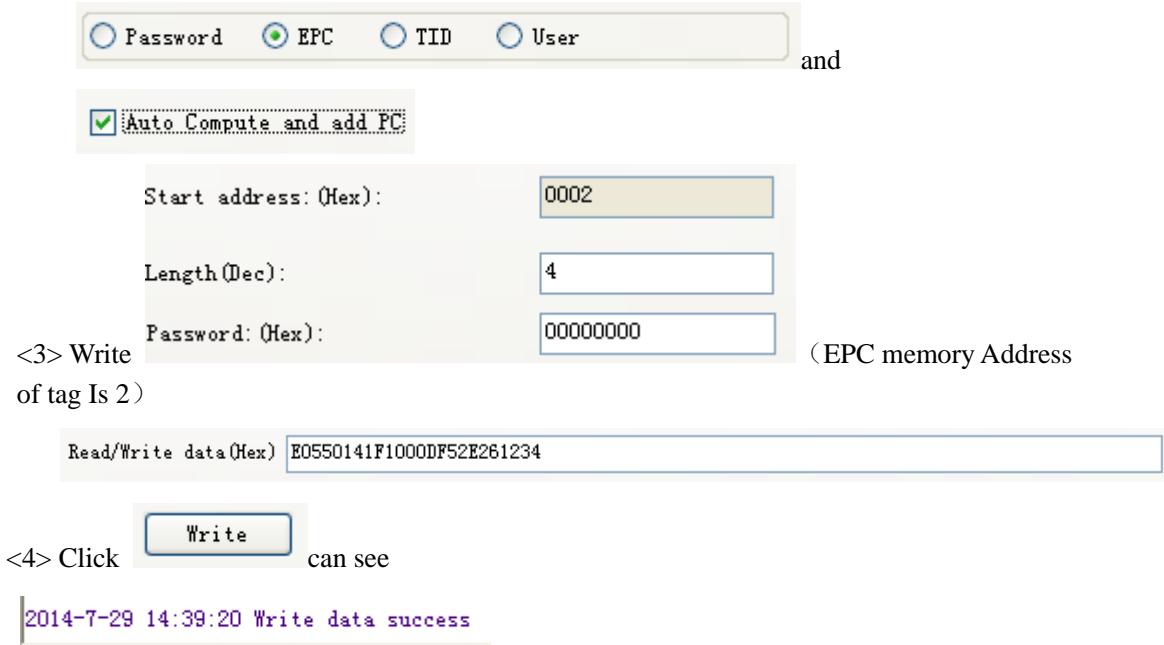
NO.	EPC	Times	RSSI
1	E20034120141F1000DF52E26	8	133

<Mask condition>

Mask	
Mask Start Bit Address (Hex):	0020
Mask Bit Length (Hex):	40
EPC	<input checked="" type="radio"/> TID
User	<input checked="" type="checkbox"/> Enable
Mask Data (Hex): 0141F1000DF52E26	

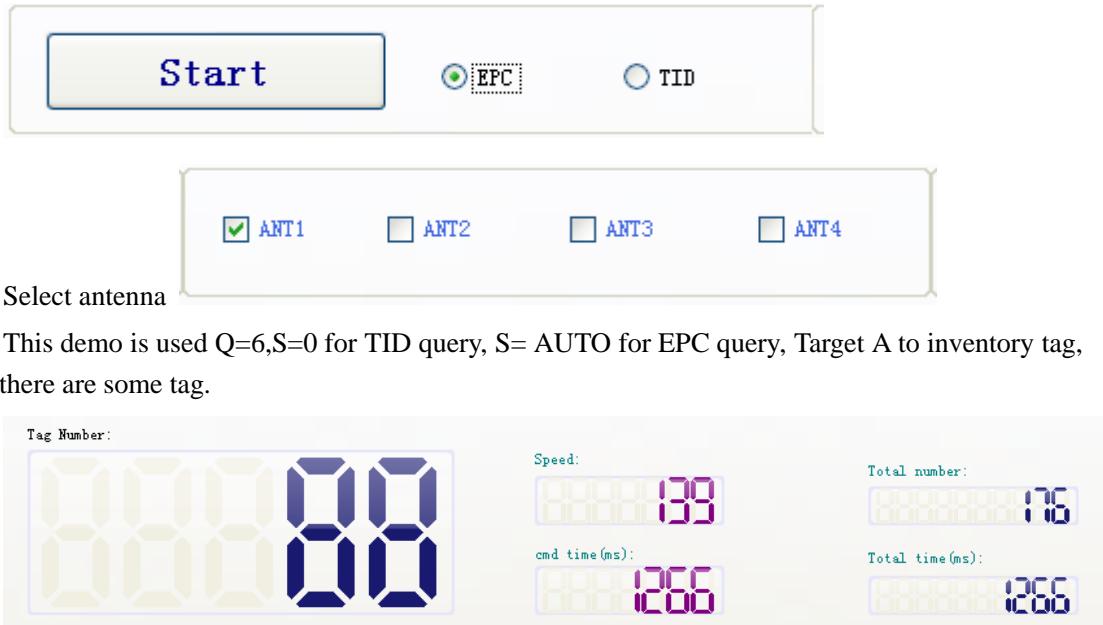
For example change EPC :

