

D-100 Desktop reader

User guide



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1 D-10X View



1-1: Front View



1-2: Back View



1-3: Plan View

2 Packing list

The D100 box must contain:

UHF reader D-100

1 cable USB

1 GPIO adaptor



3 Initial Use

3.1 Step 1: Connect the reader to PC via USB or Serial Port

3.1.1 Method NO.1: connection via USB

You can connect the reader to your PC via USB Cable, as illustrated below:



Next, please switch the DIP to the position as illustrated below:



3.1.2 Method NO.2: connection via RS-232

You can also connect the reader to PC via RS-232 serial port, as illustrated below:



Next, please switch the DIP to the position as illustrated below:



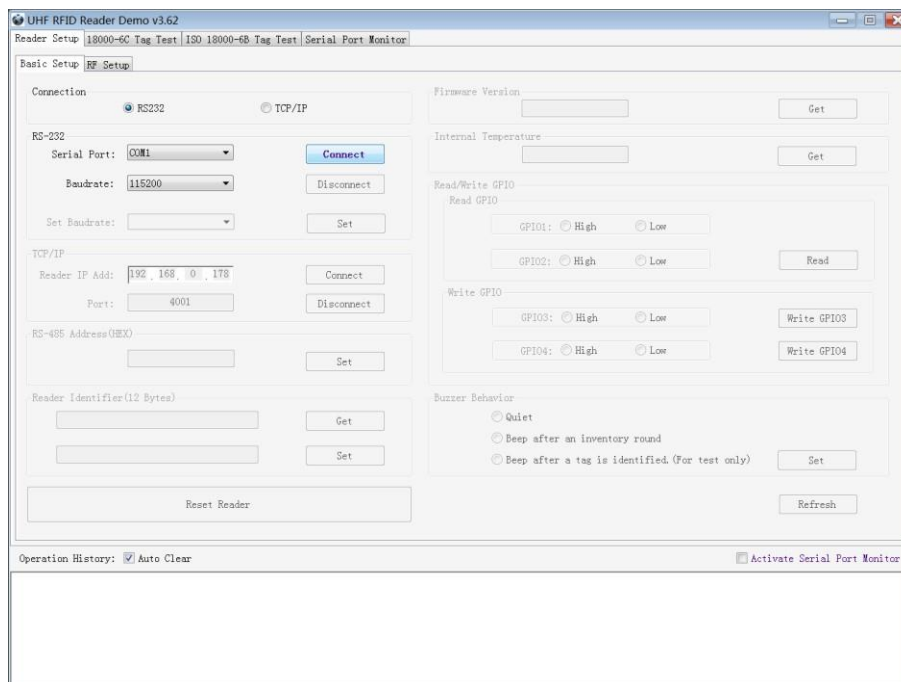
When the indicator turns on and a short beep sounds, the player is ready.

Note: The driver will be installed automatically when the reader is connected to the PC for the first time. But some computers can fail. In this case, please install the driver manually. (see: Driver installation on page 21).

3.1.3 Step 2: operating Reader via Demo

Put the files that named **UHFDemo.exe**, **reader.dll**, **customControl.dll** into a same folder, and double-click **UHFDemo.exe** to run the software.

1. Open the software and it will be displayed as follows:



2. Select RS232 as Connection if the reader is connected via the RS-232 port, or select USB as Connection if the reader is connected via USB. Choose the serial port and the corresponding baud rate (the default baud rate is 115200) as shown below:

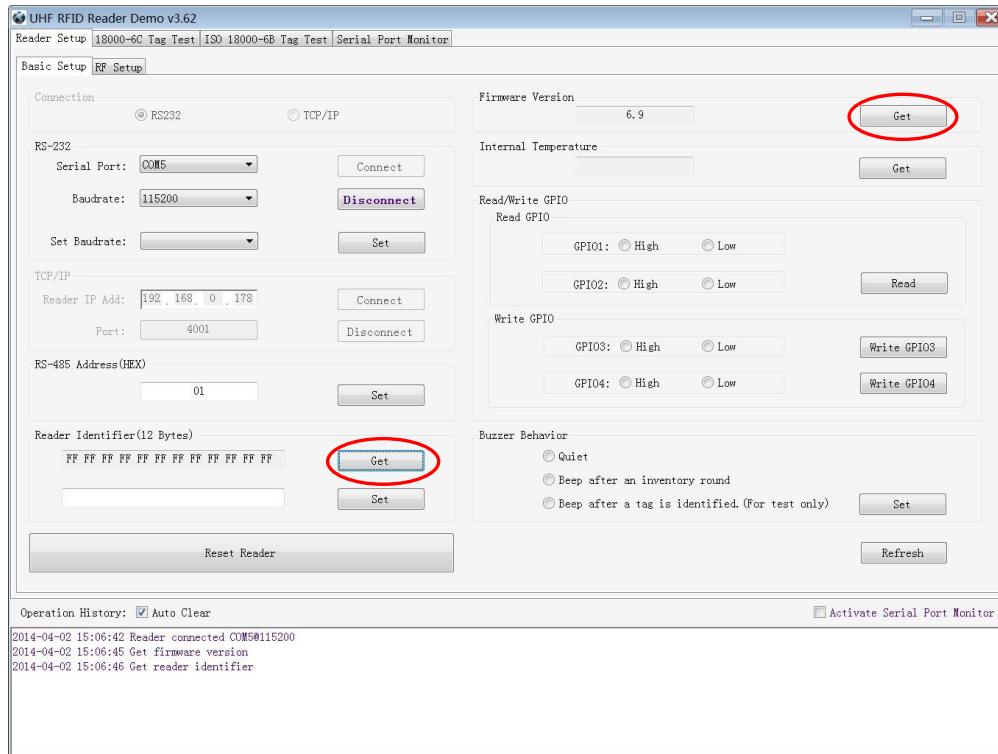


3. Click **Connect**, if it succeeds, the **Operation History** will be shown as below:



4. Text communication with the reader:

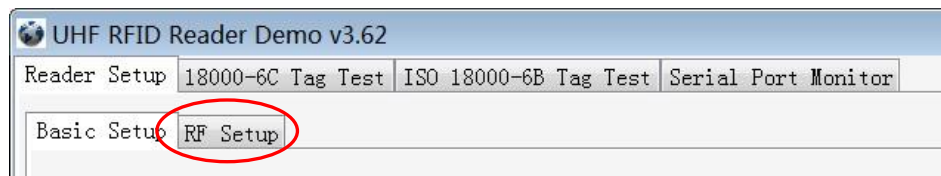
Click on **Get** in **Firmware Version** or in **Reader Identifier**. The following screen displays:



The reader has been successfully connected to PC.

3.2 Setting RF Parameter

After connecting the reader with PC, some basic RF parameters need to be configured: RF Output Power & RF Spectrum. To do so, select **RF Setup** as illustrated below:



3.2.1 Setting RF Output Power

RF Output Power is the strength of RF output signal from antenna port whose unit is dBm.

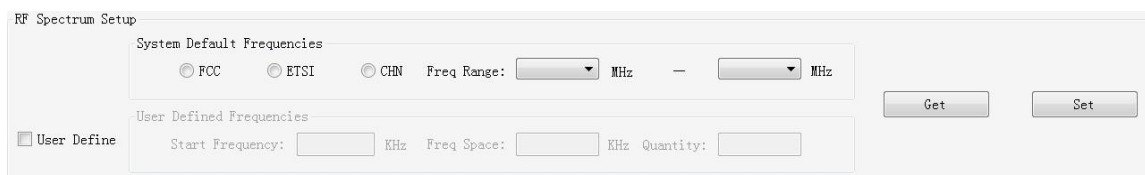


The output power range is from 18 to 26dBm. When this setting is complete, it is automatically saved in the reader, even if the power is turned off. The default output power is 26 dBm.

3.2.2 Setting RF Spectrum

The RF spectrum must be configured manually.

- For more information on carrier frequency, refer to the frequency parameter tablet in the communication protocol.
- Frequency range supported by the reader: 865MHz-868MHz (ETSI), 902MHz - 928MHz(FCC). You can set the player in RF **Spectrum Configuration->User Definition**, as shown below:



The dialog box titled "RF Spectrum Setup" contains two sections. The "System Default Frequencies" section has three radio buttons: FCC, ETSI, and CHN. To the right of these are two frequency range input fields labeled "Freq Range:" and "MHz". The "User Defined Frequencies" section is below and includes a checkbox labeled "User Define". To its right are three input fields: "Start Frequency:" (labeled "KHz"), "Freq Space:" (labeled "KHz"), and "Quantity:". On the far right of the dialog are two buttons: "Get" and "Set".

Users can set RF spectrum via these three parameters: Start Frequency, Frequency Interval, The number of Frequency points.

3.3 ISO-18000-6C tag inventory

Connect the Reader. The Tag operation can be started when the RF setup is complete.

The Tag inventory means that the reader identifies several tags' 'EPC number' at the same time. This is the central function of the UHF RFID reader and one of the standards for judging the performance of a reader.

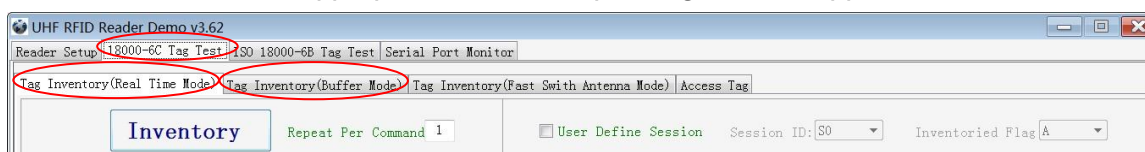
3.3.1 Real Time Mode & Buffer Mode

The most commonly used mode for tag inventory is **Real-time Mode**. Data will be uploaded meanwhile you can get the tags'EPC number instantly. **RSSI** and **Parameter of Frequency** are changed and recorded in real time. Due to its dual CPU architecture, performance of multi-tag identification under **Real-time** mode is the best.

