Invengo

Software User's Manual

800&500 Series Reader Demo (.NET)

Version:V1.83

Invengo Information Technology Co., Ltd.

Preface

This demo is applicable to the Invengo product models including, but not limited to:

XC-RF861 Reader

This manual provides the information on the software installation, operation and other features.

This manual's version number is V1.83, printed on 2013-01-16

and Invengo logos are owned by Invengo Information Technology Co., Ltd.

Content

1 Overview.....1
1.1 About Demo Software.....1
1.2 System Requirements.....1
1.3 Technical Terms.....1
2 Installing demo software 2
3 XCRF-800 Series Reader Demo User Manual 9
3.1 Running the read demo 9
3.2 Connecting/disconnecting XCRF-800 Series reader 10
3.3 Read and write operation 14
3.4 Configuration menu 21
3.5 Function Menu.....30
4 Troubleshooting 36
Appendix 38

Safety Instructions

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Invengo equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the cautions.

Warning

A warning alerts you of an operating procedure, practice, condition, or statement that must be strictly observed to avoid death or serious injury to the persons operating on the equipment.

Notice

A Note either provides: extra information about a topic or alerts to an operating procedure, practice, condition, or statement or corruption or loss of data, or contains special instructions for handling a particular condition or set of circumstances.

1 Overview

1.1 About Demo Software

The Demo software is used to set system parameters and perform write/read operation on Invengo XCRF-800 series and XCRF-500 series reader and ISO compliant transponders

1.2 System Requirements

- **Supported Operating Systems**

Windows 2000 Service Pack 3; Windows Server 2003; Windows XP Service Pack 2; Windows Vista; Windows 7

These systems are 32-bit operating system. The USB driver does not support 64-bit OS for the time being..

- **Required Software**

Windows Installer 3.0 is required. Windows Installer 3.1 or later is recommended. IE 5.01 or later is required: for installing the .NET Framework.

- **Recommended hardware requirements**

CPU: Pentium 4 at 1.7 GHz or above

Memory: min. 512MB

1.3 Technical Terms

TID: Tag identifier

EPC: Electronic product code

RSSI: Received signal strength indicator

LBT: Listen before Talk

DRM: Dense reader mode

Q: Slot count parameters

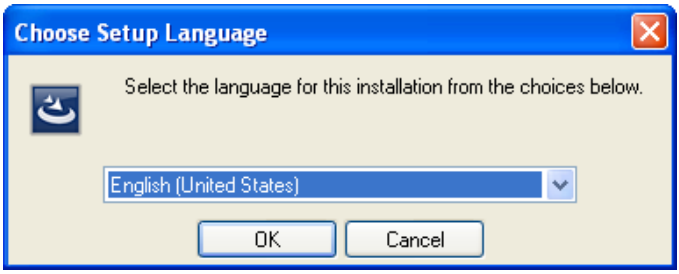
EAS: Electronic Article Surveillance

QT: innovative privacy features of Impinj Monza 4 tag chip

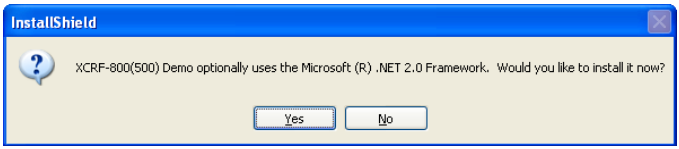
2 Installing demo software

Click'setup.exe'

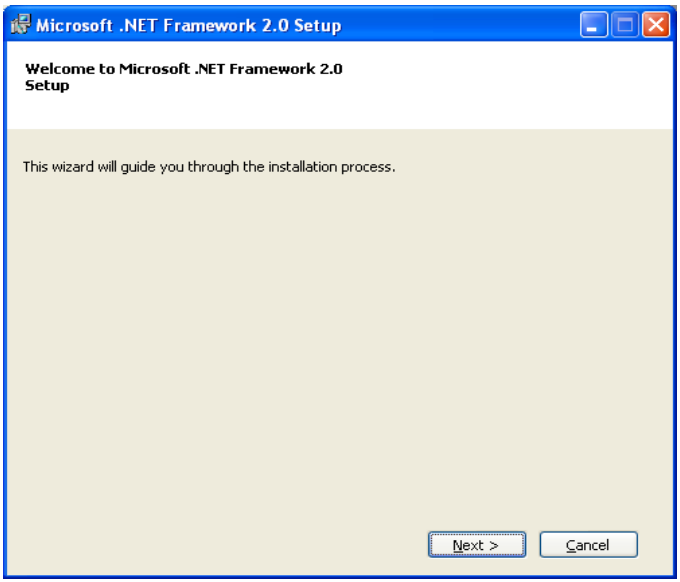
Choose English and click OK button.



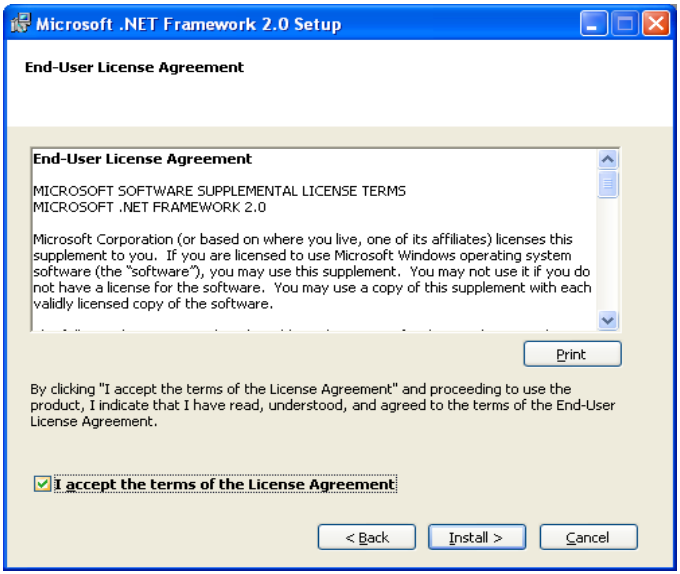
Installation window will pop up if .NET Framework 2.0 is not installed.



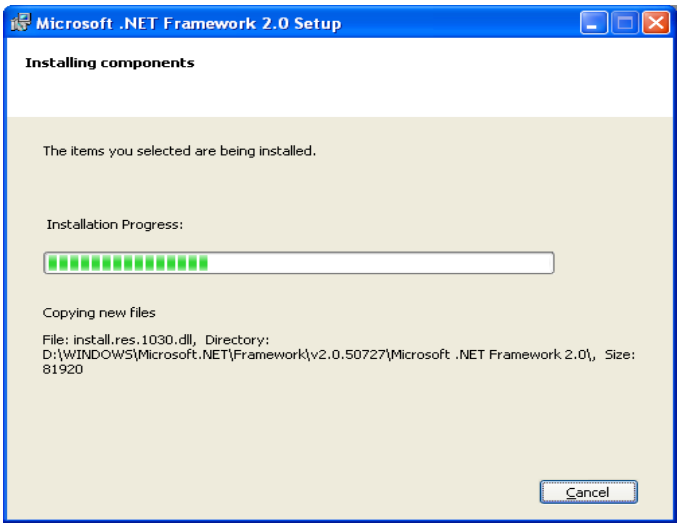
Click 'Yes'.



