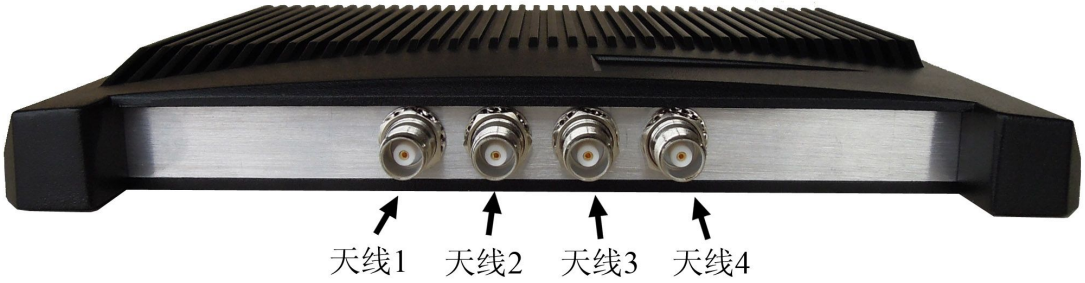
YR8600 four channel uhf rfid reader user manual

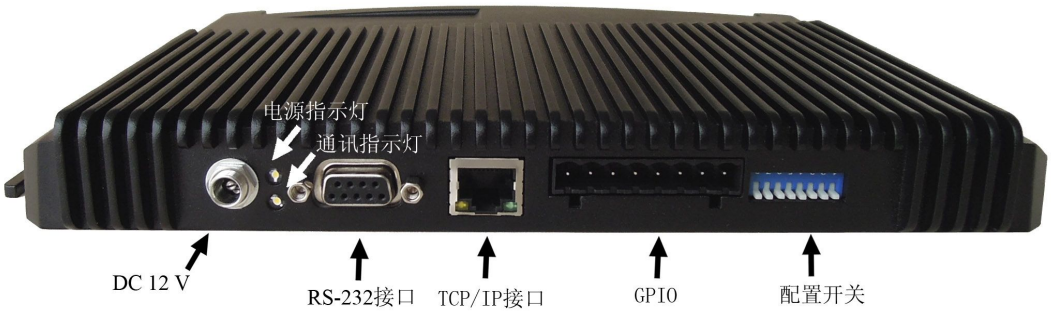
The document scope	
Reader firmware version	V 6.9
Presentation software version	V 3.62

1．Acquaintance your RFID reader

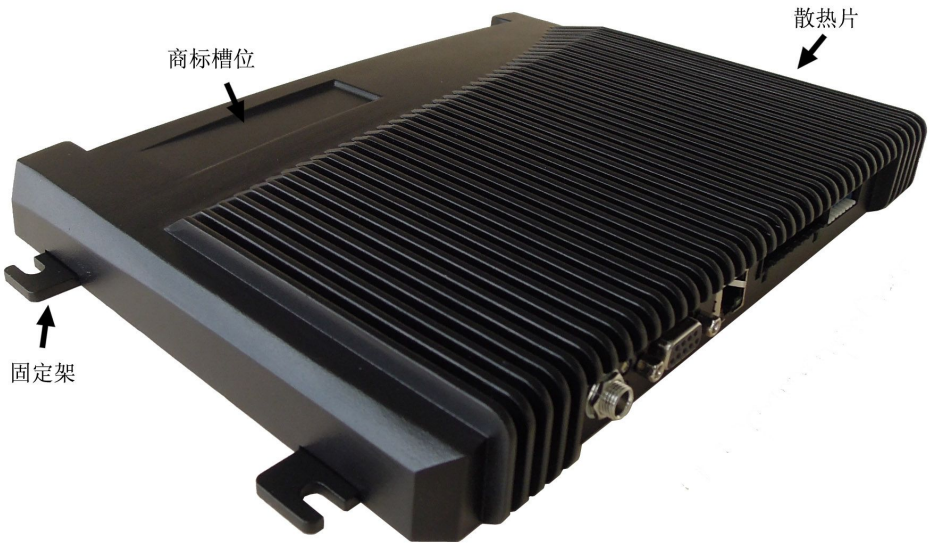
1.1Frontview



1.2Backview



1.3Side view



2. Operation and Settings of reader

2.1 First use

2.1.1 The first step: connect the power supply

let random spin-off power adapter into the power socket, as shown:

At this time, you will be heard a "drops" ringing, power indicator light is lit at the same time. Said to electricity process is normal, reader self-checking passed.

2.1.2 The second step: connect antenna

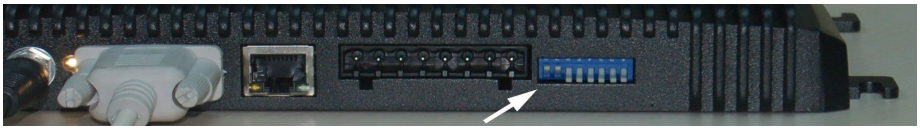
Let the antenna of interface TNC connect to the antenna terminals of reader, as shown in figure:

Can access up to four antennas, as shown in figure:

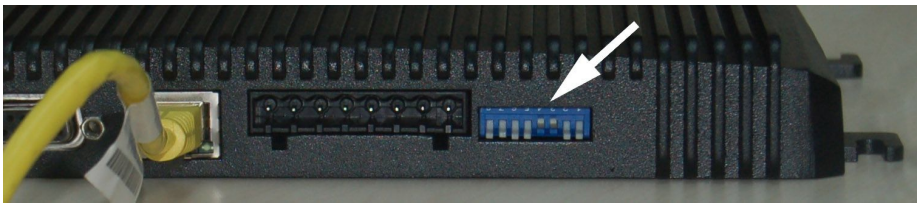
2.1.3 The third step: connection data line

When use rs232 connector , Connected to the computer through the RS - 232 interface, screw down and fixed the bolt.As shown in figure:

At this point, need to let configure switch（7and 8 on） to the position of arrows shown in figure :



Note : if use TCP/IP interface connected to the computer, configure switch（3 and 4 on）as shown:

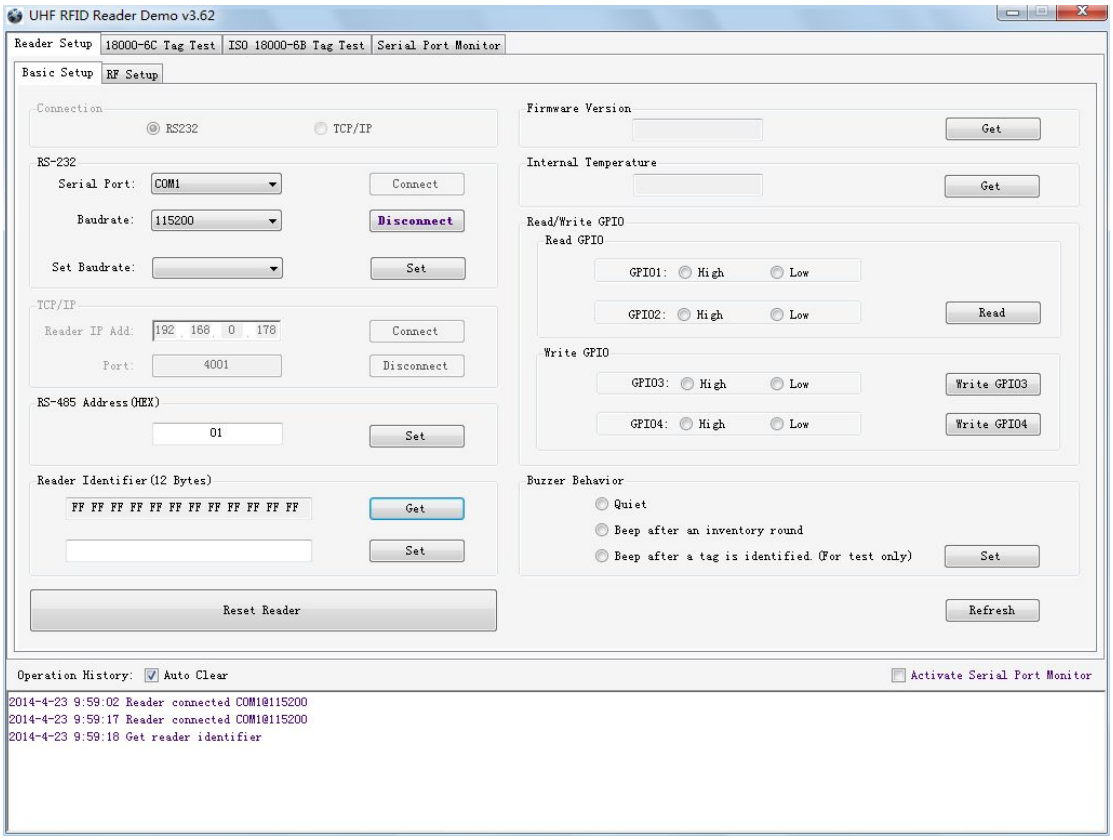


2.1.4 The fourth step: use presentation software operate reader

◆ connect reader

Start Random spin-off presentation software. This software does not need to install, directly let “RFID.DEMO.V1.9.exe” , reader.dll, customControl.dll "three file copy to the same folder, and double-click the executable file " RFID.DEMO.V1.9.exe "

Start-up interface after software as shown:



If reader through the RS - 232 serial port connection, please select RS - 232 in the connection mode, select the corresponding serial number and baud rate. Reader the default baud rate is 115200.

As shown in figure:

And then, click "connect reade button "If the serial interface is not occupied, it will displays the following information in the bottom of the operating record column:

If the reader is connected via TCP/IP interface, you need to make the following steps:

Make sure the PC with Ethernet card.

Make sure the PC Settings and reader's in the same network segment.

Reader using the default Settings, as follows:

IP address: 192.168.0.178

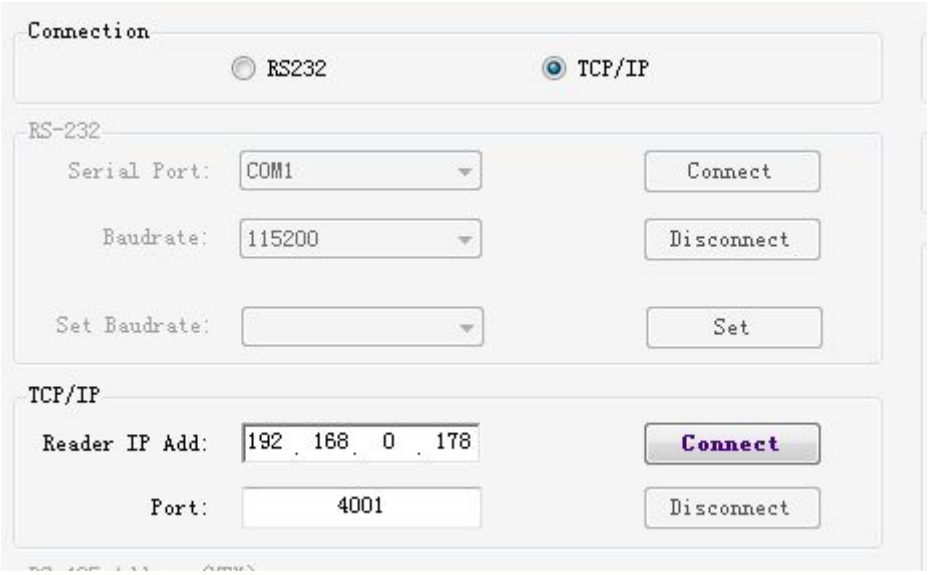
Netmask: 255.255.255.0

Port number: 4001

The specific TCP/IP configuration, please refer to the enclosed document

: \tcpip configuration \IPORT-1UM.PDF。

For the first time to use the machine, please choose configuration in the connection mode ,



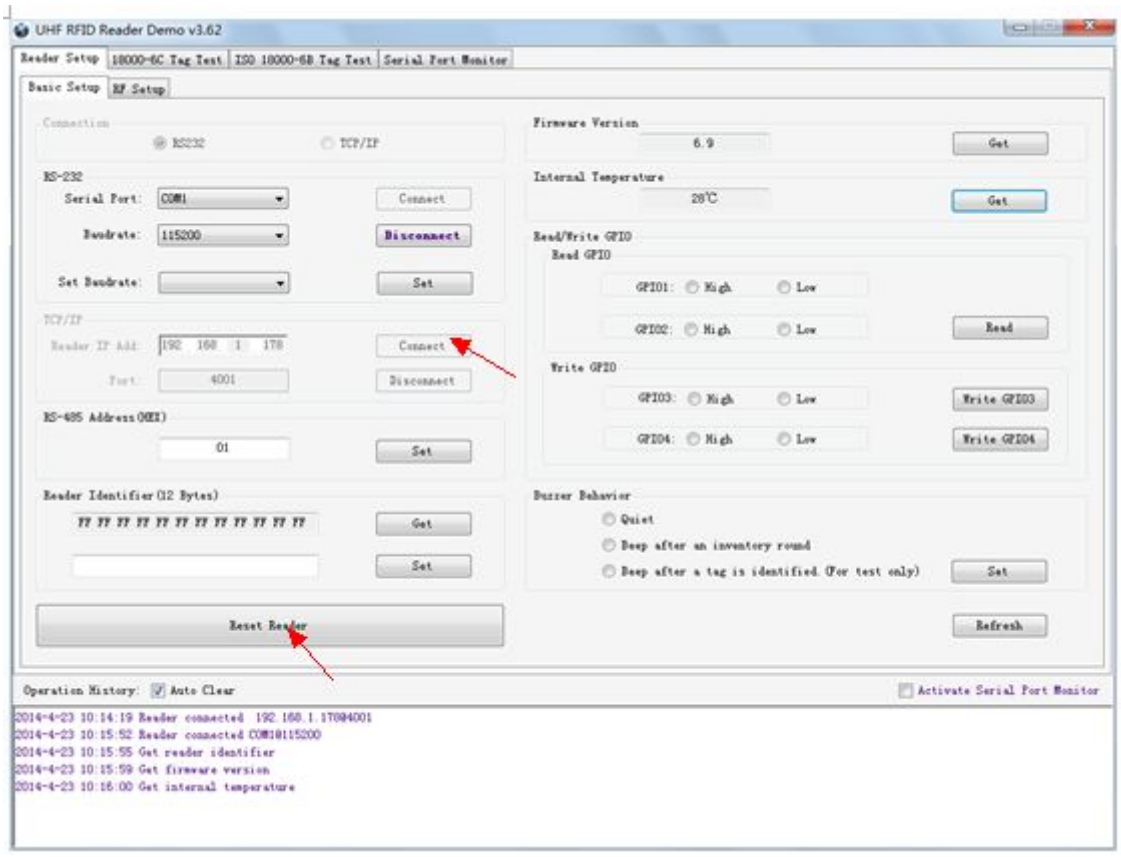
Click blue Connect reader button, if the connection successful, it will display the following information in the bottom of the operating record column:

◆Test the connection whether successful

Click the button as shown in the diagram below arrow position.

Click read version number, firmware version number column will show the firmware version number of the machine.

Click the restart reader button, the reader will restart, can hear the buzzer ringing a cry.



At this time, the reader connected to the computer has been completed successful.

2.2 RFID parameter Settings

We need to set up two most basic RFID parameters, output power and spectrum range.