The other mode is **Buffer Mode**. Data is cached and downloaded for viewing if necessary. In this mode, the data is not downloaded several times. However, data filtering takes some time for the reader. As a result, its identification efficiency will be slightly lower than that of the real-time mode.

Note: tags cannot be used when you extract data from the cache.

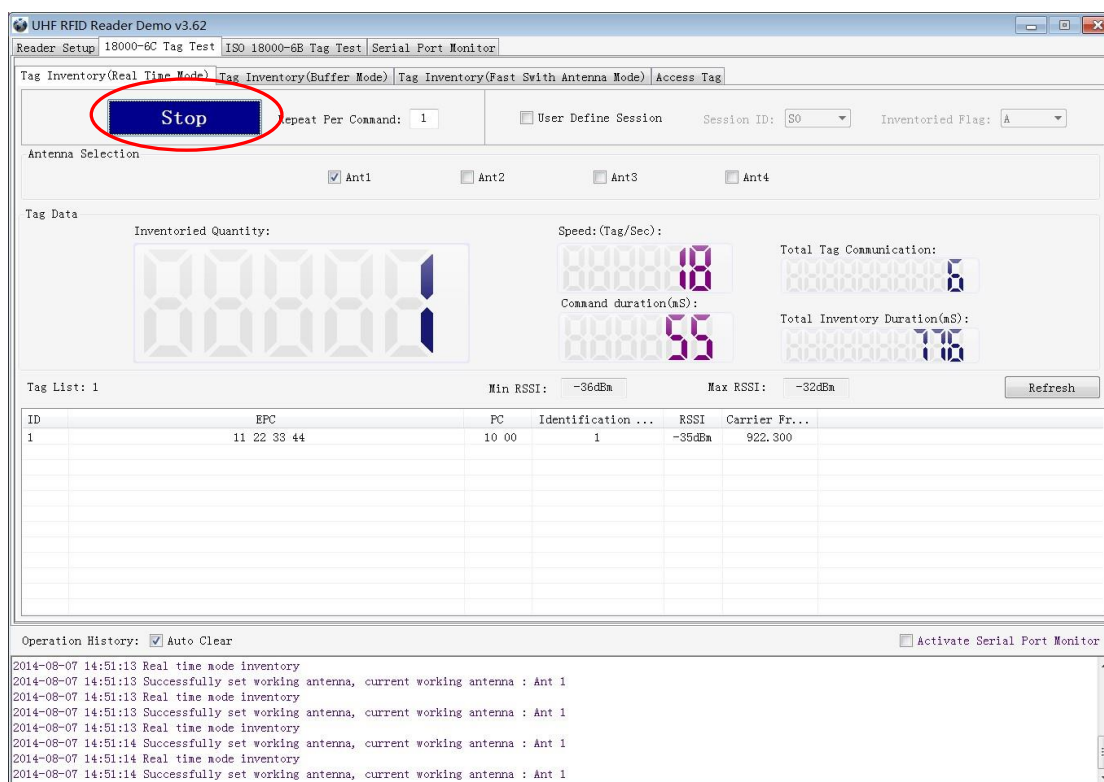
Users can choose the appropriate method depending on their application, as shown below:



3.3.1.1 Real-time Mode

1. Click **Tag Inventory (Real Time Mode)**. Select the connected antenna(s) ports. Set the number of **Repeat Per Command**, which is the times of repeat inventory command. For example, inventory command will execute anti-collision algorithm one time when you set the value to 1. It will execute anti-collision algorithm two times when you set the value to 2...
2. Click **Inventory**, you will find that the EPC number is uploaded immediately, and it is real-time updating.

The reader will keep inventory until you click **stop** as shown below:

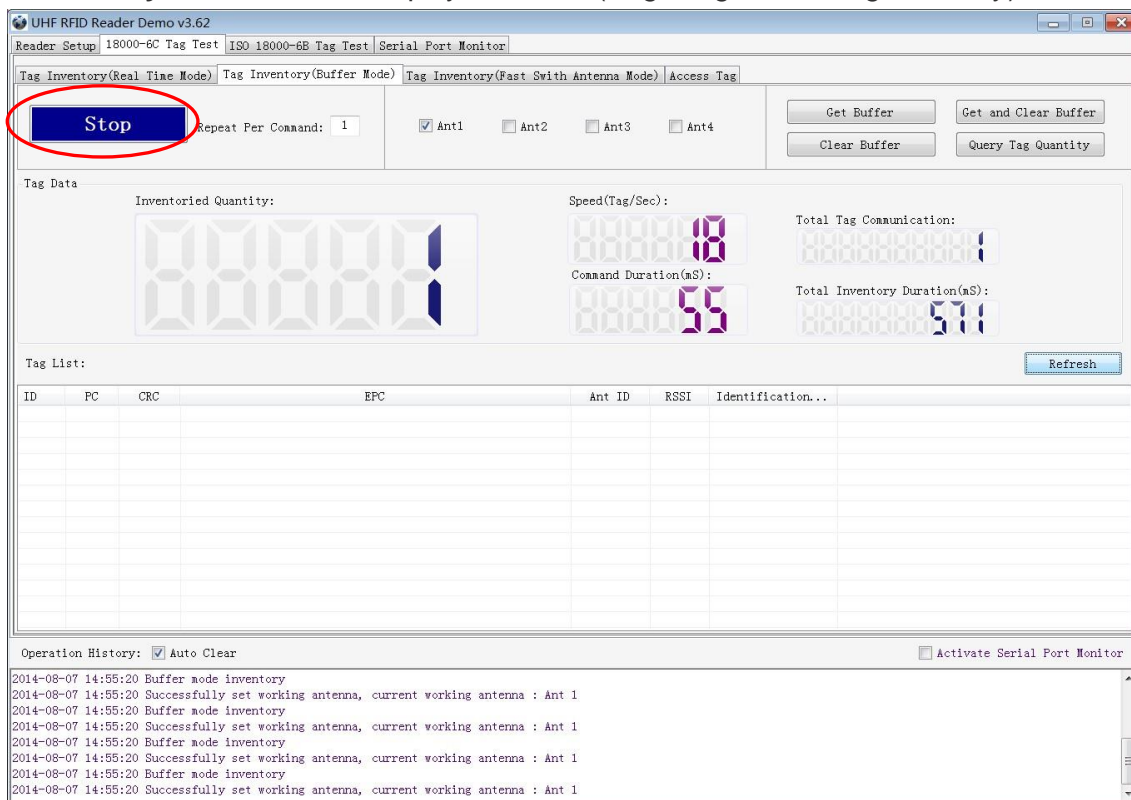


Inventoried Quantity	Total number of inventory tags since click on Inventory .
Speed	Speed of identification Tag, unit: piece / sec
Total Tag Communication	Total return EPC data of tags (Including repeated data)
Command Duration	Time of each inventory command takes, unit: ms
Total Inventory Duration	Total elapsed time since click on Inventory , unit: ms.
ID	The serial number of data.

EPC	EPC number of tag.
PC	Protocol Control word of tag.
Identification Count	Times of tag identified.
RSSI	The signal strength when tag was identified at the last time.
Carrier Frequency	Carrier frequency of tag which is identified at the last time.