<2> select

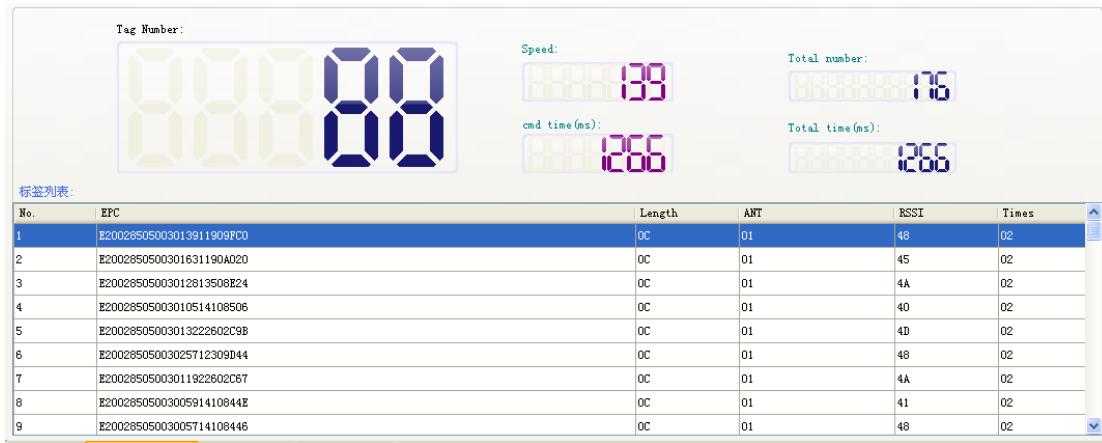


5. Buffer operation

(1) Select EPC/TID query. For example: EPC



(2) is used to read tag in the buffer, if there are tag



Clear Buffer

(3) **Clear Buffer** is used to clear tag information in the buffer.

Read and Clear Buffer

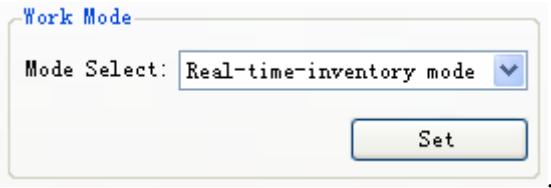
(4) **Read and Clear Buffer** is used to read out tag and clear tag in the buffer.

Get Buffer Tag Number

(5) **Get Buffer Tag Number** is used to get

6. Auto real-time-query mode

(1) on reader work mode setting, you should set reader to



(2) on page "Real time inventory", Click

Start

to get data, if reader read tag, you can see that:

No.	EPC	Length	ANT	RSSI
1	E200285050030041218032DF	12	0001	31
2	E20028505003012014108542	12	0001	3E
3	E200285050030033141083E6	12	0001	42
4	E200285050030082141084AA	12	0001	2D
5	E20028505003014322602CC7	12	0001	33
6	E20028505003014321603475	12	0001	35
7	E20028505003022922602E1F	12	0001	4D
8	E20028505003013222602C9B	12	0001	45
9	E200285050030097141084E6	12	0001	46
10	E200285050030080141084A2	12	0001	38
11	1951CAFE10201010100020101004AAAA	16	0001	28
12	E200285050030081141084A6	12	0001	3D
13	E200285050030025141083C6	12	0001	43
14	E20028505003011141083E	12	0001	3F
15	E200285050030032141083B2	12	0001	44
16	E20028505003020522602DBF	12	0001	4F
17	E20028505003019512309C4C	12	0001	3B
18	E20028505003013911909FC0	12	0001	46
19	E200285050030158216034B1	12	0001	3D
20	E2002850500301812160350B	12	0001	43
21	E2002850500300431420840F	12	0001	47

7. 18000-6B Test

7.1 Query Tag

Click button start



if read tag, we can see:

No.	ID	ANT (4, 3, 2, 1)	Times	RSSI
1	E004000085D94502	0001	1	112

7.2 Read and Write Data Block / Permanently Write Protect Block of Byte

Select one tag from tag list. and double click. Then we can see

Current Selected VID: E004000085D94502

(1) 'Read data' input data for example:

Start address (Hex): 08 Read length (Hex): 08

Start address: 0x00 stand in start to read data from first word in the designated storage area, 0x01 stand in start to read data from second word in the designated storage area, and so on. Range is 8~223. Beyond this range, reader will return parameter error.

Read length: pointed to the number of bytes to read. Range is 1~32. If Start address + Read length greater than 224, or Read length greater than 32 or is zero, reader will return parameter error information. The high bytes of Read length write in the low address in tag.