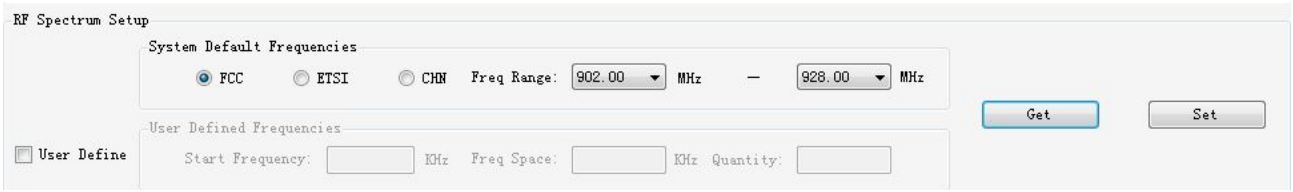
2.2.1 set RFID output power

RFID output power refers to RFID signal strength of the antenna ports output .The unit is dBm。

The range of output power is 20 dBm- 33 dBm.The default value is 30 dBm (1 W)., after the completion of this value set, it will automatically stored inside the machine, it is not lost when the power is cut off.

2.2.2 sets the radio spectrum specification

The RFID have different requirements in different areas .Reader support frequency range is 865-868 MHZ, 902-928 MHZ. To set the desired operating frequency range through shown below the drop-down box, and button.



When setting spectrum range, should pay attention to the following:

◆ Start frequency and the end frequency should not exceed the scope of the RFID specifications.

◆Start frequency must be less than the end frequency.

◆The difference of start frequency and the end frequency at least more than 2 m.

RFID frequency carrier of reader will random jumping frequency in limit the frequency range after this parameter set successfully.

The default RFID spectrum specification is FCC (902MHz – 928MHz)。

2.3 inventory tag

Properly connected reader, then can read tag operation after the RF parameter setting well,.

Inventory tag that is the EPC number of identify multi tags at the same time. it is the core function of the UHF RFID reader, its performance directly determines the advantages and disadvantages of reader.

2.3.1 cache mode and real-time mode

There are two modes to choose from when Inventory tags. one is a kind of caching pattern, namely, firstly, put into reader the cache after read the tag number of EPC ;finally ,to upload multiple EPC data together when needed.

Another model is real-time mode, namely, immediately upload after read the tag number of EPC, to the recognition next tag after the data uploaded finished.

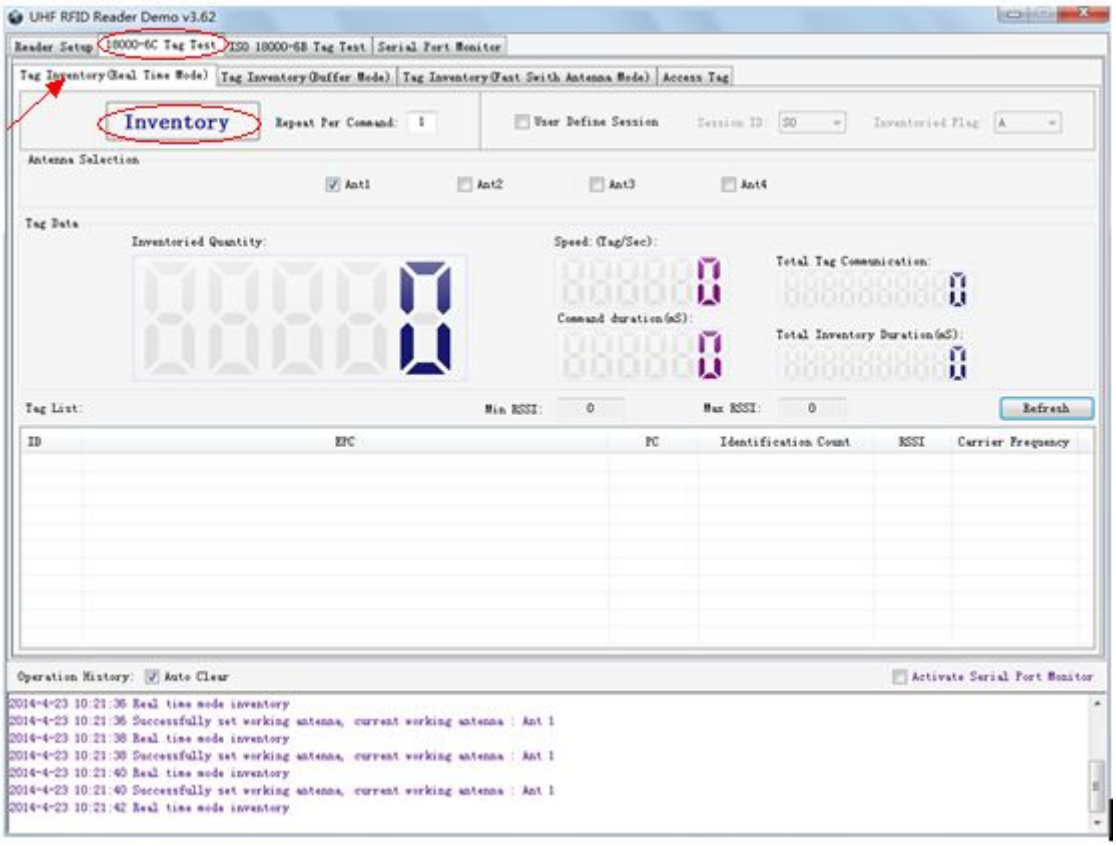
These two models have different characteristics, the advantage of caching pattern with higher efficiency of more tag identification and recognition rate ,and small communication of data volume,because summary upload data is filtered no duplicate data

Real-time model has quick response of advantage, the user can get the label data in the first time, no delay. And can get real-time tag at different times and different locations of RSSI (tag signal strength indicate), frequency parameters (read tag carrier frequency).But there is slightly lower for more tag identification efficiency, more data redundancy.

User can choose the appropriate method of inventory tag according to the practical application environment .

In random spin-off the presentation software, choosing the way of inventory

tags through the following interface:

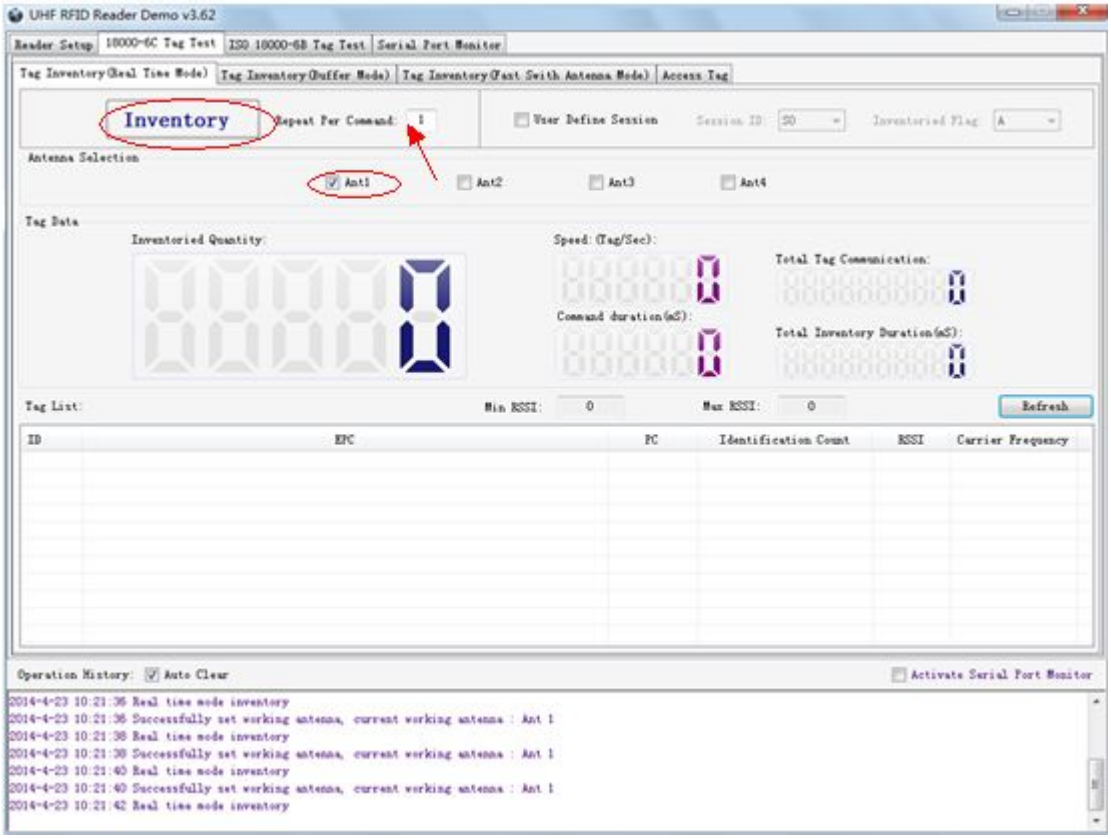


Let's start inventory tags by caching pattern .