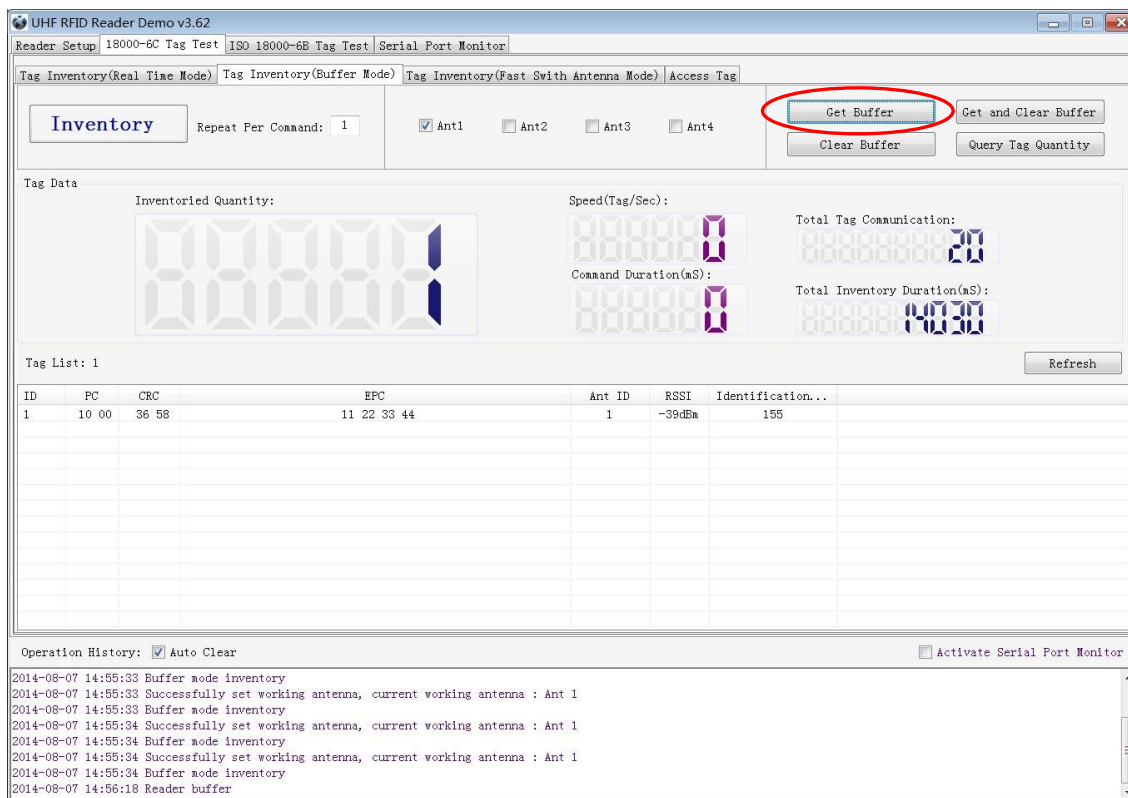
3.3.1.2 Buffer Mode

1. Click **Inventory**, the screen will display as below (single tag & multi-tag inventory):



Note: the identified tags will not be shown in the **Tag list**.

2. Click **Stop** first, then click **Get Buffer**. All the data in cache will be uploaded as illustrated below:

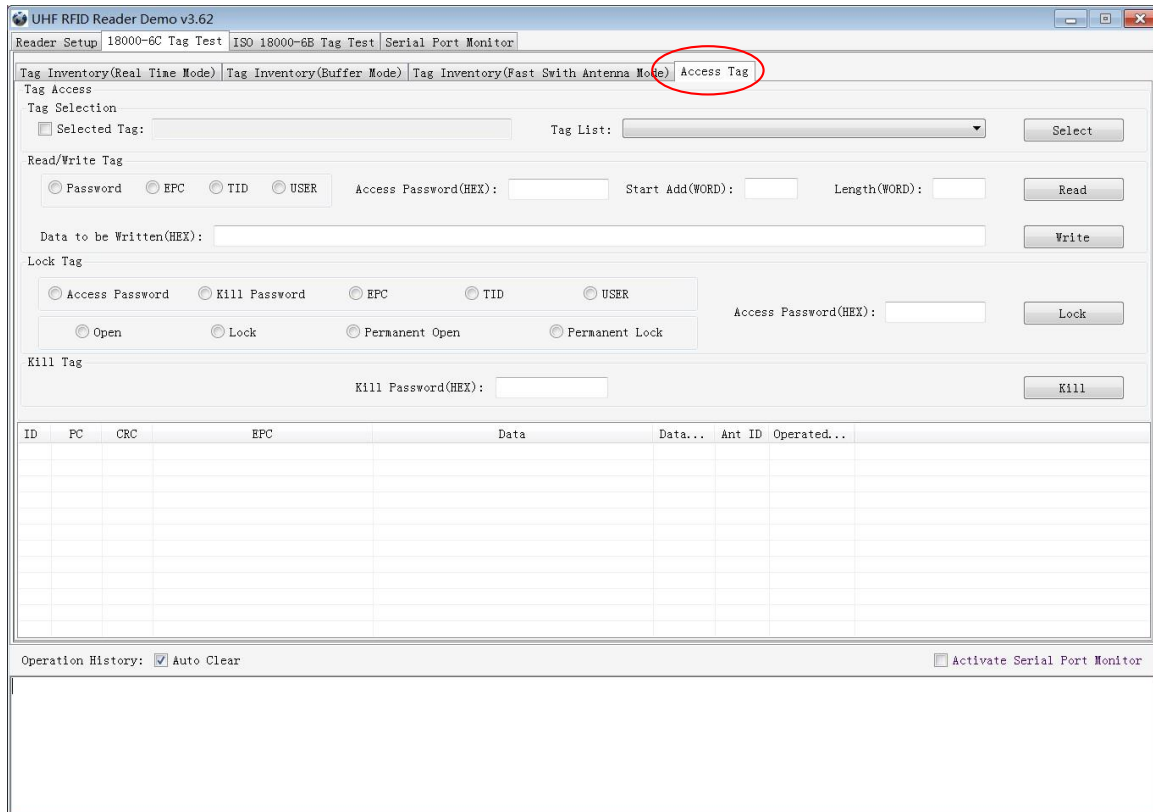


Descriptions of functions under Buffer Mode:

- **Get and Clear:** read the cache of the data form, then clear the cache. It will be empty when you read the cache again.
- **Query tag Quantity:** to know only the number of tags in the cache, click on this button.
- **Clear Buffer:** clear the cache and refresh the screen.