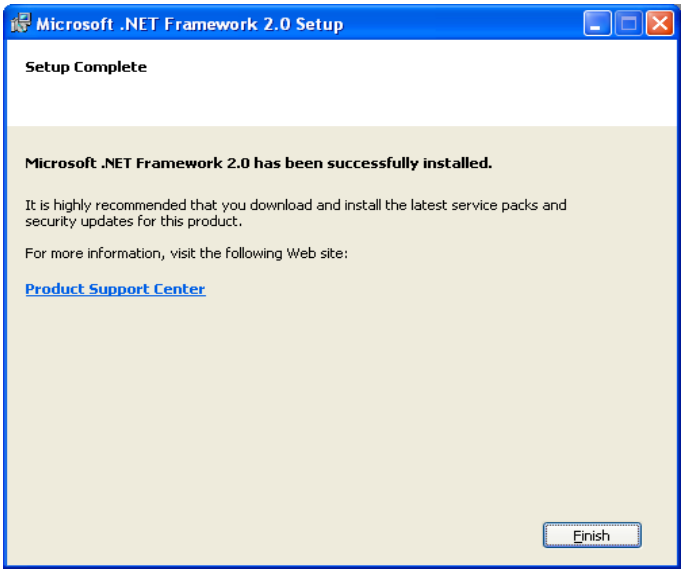
Click ‘Next’. Please refer to the following picture:



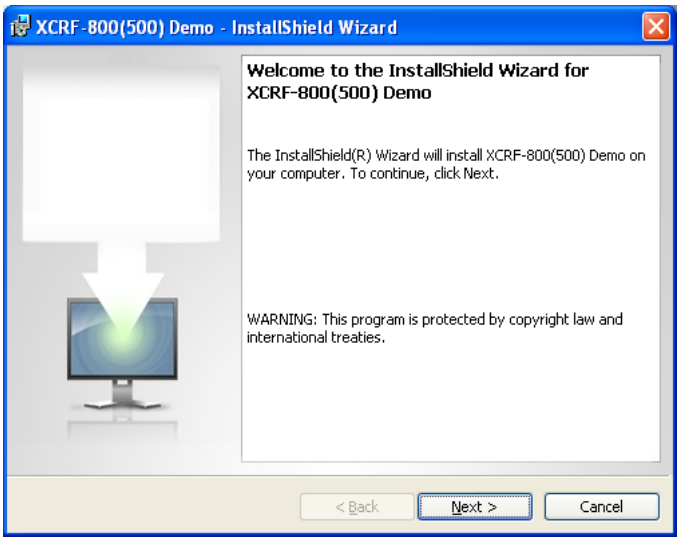
Accept and click ‘Install’ to continue setup.



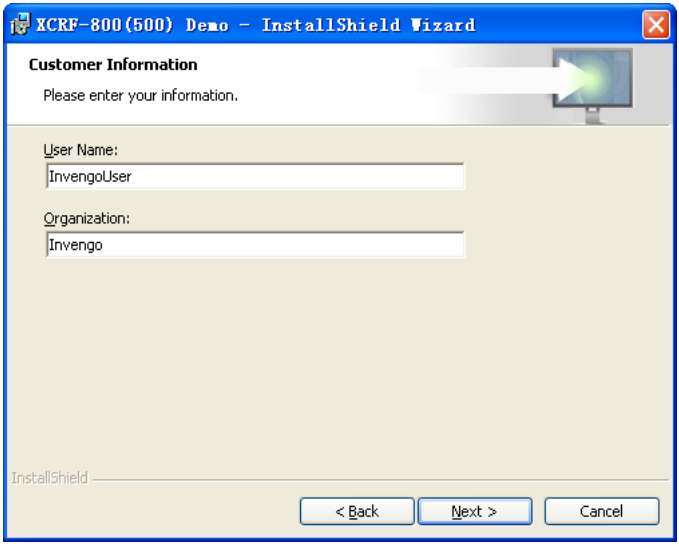
Program will display the following screen directly if .NET Framework 2.0 has been installed.



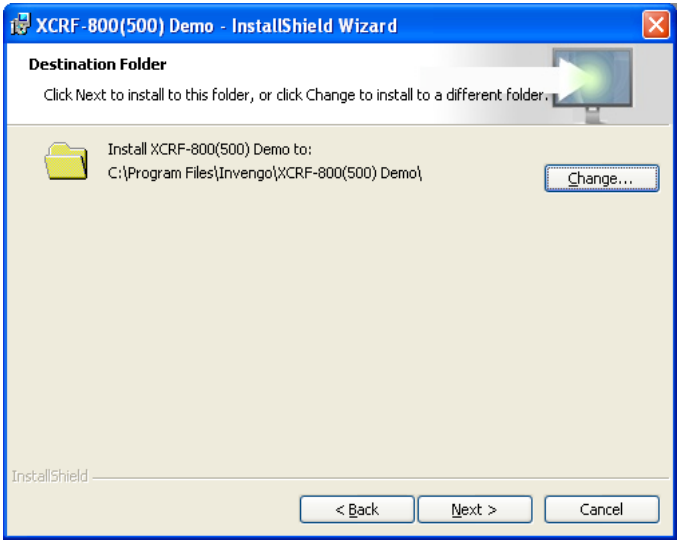
Click ‘Finish’.



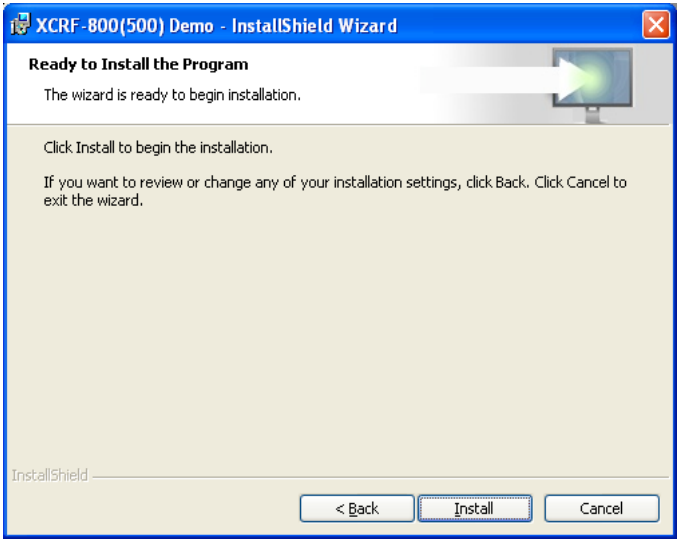
Click ‘Next’.