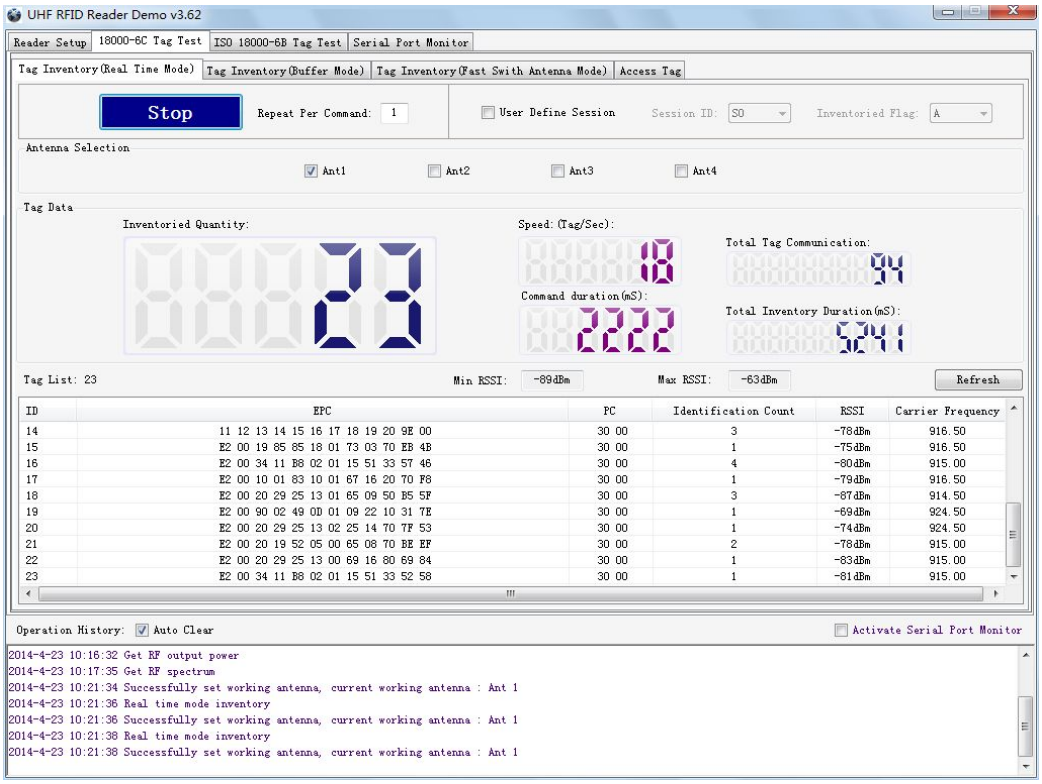
Firstly check the antenna number (please make sure that the antenna reliable connection), then set number of hopping parameter. This parameter that is the number of RF signal carrier frequency change in the process of the round tag inventory. That is the number of hopping frequency .The more number of hopping frequency , the more wider of he frequency range and the higher recognition rate, the more the consumption of time at the same time. Generally speaking, more a number hopping frequency, the more consumption 0.5 to 0.8 s.

Select finished the antenna, can inventory tags after set well the jump frequency number .Click read labels EPC number button.

The corresponding operational area as shown in the figure below:



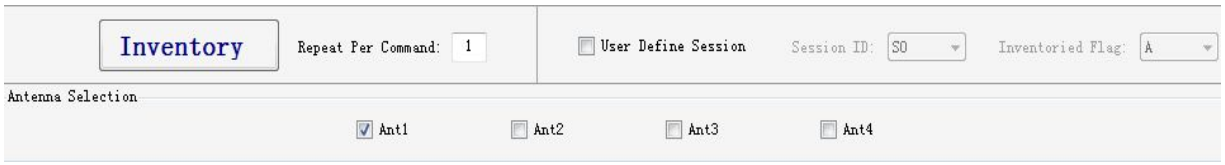
After the finished the operation, the software interface will shows the following information:



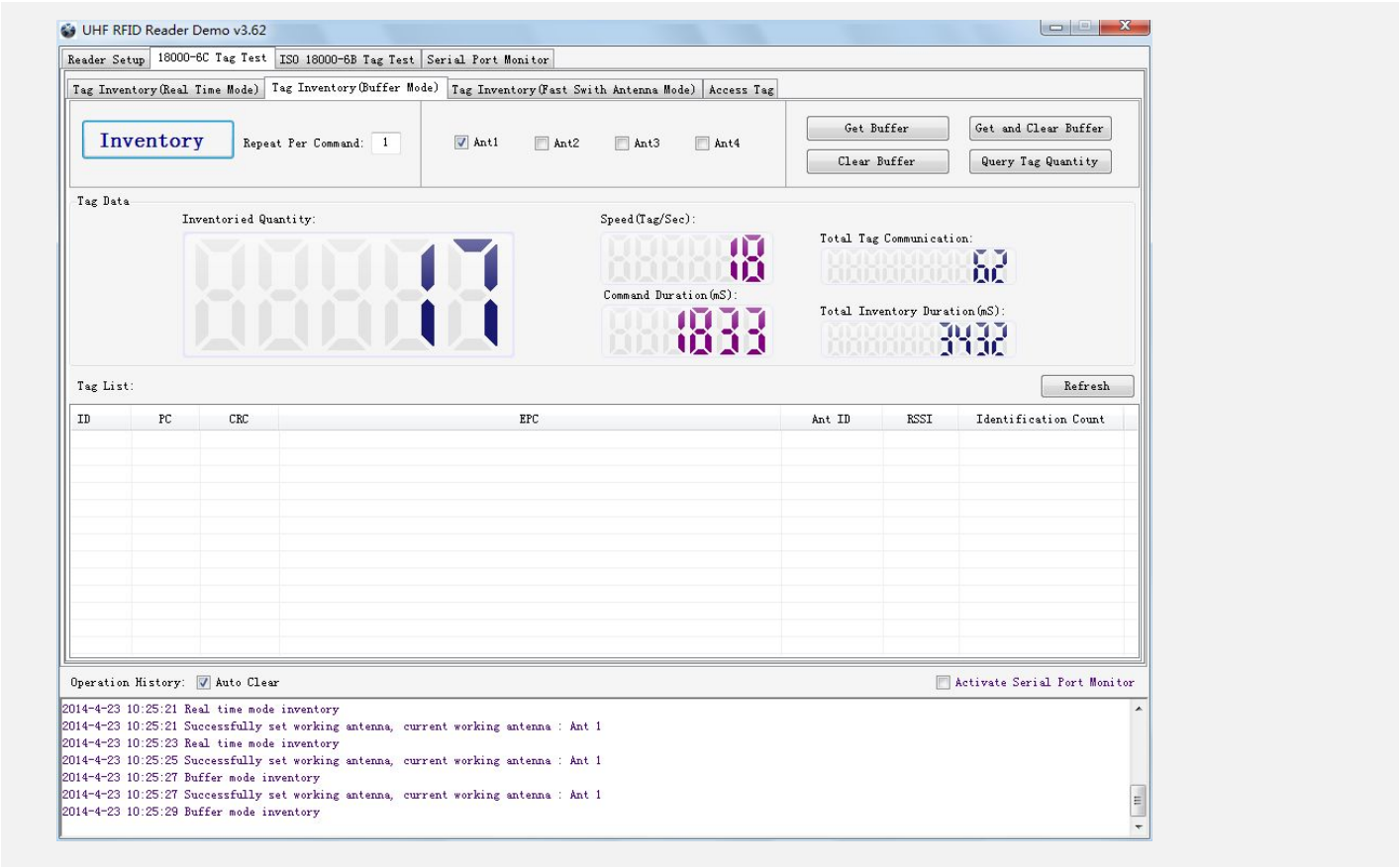
Expression this round of inventory tags operation, recognition to the 87 tags, and

inventory time-consuming 1.656second , The average recognition speed 184 PC/s, in total of read the tag number(including repeat read with a label) 266 times.