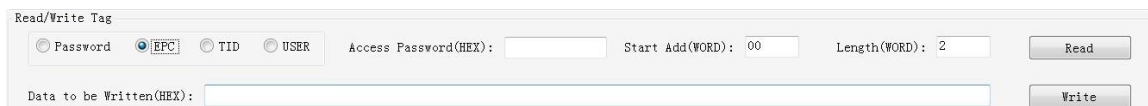
3.4 Accessing ISO-18000-6C Tag

Click **Access Tag**, and the screen will display as following:



3.4.1 Read tags

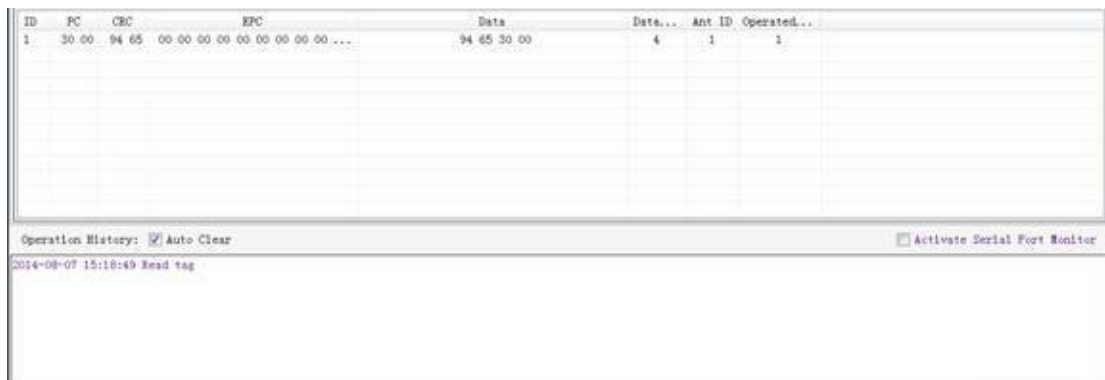
Parameters can be configured (zones to be read, Start Address and Data Length) as below:



Note: the unit of starting address and data length is WORD which is 16 bit double-byte.

Click **Read** when the parameter setting is completed.

Picture as below shows that one tag has been identified successfully.



The area of Write Tag is the same as Read Tag, but you need to provide access password and information of data to be written.

Read/Write Tag

☐ Password ☒ EPC ☐ TID ☐ USER Access Password(HEX): 00 00 00 00 Start Add(WORD): 02 Length(WORD): 4

Data to be Written(HEX): 11 22 33 44 55 66 77 88

[illegible]

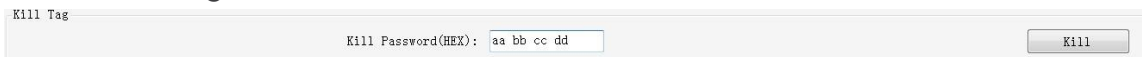
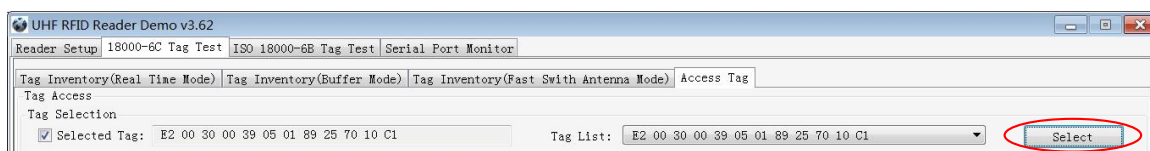
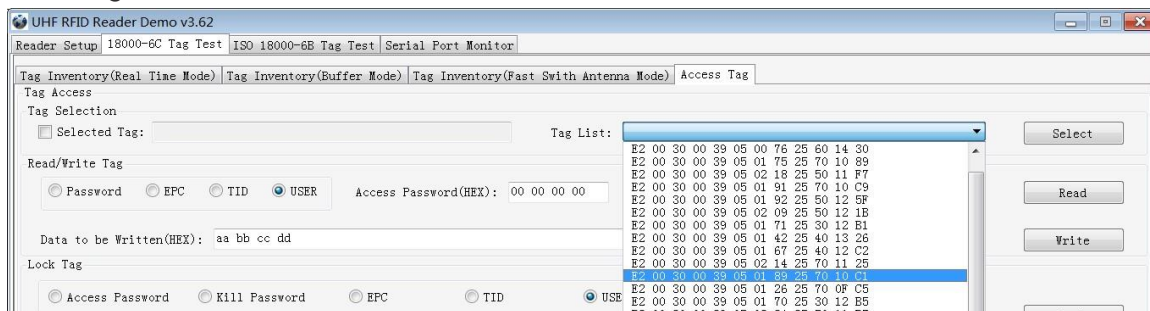
Lock Tag

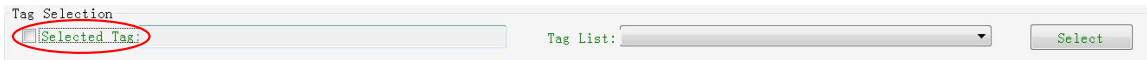
☐ Access Password ☐ Kill Password ☐ EPC ☐ TID ☒ USER

☐ Open ☒ Lock ☐ Permanent Open ☐ Permanent Lock

Access Password(HEX):

[illegible]

[illegible]

A screenshot of a software interface titled "Tag Selection". It features a text input field on the left containing the text "Selected Tag:", which is circled in red. To the right of this field is a "Tag List:" label followed by a dropdown menu. Further to the right is a green button labeled "Select".