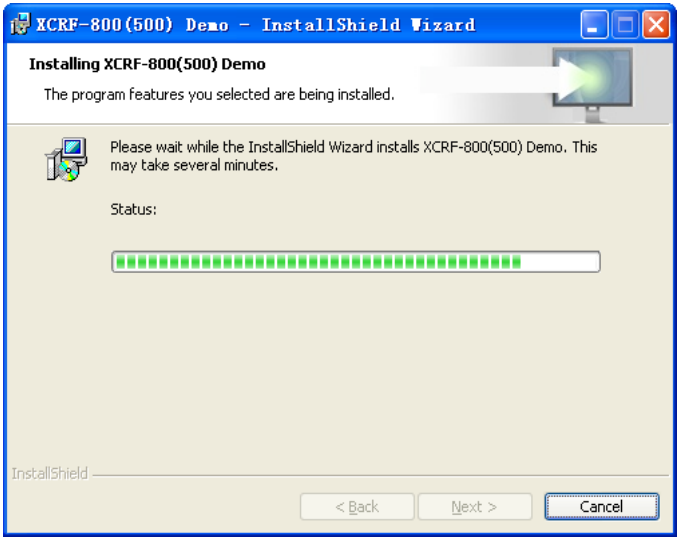
Please enter your information and click ‘Next’.

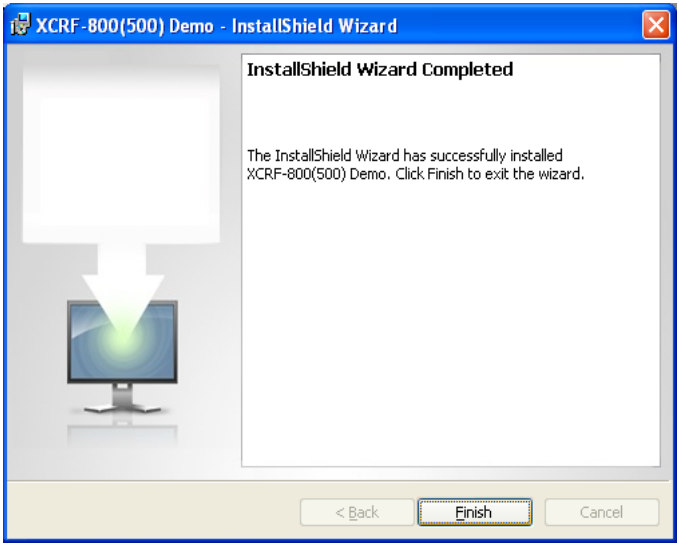


Select installation directory, click ‘Next’



Click ‘Install’

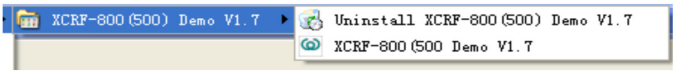




Click ‘Finish’ to close installation.

After successful installation, the desktop shortcut " "will appear

The appropriate Start menu shortcuts will appear, as shown:

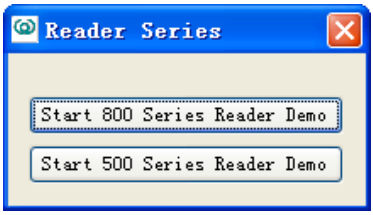


3 XCRF-800 Series Reader Demo User Manual

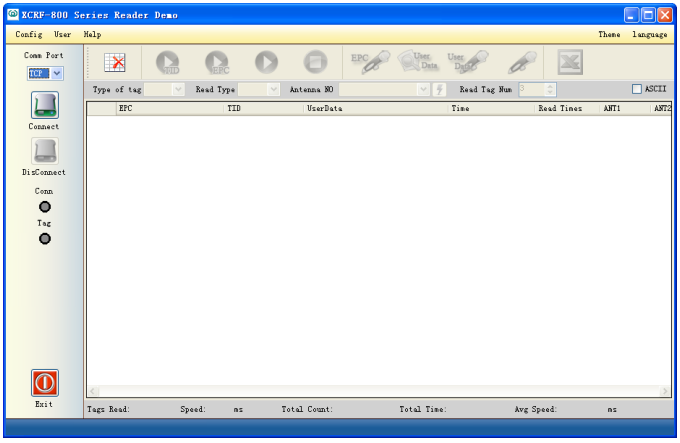
3.1 Running the read demo

Click [Start]—[Programs], select Invengo Demo v1.83 program group, and click 'XCRF-800(500) Demo v1.7' to run the XCRF-800(500) Series reader Demo. Or double click 'XCRF-800(500) Demo v1.83' on the desktop run the XCRF-800(500) Series reader Demo.

Click 'Start 800 Series Reader Demo':



The screen appears:



3.2 Connecting/disconnecting XCRF-800 Series reader

1. Selecting communication mode

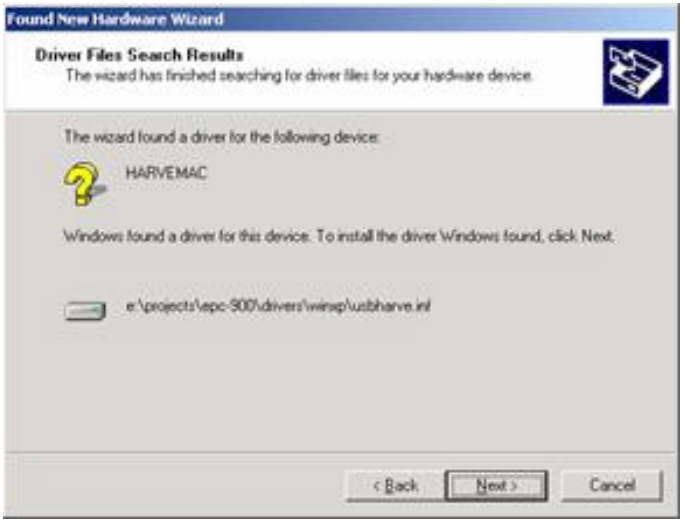
Three communication modes, including TCP/IP, COM (RS232) and USB, are available. Click 'Comm. Port' to select the desired communication mode.

Notice: USB option will be available when USB device and the driver are installed: Install the USB driver as follows:

Connect the reader with a USB cable, and apply power to the reader, the screen of 'new hardware found' appears.

Click 'Next'

Click ‘Next’



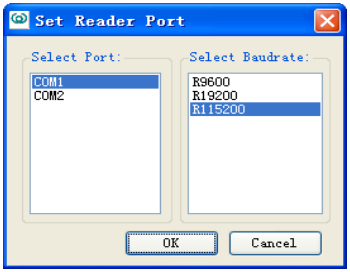
Click ‘Next’

Click ‘Finish’.