We can click EPC number button of read tags again to continue the inventory operation. if you check checkbox of Cycle to send command, the inventory operation will always continue, until uncheck the check box. As shown in the figure below:

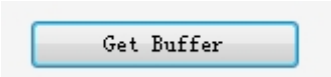


We found that other data are accumulated except recognition speed , as shown in the figure below:

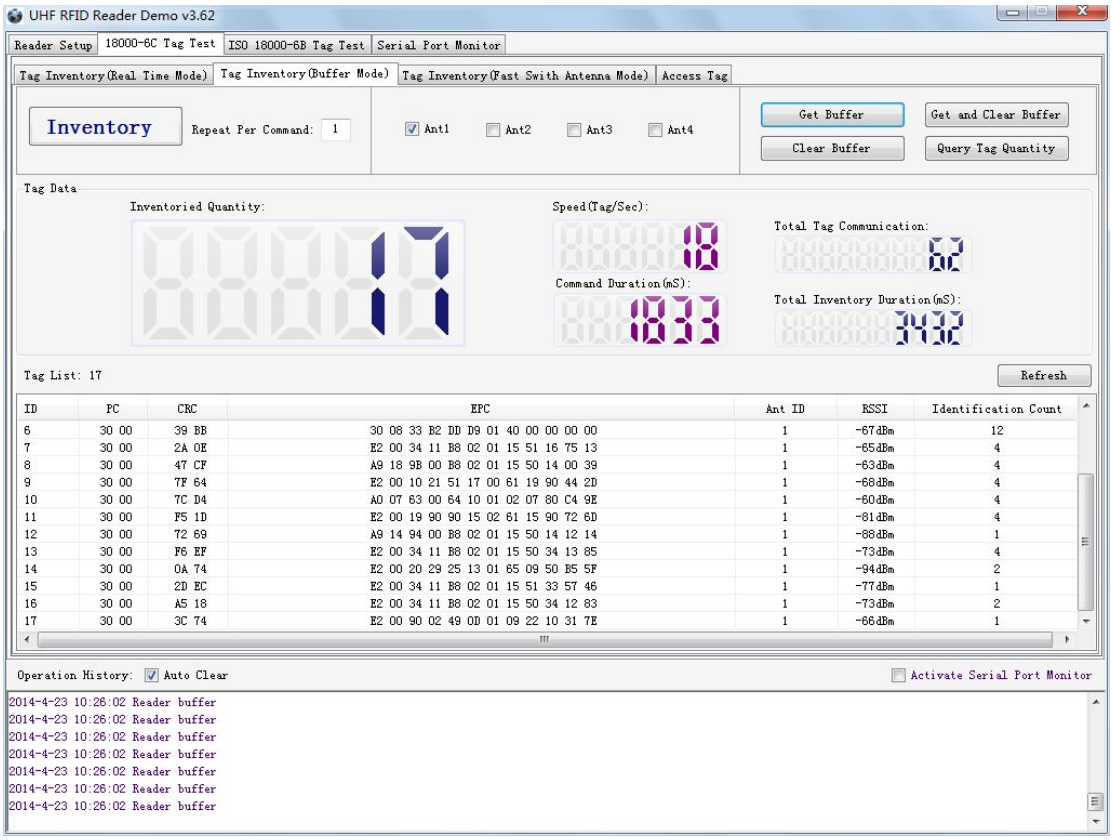


At this time, the cache of reader had stored data of 17pcs tags,

we can remove data through caching operations. Click read cache button:



Then appeared EPC data of label in the list of tag, the following figure:



In the tag list, to distinguish the signal strength through the different colors, and statistics the strongest and the weakest signals size in the upper right corner .

Green is the stronger signal, white is the moderate intensity, light yellow signal is weak.

The different meaning of the list is as follows:

The serial number	the total of tag data serial number should be consistent with the tag number.
PC	PC data of tag EPC area. namely, the protocol control word, specific meaning refer to EPC protocol.
CRC	16-bit CRC check values of tag EPC
EPC	EPC Number of tag
antenna	Antenna number of read the tag at the first time .

Signal strength	The RSSI values of read the tag at the first time .
Read times	The number of the tag be repeat read.

The function of cache operation ‘s other three buttons is very simple and clear, described as follows:

Read and clear the cache: the data of cache is clear immediately after the data read from the cache . Again reading the cache is empty at this time.

Tag number in the query cache: sometimes just know how many tags data in the cache, without to upload all of the content, click the button ,the tag number will showed in the records column of operating

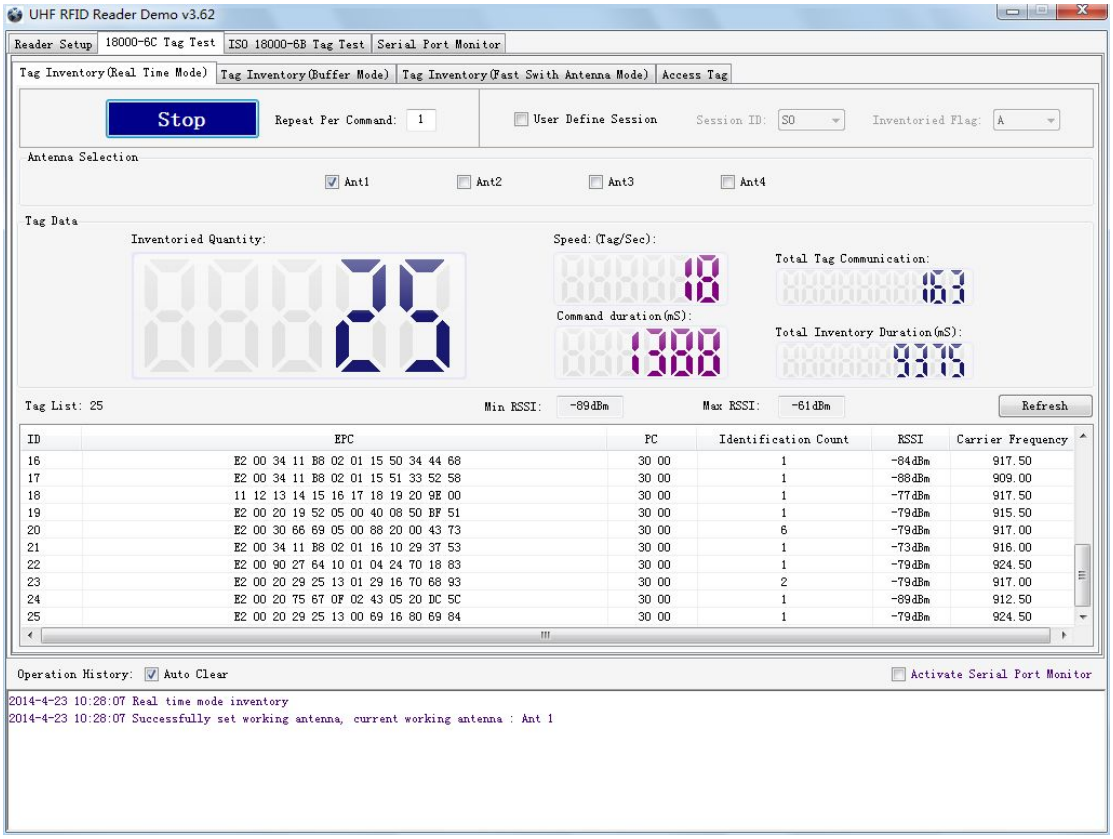
Clear the cache: empty caches, and refresh the software interface.