3.4.6 Error Display

Errors occur if incorrect operations are performed:

- **Inventory success, access failure:**

A screenshot of a software window titled "Operation History". It has a checkbox for "Auto Clear" (checked) and a checkbox for "Activate Serial Port Monitor" (unchecked). The main area displays a red error message: "2014-04-10 14:57:41 Read tag failed, due to Tag Inventoried but access failed".

La capture d'écran montre 1) inventaire réussi mais 2) échec d'accès aux tags

The reasons to this error could be the following:

1. Parameters are incorrect: for example, zones (password/ EPC/ TID/ User) to be read do not exist.
2. Tags are beyond the area that the RF covers: the distance to access to tags is about 60%-70% of tag inventory; in this case, put the tag closer to the antenna.

- **Wrong password:**

A screenshot of a software window titled "Operation History". It has a checkbox for "Auto Clear" (checked) and a checkbox for "Activate Serial Port Monitor" (unchecked). The main area displays a red error message: "2014-04-10 17:21:40 Write tag failed, due to Access failed or wrong password".

In this case, wrong password has been set.

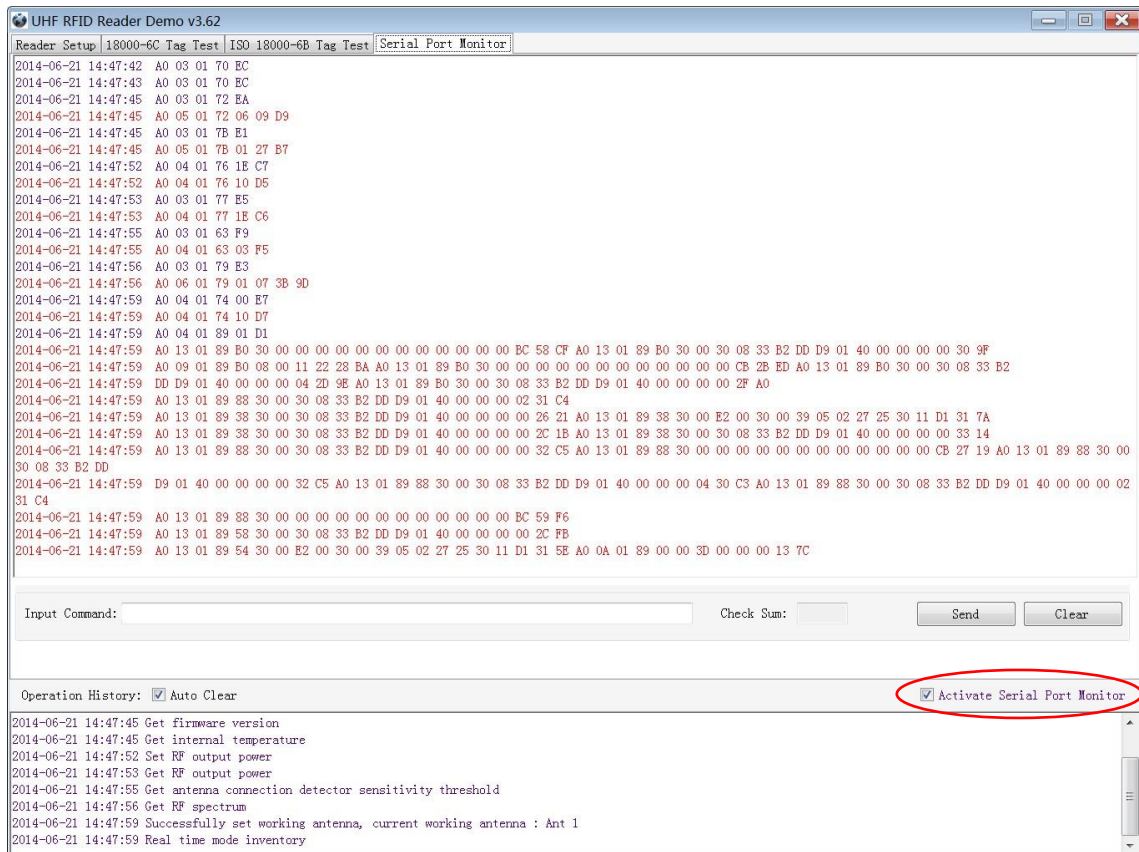
- **No tags to be operated:**

A screenshot of a software window titled "Operation History". It has a checkbox for "Auto Clear" (checked) and a checkbox for "Activate Serial Port Monitor" (unchecked). The main area displays a red error message: "2014-04-10 17:32:52 Lock tag failed, due to There is no tag to be operated".