The message of ‘New hardware is installed and ready for use’ displays. When the installation of driver is completed, the computer can communicate with the XCRF-800(500) Series reader via USB port. 2. Click ‘Connect’ button after the desired communication mode is selected.

3. Configuring COM port parameters

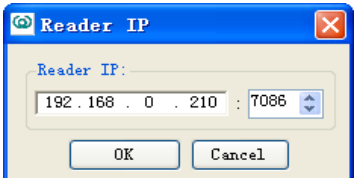
The communication mode COM should be selected. Select the desired COM port and baud rate as the screen appears below, and click ‘OK’ to connect the XCRF-800(500) Series reader.



4. Configuring IP address

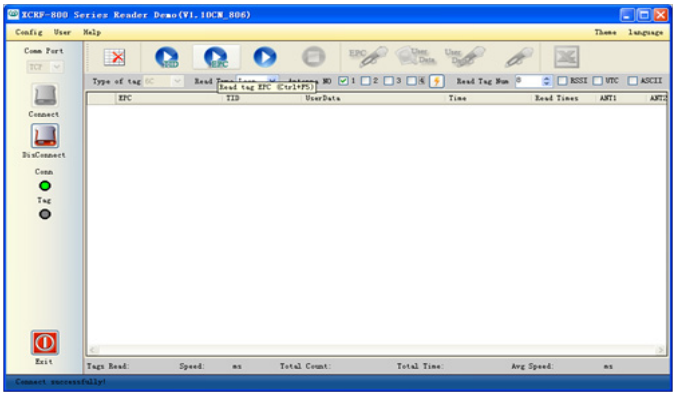
The communication mode TCP should be selected as the screen appears below. Input the reader’s IP address, and configure the PC network area which should be identical with that of the reader (defaulted as 192.168.0.210). The default port number is 7086. And click ‘OK’ to connect the XCRF-500 Series reader. When

the IP addresses of the PC and the reader are not in different segment, enter mapped IP address and port number or the reader and click “OK Connect” button to connect.



5. Successful connection

After the successful connection, the Conn icon on the following screen turns green, and the software status bar indicates that ‘successful connection’. The screen appears.



6. Connection failed

‘Connect failed’ message will appear on the software status bar.

7. Disconnecting the XCRF-800 Series reader

Click ‘Disconnect’ button, and the Conn icon turns gray. ‘Disconnected’ message will appear on the software status bar.

3.3 Read and write operation

1. Configuration before read and write operation

The screen appears:

Figure: for XC-RF861 Reader

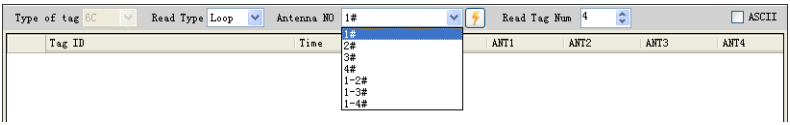


Figure: for other readers

Read mode: ‘Loop read’ and ‘Single read’

a) “single” mode: read only once, acquired tags will appear in the tag list.

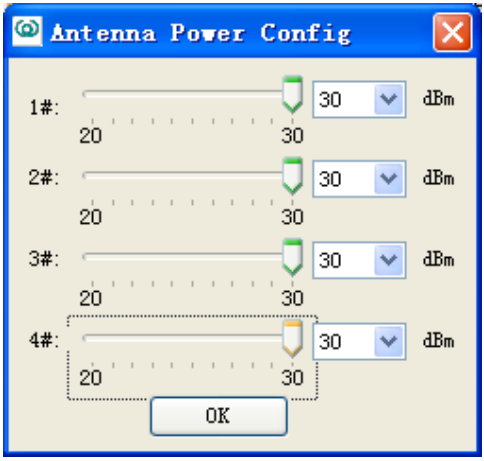
b) “loop” mode to read: continuously read tag operation will be performed until the stop read button is pressed. The acquired tags will show in the tag list.

The estimated numbers of tags to read: fill the estimated number of tags to write or read.

Antenna number: select the number of antenna that is connected.

(The XC-RF861 reader can use non-adjacent antennas. For example, as shown in the figure below, optional antenna No. 1 and 4 can be select to operate simultaneously, while the No. 2 and 3 antennas are not in operation. Other readers are able to use one antenna or multiple adjacent antennas.)

“ ”: Configuring antenna power. The screen appears.



Set the power antenna/s, and click “OK”.

RSSI: the antenna signal strength will display when selected. (Readers of specific models support this function.)

UTC: UTC time will display when selected. (Readers of specific models support this function.)

ASCII: ASCII format will be used to write tag data when selected; TID which is of 16 hex will be unaltered. 16 hex format will be used to write tag data when de-selected.

2. Read TID

Click’

‘to read TID number

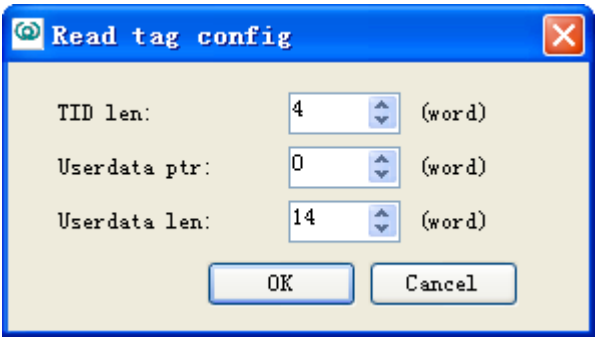
3. Read EPC number

Click’

‘button to read EPC number .

4.General read

Click“ ”button to config reading parameters.



TID len: specifies the length of the TID to read, usually set to 4 words (8 byte).

Userdata ptr: specifies the offset of the user data to read. Userdata ptr must be within the memory bank.

Userdata len: specifies the length of the user data to read. The sum of the offset and data length must be within the size of the memory bank.

Click “OK” to set.

5. Stop read

Click’ ‘Stop read tag (stop read tag operation of 2,3 and 4)

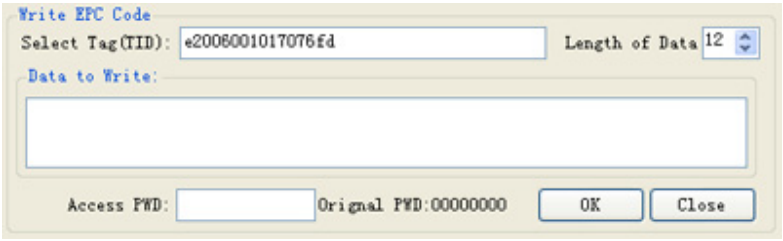
6. Read tag data result

Show the data. The screen appears.:

	Tag NO.	Time	Read Times	ANT1	ANT2	ANT3	ANT4	RSSI
▶ 1	e2006001011d6a1c	15:12:58	7	7	0	0	0	
2	e2006001011d6a06	15:12:59	8	8	0	0	0	
3	e2006001011d6a1d	15:12:59	3	3	0	0	0	
4	e2006001011d6a05	15:12:59	8	8	0	0	0	

7. Write EPC data

Select a data in the data list. Click ‘ ’ button and the screen appears:



Select tag (TID): click a data in the data list, and the TID number will be automatically added into the text box. (EPC number will be displayed in event of read EPC number.)