The above operation that is inventory tags by caching pattern.
Next, we'll introduce real-time mode of inventory tags:

Click the inventory tags (real-time mode) selection box, let software interface to switch to the real time mode. The same as cache mode, check the antenna connected well, and set the times of the Frequency Hopping. If need continuous inventory, please check the "sending

command Cycle to send command ”check box.This is not different with caching pattern.

Next, click the reading tag EPC number buttons, then we can see that the EPC data of the tag wil be upload immediately ,Updated in real time. as shown in the figure below:



If users need to know detailed data of some tag , only need simply click EPC number of the tag EPC number(left) of the list column, on the right side of the real-time data list box will displayed more real-time data of the corresponding tags .It also can hold down the CTRL key, click the multiple EPC number to view the data of the more tags.

The meaning of different list of the list, the meaning is as follows:

On the left of the tag EPC number list (don't repeat) list box:

The serial number	data serial number
E P C	EPC number of tags
P C	Protocol control word of tags
times	The number of tag identified.

Real-time tag data list box on the right side :

The serial number	Serial number of data, if select more the EPC number in the left list box, , serial number is used to distinguish different tags.
E P C	EPC number of tags
RSSI	The signal strength of tag identified .
Antenna number	The antenna number of tag identified .
frequency point	The Carrier frequency of Tag identified .

2.3.2 antenna connection Detection

Antenna connection test functions: check the port whether connects the antenna before read tags, if no, notify the user antenna not connected.

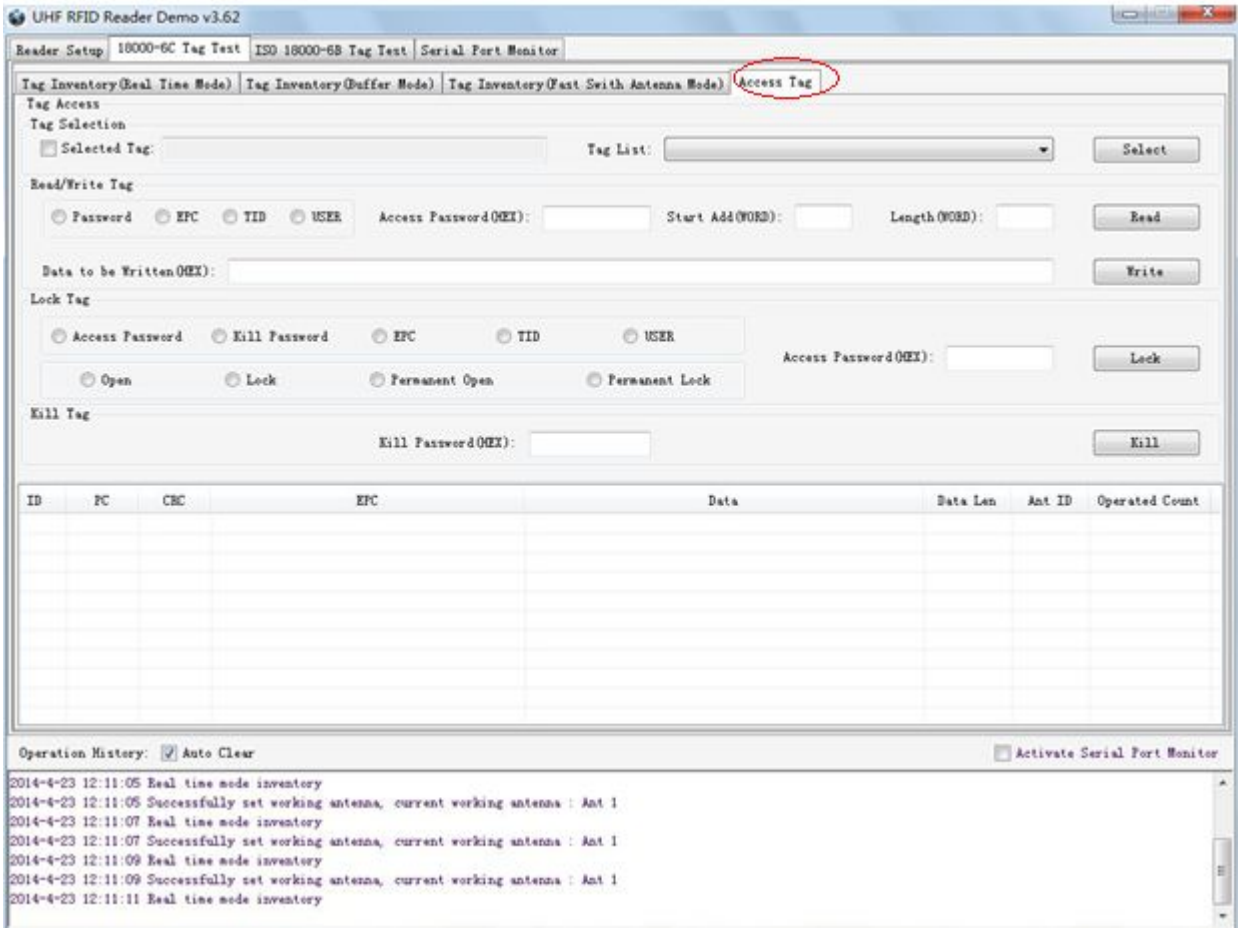
Users need to open this function before use, through shown below to view the interface, set this function:

If the antenna is not connected, read tags operation record will return shown below, and read tag operation will stop at the same time:

◆note: if the user selects the VSWR (voltage standing wave ratio) of large antenna, that is the port impedance match with the bad antenna , or small antenna handheld devices, suggest to shut down this function, otherwise it will prompt "antenna not connected".

2.4 Access tag

Click on the "access tag" check box into the interface of access tag, as shown in the figure below:



The following will introduce how to access tag operation .