,then click **Read**,

Read data(Hex):

If success,

(2)'Write data' for example:

Start address(Hex): Write length(Hex): ,

Write data(Hex):

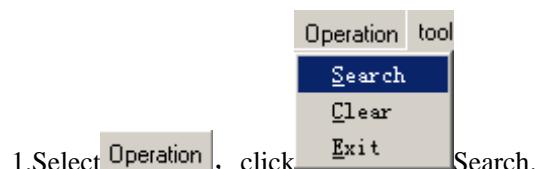
Then click , if success, 2014-9-13 10:12:01 Write data success

(3) lock The specified byte.

(4) Check The specified byte whether locked.

8. Config TCPIP

8.1 Web config

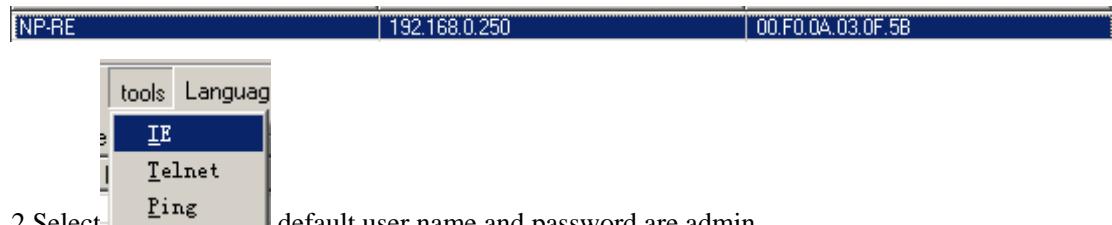


1. Select , click Search.

If device connected.

List of device		
Device Name	Device IP	Device Mac
NP-RE	192.168.0.250	00.F0.0A.03.0F.5B

Select the device



2. Select , default user name and password are admin.



Login.

Summary Information	
Model Name:	00.f0.05.aa.bb.cc
MAC Address:	192.168.0.250
IP Address:	255.255.255.0
Subnet Mask:	192.168.0.1
Gateway:	208.67.220.220
Primary DNS Server:	208.67.222.222
Second DNS Server:	V1.2.2.R3
Firmware Version:	

(1) Select **Network**, default:

Home
 Basic Settings
 Network
 Server
 Serial Channel
 Password Settings
 Power manage
 Log Out

Automatically obtain IP address: Disable Enable

BOOTP: Disable Enable

DHCP: Disable Enable

AutoIP: Disable Enable

DHCP Host Name:

Use the following IP configuration:

IP Address:

Subnet:

Default Gateway:

Preferred DNS server:

Alternate DNS server:

Ethernet Configuration

Auto Negotiate

Speed: 10Mbps 100Mbps

Duplex: Half Full

MAC Address:

Network Type

Ethernet

Finished click

(2) Select **Serial Channel**,

Serial Channel List

Serial Channel List

Name	Remark	Uart Baudrate	Ethernet Protocol	Channel Setting	Serial Setting	Connection Setting	Hostlist Setting
Channel1		57600	TCP	Channel	Serial	Connection	Hostlist

Serial Setting
Serial

Click

Serial Settings

Channel 1

Enable Serial Port

Port Settings

Protocol:	RS232	FIFO:	8
Flow Control:	None	Baud Rate:	57600
Data Bits:	8	Parity:	None
Stop bits:	1		

Pack Control

Max packet length:	1460	Merge length:	1
Idle Time:	0 (ms)	Net Idle Time:	5 (ms)
Latch:	10 (ms)		
Enable Match Packing:	<input type="checkbox"/>	Match 2 Bytes Sequence:	<input type="radio"/> Yes <input checked="" type="radio"/> No
Send Frame Only:	<input type="radio"/> Yes <input checked="" type="radio"/> No	Match Byte:	0x31 0x32 (Hex)

Finished .click

Click

Connection
Setting

[Connection](#)

Connection Settings

Channel 1

Connection Protocol:

Connect Mode

Worked As:

Active Connect: Start Character: 0X61

Endpoint Configuration:

Local Port: Remote Port:

Remote Host:

Use Hostlist: DNS Query Period:

Disconnect Mode

Hard disconnect

Inactivity Timeout: (Secs)

KeepAlive: (Secs)

Finished click

(4) The end select

Power manage

New configurations will NOT take effect until rebooted.

Warning! Both serial and ethernet connections will be dropped and data may be lost while rebooting.

- Load defaults
- Load defaults and reboot
- Reboot
- Save and reboot

Click , Restart your device.

9. FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device does not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

If this device is modified without authorization from Friendcom, the device may no longer comply with FCC requirements for Class B digital devices. In that case, your right to use the device may be limited by FCC regulations. Moreover, you may be required to correct any interference to radio or television communications at your own expense.

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 device generates, uses and radiates radio frequency energy. If it is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user may take one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Reinforce the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or TV technician for assistance.

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.