Write data byte: The length of data byte to write which is even number will be automatically calculated according the input characters.

Write EPC data: input the hexadecimal digit (A byte consists of two characters) or ASCII string in the text box. 0 will be automatically added if the number of input characters is odd.

Tag access password: input tag the access password, defaulted as ‘00000000’.

OK: confirm to write EPC data.

Close: close the write EPC data screen.

8. Read user data

Select a tag in the data list, click ‘ ’ button and the screen appears:

Select tag (TID): click the data in the data list and the TID number will automatically added to the text box.

Start address: in byte, start address is the start location for reading user data. (even number).

Data length: the data length is calculated from the start address, the byte number of the data to read (even number)

Tag user area data: read data results.

OK: confirm to read user area data.

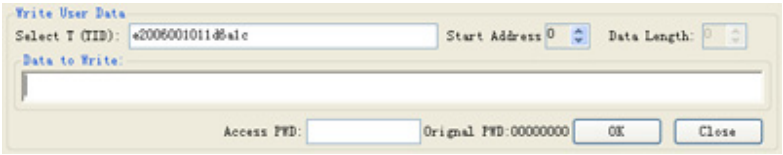
Close: close the read user data area screen.

Tip: EPC code defaults to 12 bytes. The length of EPC data area of tags from different vendors or of different models may vary, of which the maximum is 30 bytes.

Tip: “Start address” + “data length” should not exceed the maximum number of bytes of user data.

9. Write user data

Select the data is the list, click ’ ’ button, and the screen appears:



Select tag (TID): Select the data is the list, and the TID number will automatically be added to the text box. (If the operation is to read EPC, it will be the EPC number.)

Start address: in byte, the start address is the start point (even number) of the user data area to write.

Data length: the length will be calculated according to the input characters. The byte number of the data to write should be even.

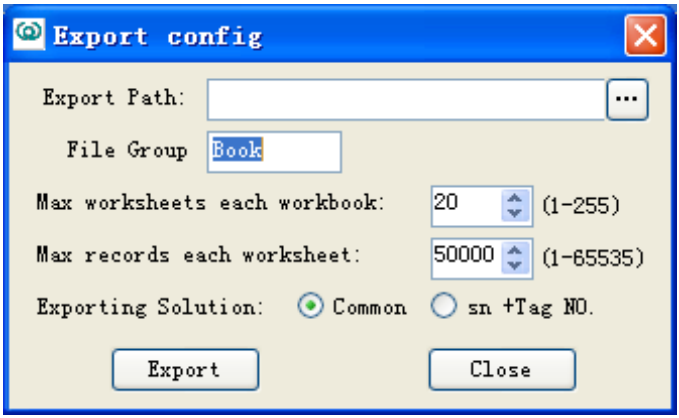
Write data: input the hexadecimal digit (A byte consists of two characters) or ASCII string in the text box. The number of characters input should not be odd, and should correspond with the byte number configured.

Write: Confirm to write the user area data.

Close: close the write user data area screen.

11. Exporting data

Click’ ’ button, and the screen appears:



Export Path: the directory to save the imported file. Click the ‘...’ button to explore the folders.

File Group: input the file names, and the files exported will be automatically named by adding a sequent number.

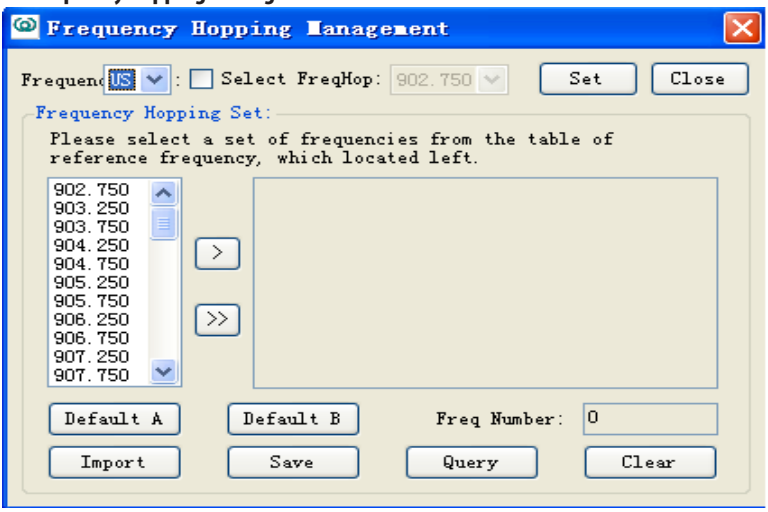
Export Solution: ‘Common’ enables the export of data listed in the box, and ‘sn + Tag NO.’ enables the export of sequence number + tag number.

Export: exporting data.

Close: close Export Config box.

3.4 Configuration menu

1. Frequency hopping management



a) Frequency range:

select 'CN', 'US' or 'EU' to switch the frequency range. If the frequency range is selected, the frequency of the reader will switch to the standard frequency of the selected region. (Not supported by all the XCRF-800 Series readers) ("CN": Chinese standard band; "US": North American Standard Band; "EU": EU standard band)

Selecting frequency hopping: select the desired frequency point in the frequency range box.

b) Configuring frequency hopping option:

The left list box includes the frequency point data of the frequency range, and the right box includes the frequency point list, showing the selected frequency point or frequency point query results.

>: add a frequency point to the frequency point list.

>>: add the frequency point in the list box to the frequency point list, or add the maximum frequency points that the XCRF-800 Series reader supports.

Default option A: showing the frequency point of default option A listed in the frequency point list.

Default option B: showing the frequency point of default option B listed in the frequency point list.

Frequency point number: listing the frequency point number in the frequency point list.

Import option: import the external frequency point options saved by demo software.

Storing option: store the frequency point of the frequency point list in the external option file.

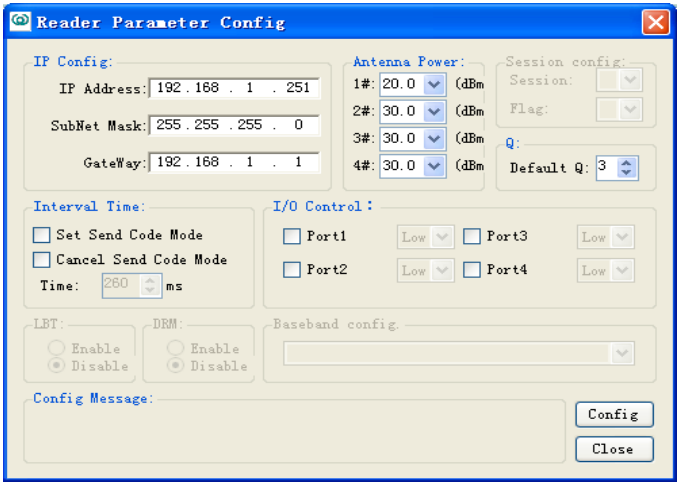
Querying frequency point: query the current operating frequency point of the XCRF-800 Series reader; show the current operating frequency point of the XCRF-800 Series reader in the frequency point list.