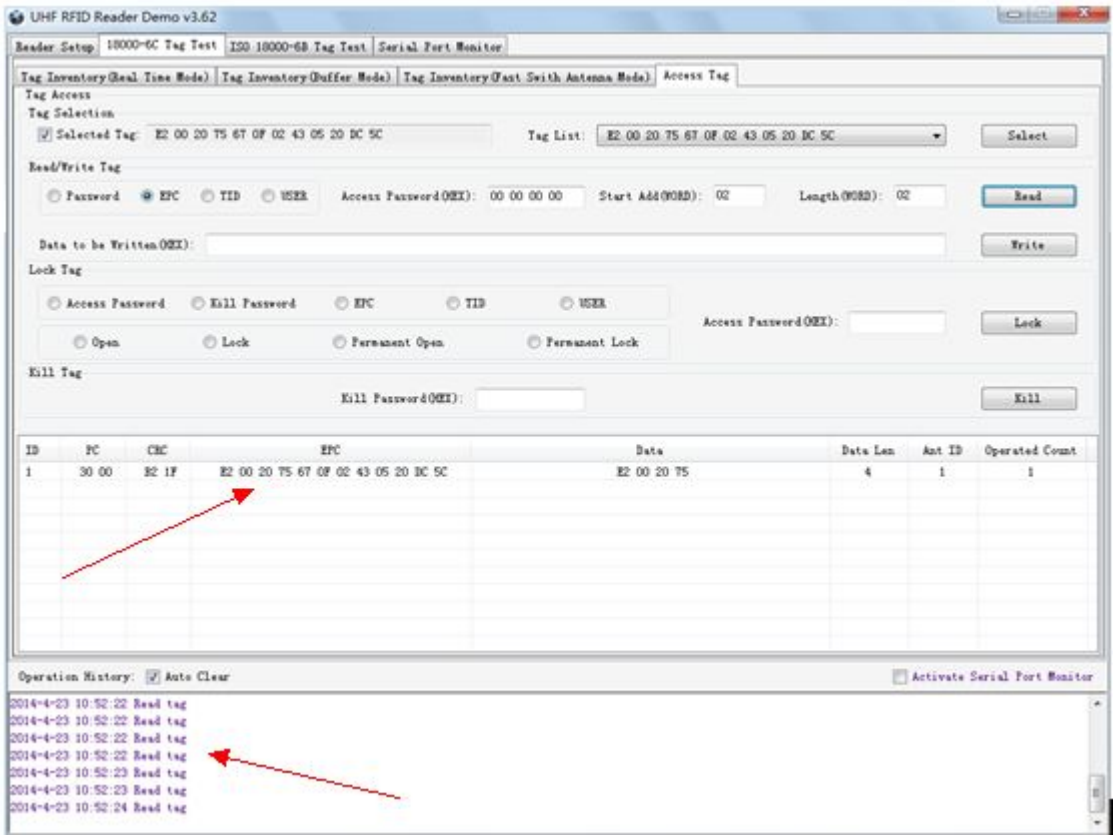
2.4.1 reading labels operation

input parameters of reading tag in the interface of shown below:

Reading tag need to input three parameters: read tag area, starting address and data length. Notice that units of the start address and data length both are a WORD ,that is 16 bit double byte. Click the button of read tag after parameter after set finished

It is important to note that the input parameters need meet the tag's specifications , otherwise there will be error message.

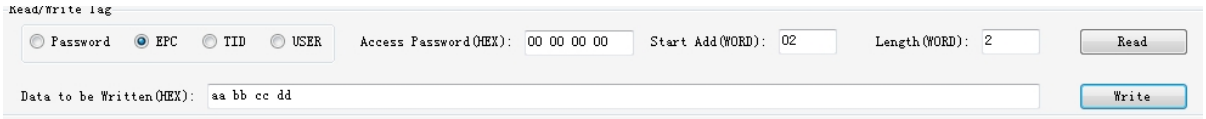
After successful completion the operation, feedback will be shown below:



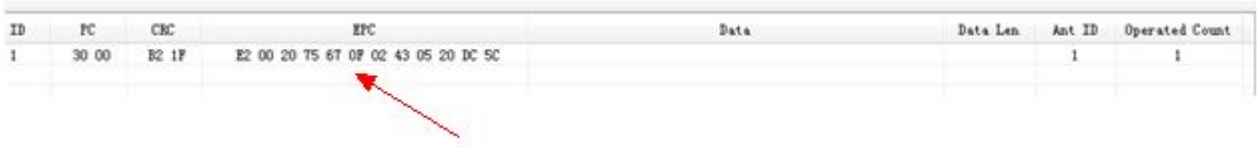
The above graph show Successful reading the information of two tags .Operation how many tags, there will be the same quantity data displayed in the list of the arrow shown .

2.4.2 writing tag operation

Interface of read tag operation and write operation in the same area, the difference is that the write operation also shall provide the access password and to write these data information.



After the successful operation, feedback will be shown below:



Successful operation how many tags, will be shows same quantity data in the area of arrow indicated , the difference with reading tags that is, there is no content in the data column of above graph. The user can read the same area of the tags again, validation data is whether properly written.

2.4.3 lock tag operation

The operation interface of the locking tags ， as shown in the figure below:

It must provide access password for Lock tag .

After the successful operation, it will return the following information:

ID	PC	CRC	EPC	Data
1	30 00	A1 82	AA BB CC DD 67 0F 02 43 05 20 DC 5C	

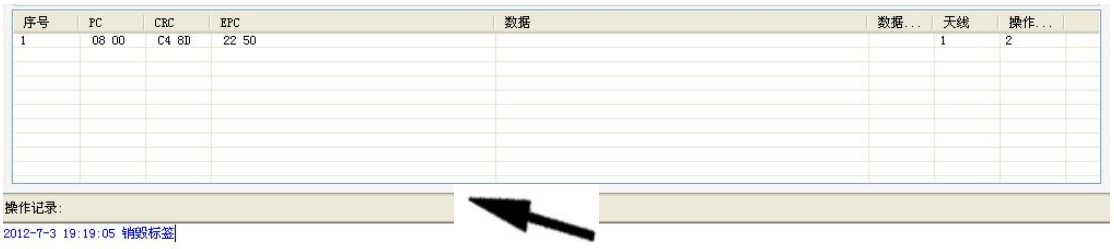
the same as, how many tags operated ,it will shows how much quantity data in the area of arrow.

2.4.4 inactivated tag operation

Operating interface of inactivated tag, as shown in the figure below:

Inactivated tags must provide destruction password and destroyed the password can't be 00 00 00 00, therefore ,destroy one tag, firstly ,need modify the password region 's content by writing tag command .

After inactivated tag success, will return to the following information:



the same as operation of all access tags, how many tags operated ,it will shows how much quantity data in the area of arrow.

As well as the, inactivated how much label, indicating it shows how many records in the area of arrow.

2.4.5 selected tag of the operation

In many cases, we hope that no matter how many tags in rfid area, only for a known EPC tags to access operation, this time, you need use the tag's operation of selected operation (EPC matching function) .

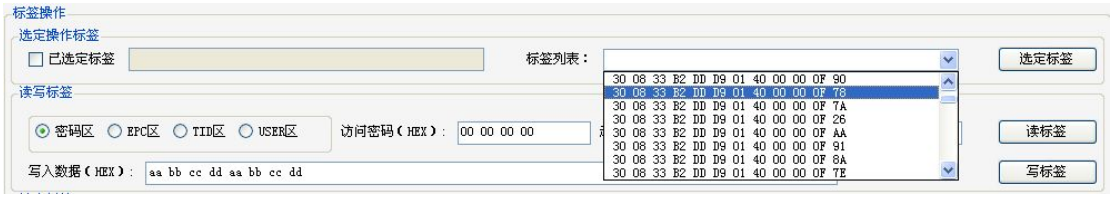
In Random spin-off presentation software, we can operate like this:

◆First to inventory tags by caching mode, to get all the EPC number.

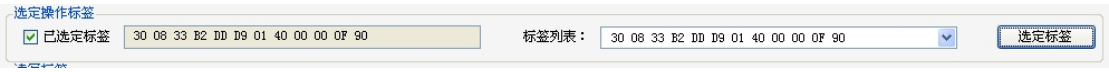
◆And then read the cache.

◆ And then switch to access tag's interface again ,to choose need match the EPC number.

As shown in the figure：



After finished selection ,click selected tag. After the successful operation, as shown in the figure below:



We will see "selected tag" check box which had put a tick on the left side , and select the EPC number will appears in the text box on the left side. Next, all access tag operation just operate the tags with the EPC number .

If you want to cancel the EPC match, the method is very simple, just need uncheck “Selected tag check box”.

As shown in the figure：

2.4.6 error message of access tag may return

In access tag operation process, if the operation improper, there will be a error message, then we will list some of the common operating problems.

◆Successful inventory but access failure:

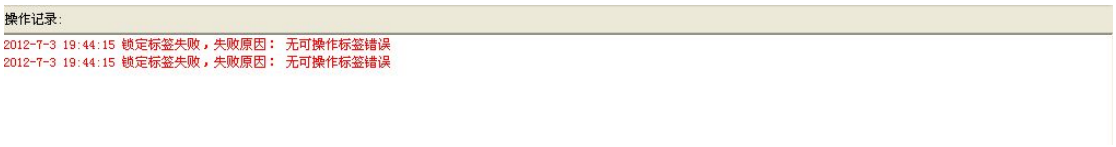
Access tag process, actually divided into two steps, firstly inventory, and then access. Appear .The above tips, it explain that inventory tag successful, but can't access operation. In general, there are two reasons for cause this problem, one is the parameter setting wrong, such as read the storage area where none exists. Another reason, RFID energy not enough,

the operation distance of access tag is approximately 60% - 70% of the inventory operation distance, therefore, if this is the case, please move the tag near the antenna.