This error is since the tags are beyond the area that the RF covers.

4 Develop your own RFID Application

Most functions of the reader can be operated through the demo. To develop your own application, refer to the document **Commands Definition**. Demo provides an important function of recording serial transmission, so that users can quickly grasp the content of communication protocol in practice. Please defer to the screenshot below and select **Activate Serial Port Monitor**, all uplink and downlink serial data will be recorded, as illustrated below:

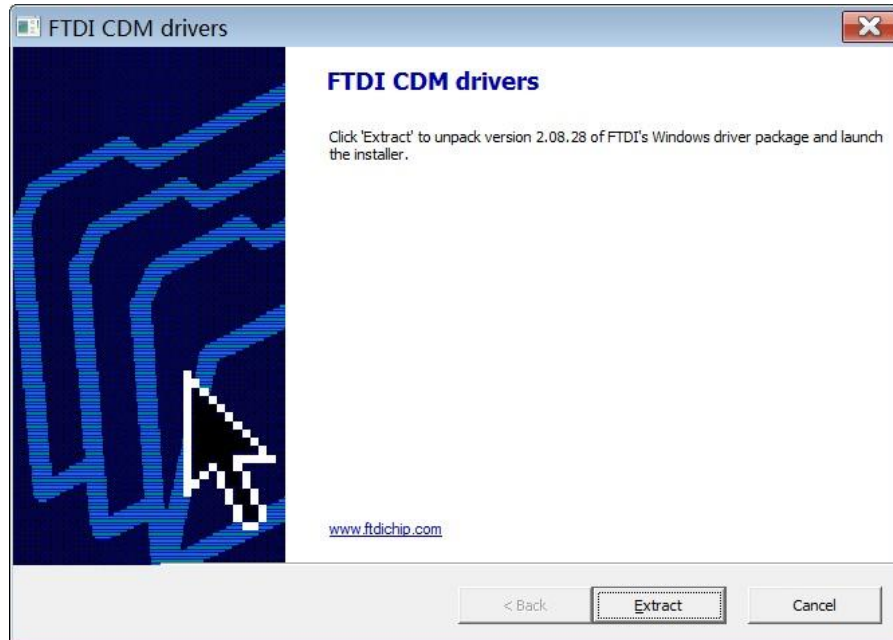


Notes:

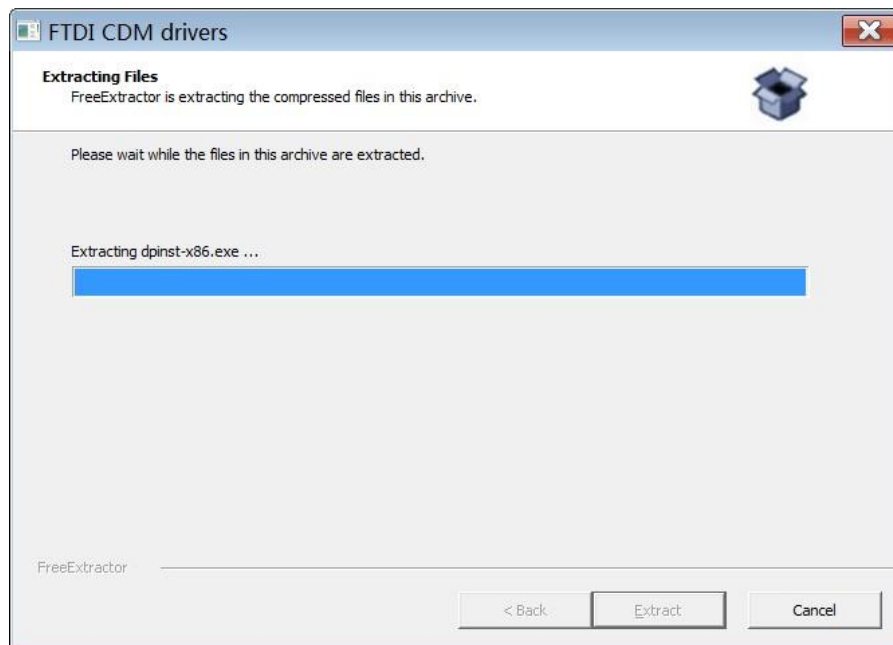
- Response speed of Demo will slow down after opening the **Activate Serial Port Monitor**. Please turn off this function when it is not needed.
- Data in violet blue color is sent to the reader by PC, and data in red color is the returned information from reader to PC.
- Manual **Input Command** is used to debug serial command, which could calculate the checksum automatically.

5 Installing Driver

1. Open the D-100 Driver folder.
2. Double click on CDM20828_Setup.exe, the following screen displays:



3. Click on Extract:



After installation is complete, the reader is successfully connected to PC.

6 FCC Statement

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.