Clear: clearing the data of frequency point list will not change the configuration of frequency point.

Configuring: configure the data of frequency point list or the selected frequency point in frequency hopping selection list to the XCRF-800 Series reader.

Close: close the screen.

2. Frequency hopping management



The current configuration of the XCRF-800 Series reader display in the screen appears above. If one of the configurations is not available, it is probably caused

by failed query, possibly indicating the feature to operate is not supported. Close screen is recommended.

Configuring IP: modify the IP if needed

Adjusting antenna power: adjust if needed. Or select the desired value (20-30).

I/O control: configuring the ports.

Session config: configuring the session.

Q value: the XCRF-800 Series reader's default Q value.

Configuring Session: Inventory session and flag configuration

Code sending interval: the time interval the multiple readers require to send code which is supported by XCRF-804 only.

LBT: listen before talk.

DRM: dense reader mode switch.

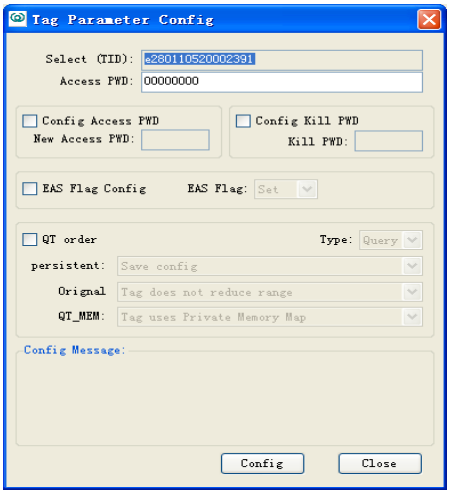
Baseband data rate: baseband data rate setting

Configuration status: Click the button to configure the operation, and execution result will be displayed.

Configuration: add the configuration data to the XCRF-800 Series reader.

Close: closing the screen.

3. Configuring tag parameters



Select a data is the data list. And the TID will automatically be added to the 'select tag (TID)' text box.

Select TID: The system will automatically add the number of selected tags to the "Select Tag (TID)" text box. Input the desired number of tags to operate.

Tag access password: input tag access password, the default is: '00000000'.

Configuring access password: select and input new password.

Configuring kill password: select and input new password.

Configuring EAS: select to configure or cancel EAS bit position configuration.

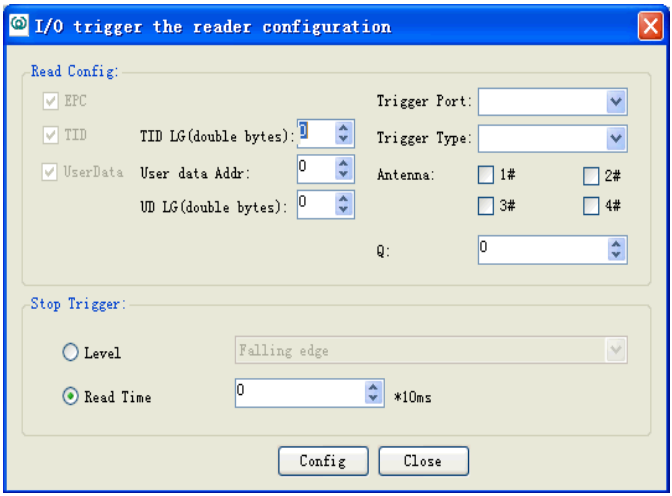
QT command: QT command can be queried and configured when selected. (Specific models of reader support this command.)

Configuring message: Click the Configure button to configure the operation, results will be shown

Configuring: configure the desired options.

Close: closing the screen.

4. Setting Read tag by I/O input trigger (applies to XCRF-807 reader)



TID LG (doule bytes): Enter TID length of the tag to operate.

User data Addr (double bytes): in byte, starting address for the user data area to read (even number).

UD LG (double bytes): enter the length of user memory (even number).

Trigger port: select the trigger port.

Trigger type: Never, falling edge, rising edge.

Antenna: select the number of antenna to operate.

Q: set the Q value when a read operation is performed.

The conditions to terminate read operation:

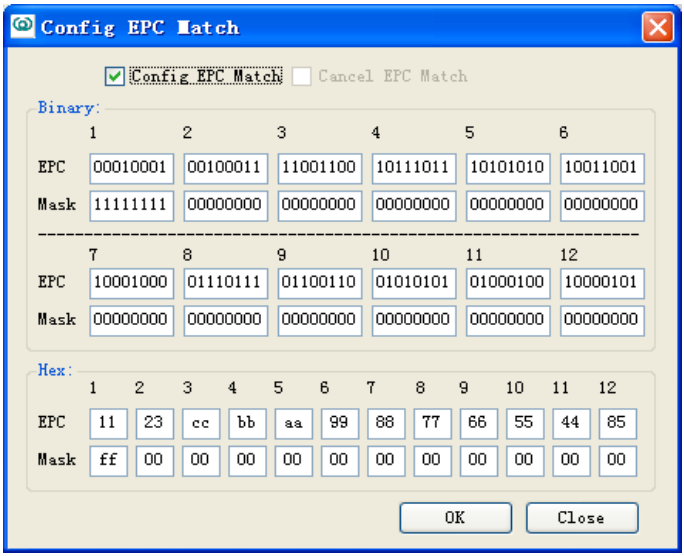
Level: the level of the input ports used to determine whether to stop a read operation.

Read time: read operation trigger, by a certain time interval delay, stop a read operation.

Config: save the configuration changes to the reader.

Close: close the window.

5. EPC matching configuration



Binary Code and hexadecimal digit are supported.

EPC: EPC number data.

Mask code: data to match, 0 indicates un-matched masked code.

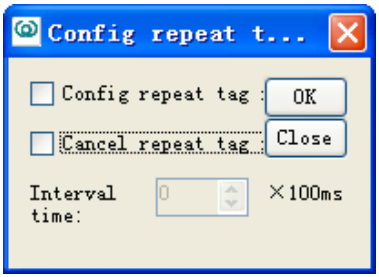
Configuring EPC matching: select the text box and edit.

Canceling EPC matching: select and cancel the matching.

OK: confirm or cancel the configuration according to the text box.

Close: closing the screen.