◆Access password error:

The cause the problem, as described hints, that is access password set wrong.

◆ don't operation tag wrong :



Rfid area without tags will appear the above tips for operation.

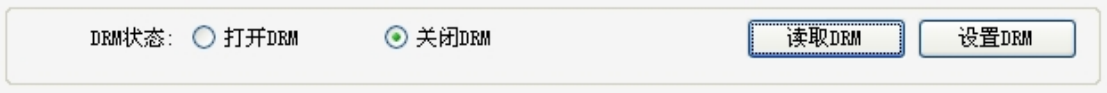
other return information's significance, the user can refer to the document: UHF_RFID Serial interface communication protocol_V1.9.pdf。

2.5 other Settings of reader

2.5.1 sets DRM status

DRM (Dense Reader Mode), intensive reader mode. RF signal will interfere with each other when many reader working at the same time ,if you want to reduce the mutual interference, need to open a DRM model.

Interface as shown in the figure below:



It is important to note that reader sensitivity will be significantly reduced after open the DRM. So user use this feature can according to the actual conditions

2.5.2 monitoring work temperature

When using reader in high strength continuously, it will produce heat, the user can monitor internal working temperature by the built-in temperature sensors, avoid overheating phenomenon (working temperature over 65℃). If the temperature is overheat, can stop to read tags operation for a period of time.

Operation interface of monitor the temperature as follows:

2.5.3 Read and set the GPIO level

GPIO ,namely ,general input/output interface. It provides users with function of Peripheral equipment and reader Trigger each other and control . The reader provides two road light isolated input (GPIO1 and GPIO2), two lines large current relay output (GPIO3

and GPIO4).

Interface as shown in the figure below:

More often, the user will reading and writing GPIO operation in own application, r

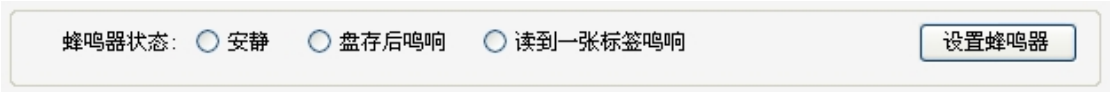
2.5.4 sets buzzer status

Buzzer provide customers with the voice information of reader using state.

The user can close buzzer, also can be set to ringing after each inventory tags.

Can also be set to ring every read each tag, but this will cause lower identification efficiency of more tag .This function is more application the occasion of testing tag or reader.

Operation interface as follows:



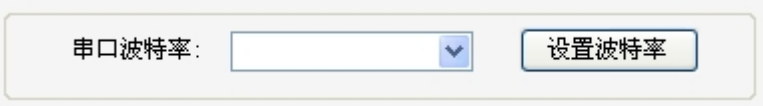
Note that the ringing of the buzzer is not controlled by this setting after successful electricity self-inspection.

Set up completed, the state of the buzzer will keep FLASH of the reader inside ,not lost when cut down the power.

2.5.5 change the serial communication baud rate

The user can change rate of serial port communication, the reader support 4 kinds of baud rate :9600 bps, 19200 bps, 38400 bps,115200 bps。

The user can set the baud rate through the following interface :



After the set successful , a new baud rate will be stored in FLASH of the reader inside, not lost when cut down the power, and the reader restart immediately at the same time. At this time, must be use a new baud rate communication to reader.

Please note:

- if the user used the interface is the TCP/IP interface, also need to change the TCP/IP module to the corresponding rate of serial port, specific operation ,please refer to the Random spin-off in the TCP/IP interface configuration document.
- It will greatly influence the efficiency of inventory tags in real time mode after serial port communication become lower.

3. Develop own RFID application program

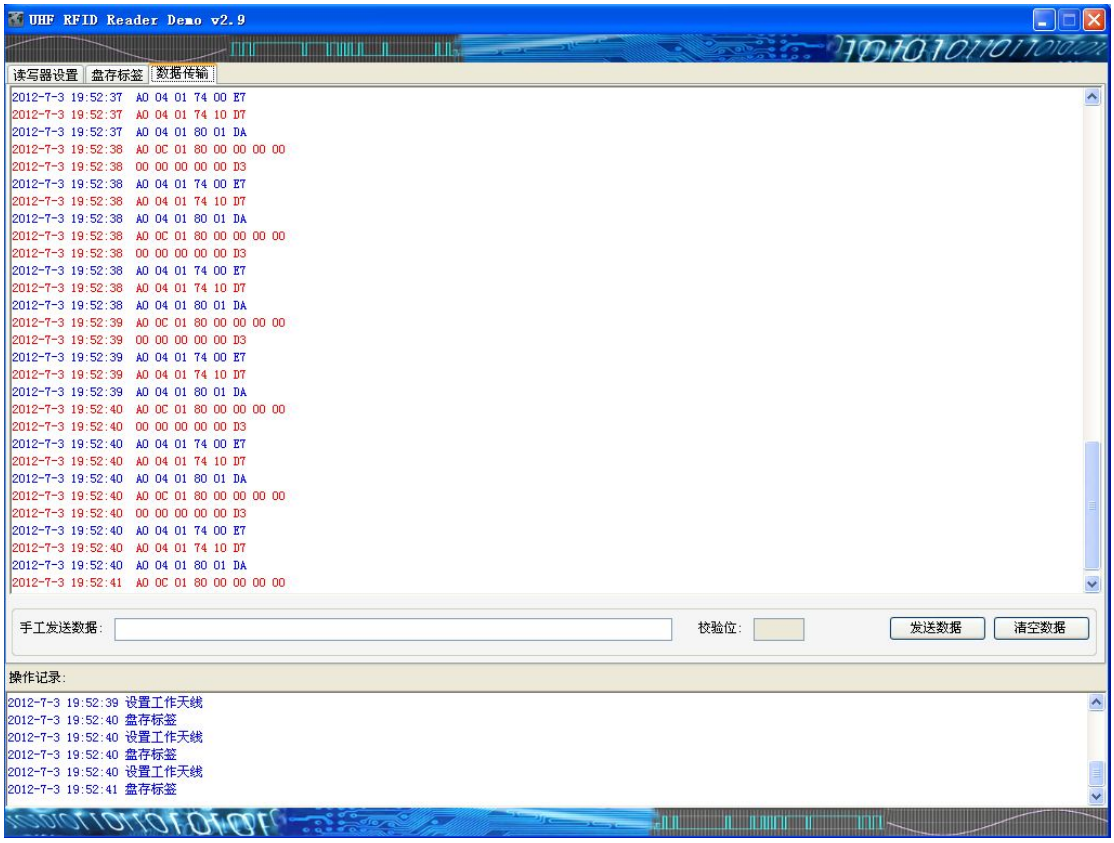
User can operate the most of operations of reader through demonstration program, but in the practical application environment, it is necessary to develop user own program.

Random spin-off Document:”UHF_RFID”serial interface communication agreement” _V1.9.pdf” provides integrity of the interface of operate reader.

This interface is based on serial communication, so whether the user's physical interface is” RS – 232” or TCP/IP, reader all follow the definition of the interface.

Demonstration program provides an important feature, that is transmission record of serial port, user can quickly grasp the content of the communication protocol through combine that compare protocol documentation with actual operation of the serial data of demonstration program in the process .

The serial transmission record data of demonstration program, as shown in the figure below:



blue information that is data of PC sent to reader , red information that is data reader back to the PC.

The data functions by manual to send data, it supply users to debug serial port command used, with function of automatic computing checksum.

In addition, attached with the document also includes the full source code of demonstration program（based on.Net platform of C# language development）,reference for users, to developed applications program based on the reader by fast speed .

Users can refer to the document "uhf rfid develop common problems Q&A. PDF" in the development process , can also contact our technical support engineer at the same time .