6. Filtering repeatedly acquired tag configuration.



Repeatedly acquired tags filtering by time interval can be configured or canceled.

Configuring repeated tag filtering: select and configure.

Cancel repeated tag filtering: select and configure.

Interval time: input or select the desired interval time.

OK: Configure or cancel configuration.

Close: closing the screen.

7. Setting reader clock

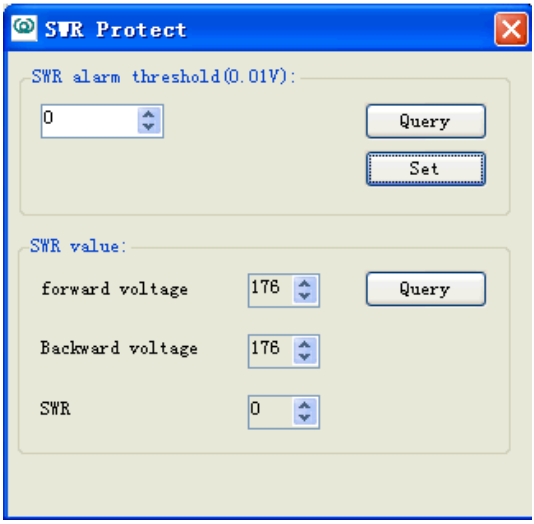
Reader clock can be set in the above screen.

Query: query the reader's current time.

Set: configure the reader's current time. Enter the current time directly in the input box or click the drop-down button to select the time in the input box.

Current time: the current time of PC is displayed if "now" is clicked.

8. VSWR protection (only applies to XCRF-807 reader)

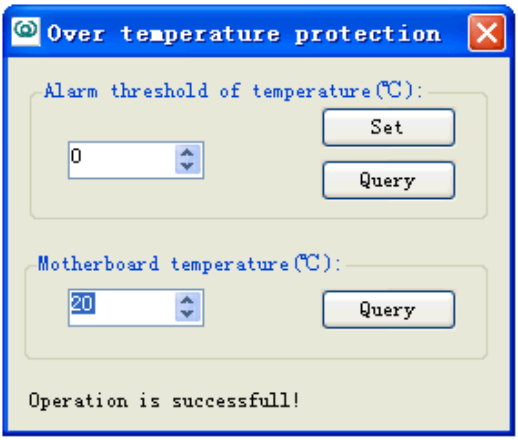


Query (VSWR warning threshold): Query the current standing wave ratio warning threshold

Set: Setting SWR warning threshold

Query (standing wave ratio): forward volatage, backward voltage, and standing wave ratio.

9. Over-temperature protection (only applies to XCRF-807 reader)



Set: The over-temperature warning threshold saved to the reader.

Query (over-temperature warning threshold): Query over-temperature warning threshold.

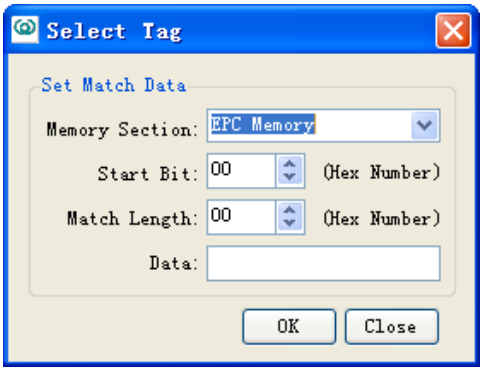
Query (Motherboard temperature): The current board temperature.

10. Close

Close the screen.

3.5 Function Menu

1. Select and read tags



Memory Section: select 'TID Memory', 'EPC Memory' and 'user Memory'

Start Bit: the start position of the memory, in byte.

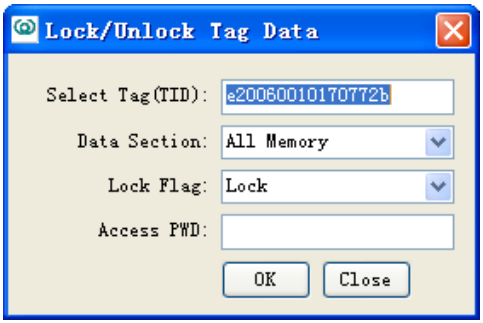
Match Length: matching per bit.

Memory Section: the section to match.

OK: confirm the configuration.

Close: close the screen.

2. Lock tag data area



Select the data is the list. The TID will automatically be added to the 'select tag

(TID)' text box. TIDs can be set by user.

Select tag (TID): input the tag TID.

Data Section: select 'All Memory' , 'TID", 'EPC' , 'user' , 'access password , or 'kill password' .

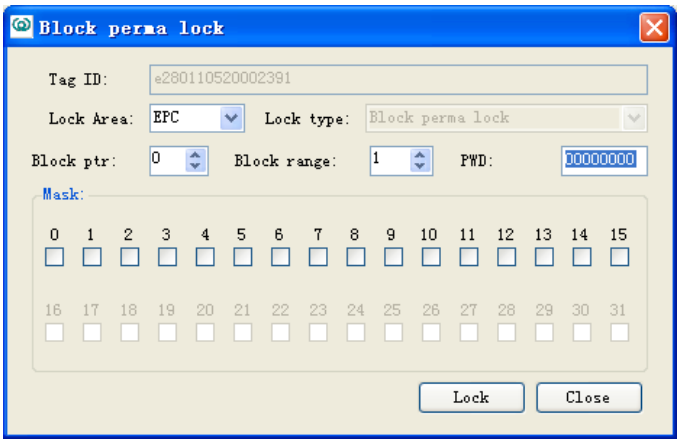
Lock Flag: select 'lock' or 'unlock'.

Access FWD: input tag access password. The default is: '00000000'.

OK: confirm configuration.

Close: close the screen.

3. Block Permanent Lock



Lock Area: select the block to lock.

Address of start block (BlockPtr) : 16 blocks comprise of a unit. 0x00 indicates that operation starts from block 0, and 0x01 indicates block 16.

Block permanent lock range (BlockRange): range of block permanent locks, from the starting block address (BlockPtr) to (16 * BlockRange-1), the minimum is 1.

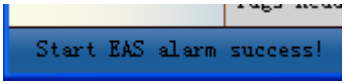
Mask (Mask): each one corresponds to a block for permanent lock operation. 1 performing a permanent lock, 0 maintaining the original lock state. BlockPtr Mask corresponds to the highest position, (16 * BlockRange- 1) corresponds to the lowest level.

Lock: to complete lock operation.

Close: close the screen.

4. Activate EAS Alarm

EAS alarm will be activated when specific tags in preset location are identified.

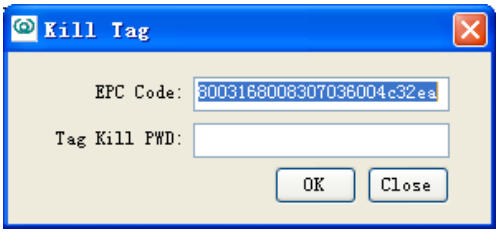
EAS enabled: 

Configuring EAS: See Section 3.4

Alarm setting: 1. Visual alarm; 2. Audio alarm.

Disabling EAS: click“ ”.

5. Kill tag



Select the data in the list. The EPC will automatically be added to the ‘EPC number ‘text box.

EPC Code: input the tag EPC.

Tag Kill PWD: input the tag access password. The default is: ‘00000000’.

OK: Confirm the configuration.

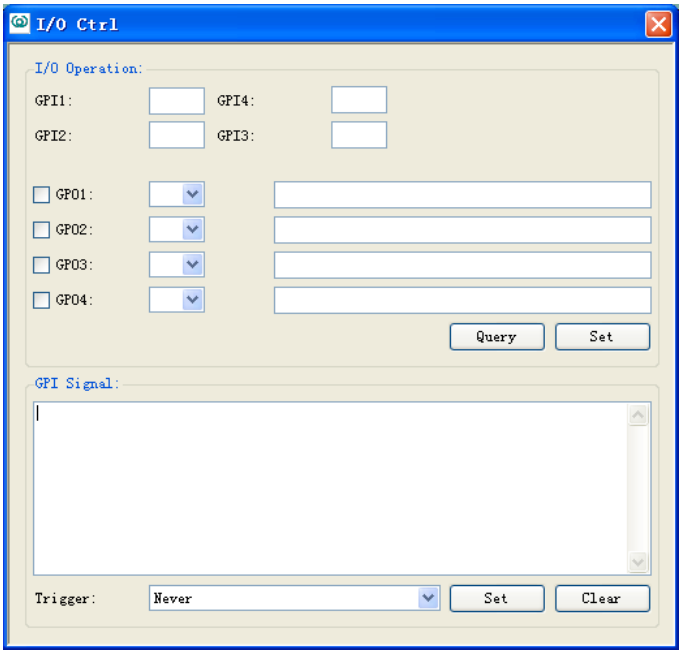
Close: close the screen.

6. Querying the XCRF-800 Series reader parameters.

Save: save the information in the external file.

OK: Close the screen

7. IO control (GPI signal monitoring applies to XCRF-807 reader)



Query: query info of I/O port.

Set: set the level of output port: high level or low level.

Set (GPI signal change monitoring): Monitoring GPI signal changes.

Trigger (GPI signal change monitoring):

Select the condition to trigger GPI signal change monitoring:

by level change

by falling edge

by rising edge

not to be triggered by level change

Clear (GPI signal change monitoring): Clear GPI signal change monitoring information.

8. Beep

A warning tone gives off during operation when it is enabled. For example: a beep tone gives off when read tag is performed.

4 Troubleshooting

1 Serial Port Connection Failure

Check whether the COM port of the reader is connected with the corresponding port. The serial link baud rate of computer and reader must be identical with that of reader. Whether the serial port cable is correctly connected. Disconnection or loose connection may disable the instructions from the computer to the Reader;

2 Network Port Connection Failure

The default IP address is 192.168.0.210. The connection between the Reader and PC can be established if the PC's IP address and Reader's IP address are in the same network, segment (e.g. 192.168.0.XXX), or of connected networks, The Reader IP can be set by using Demo software in a computer with RS-232 serial port if the IP address is missing.

3 USB Port Connection Failure

Check whether the PC has identified such USB Device. If identification is failed, please install USB driver by referring to Section 3.2.

Check whether the USB cable is correctly connected, as disconnection or loose connection may disable the instructions from the computer to the Reader.

4 Unable to Read Tags

Check the serial port cable, USB cable or network cable is correctly connected. Disconnection or loose connection may disable the instructions from the computer to the Reader.

Check whether the antenna's SMA connector is tight, and whether the tag is damaged.

Whether the Antenna number on the main interface is correctly selected and whether it is identical with port number of external antenna.

Whether the 'Number of Tags to be Read' is correctly set. (It shall be approximate to the number of the tags within the antenna's coverage)

5 How to operate readers remotely?

Reader is equivalent to a network terminal. Demo software can be connected with IP address port (For connecting XCRF-800 Series reader see IP connection of 3.2; for IP address settings, see 3.4 in reader parameter settings; for connecting XCRF-500 Series reader, see IP Settings of 4.2; IP address settings, see 4.4 IP settings; reader port number is fixed at 7086); the reader can be operated when connection is established .

6 Must IP address range be reserved for reader?

Every reader needs an IP. IP address of reader can be set, ensuring that there is not |IP address conflict between reader and other network devices. Reader does not automatically check the IP conflict.

7 How to cancel configuration parameters operation, such as: access password, kill password, and EAS?

For setting access password and kill password, see 4.3.9 and 4.3.10. Access password and kill password will be valid when Locking tag (4.3.11) is completed. For EAS configuration settings see 4.3.13, 4.3.14 and 6.1.14. Only one tag will set off alarm when EAS function. In other words, EAS is designed to set off on the alarm of the EAS tag with EAS.

8 How to set the EPC matching?

EPC matching is valid for the 12-byte EPC number. EPC matching instructions include three parameters; one to set or cancel the parameter, one to match EPC parameter, and one to match mask parameter. Matching is based on bit match. Matching a mask of which one bit is 1 will be effective. Matching a mask of which one bit is 0 will not be effective. For example, to read the EPC of which the first 2 bytes is “1234”, set the parameters to match the EPC code as “12340000000000000000” (16 hex), and set the matching mask parameter as “ffff00000000000000000000” (16 hex). This configuration enables the acquisition of tags of “1234 **********”.

For additional information, contact your Invengo representative.

Appendix

The CD-ROM contains setup installer, USB driver, API (including Invengo.ConfigFileClass.dll, Invengo.Order.dll, Invengo.XCRFAPI.dll, Invengo.XCRFReader.dll, log4net.dll, FreqType.xml, language folder) and so on.

API interface function is the interface platform for the reader and background software which provides help for system integrators and end users. For addtional information on API interface function, please refer to .NET API Technical Reference Manual.

Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
NOTE: This equipment 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 equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
-- Reorient or relocate the receiving antenna.
-- Increase the separation between the equipment and receiver.
-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-- Consult the dealer or an experienced radio/TV technician for help.

RF Exposure Statement

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

Corporate Headquarters
Invengo Information Technology Co., Ltd.

3/F, No.T2-B, High-tech Industrial Park South,
Shenzhen 518057, China

www.invengo.cn

Tel: (86) 755 26525585
Fax: (86) 755 26525277

intl@invengo.cn

US Subsidiary
Invengo Technology Corp.

12801 Worldgate Drive, Suite 500
Herndon, VA 20170 U.S.A

www.invengo.com

Tel: 1 703 793 0085
Fax: 1 703 871 3901

sales@invengo.com