

# D-10X Desktop UHF RFID Reader

## User Manual v1.1



# Catalogue

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## 1. D-10X View



### 1-1: Front View



### 1-2: Back View



### 1-3: Plan View

## 2. Reader Configurations

### 2.1 Initial Use

#### 2.1.1 Step 1: Connect The Reader to PC via USB or Serial Port

**Method NO.1:** 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:



**Method NO.2:** 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:



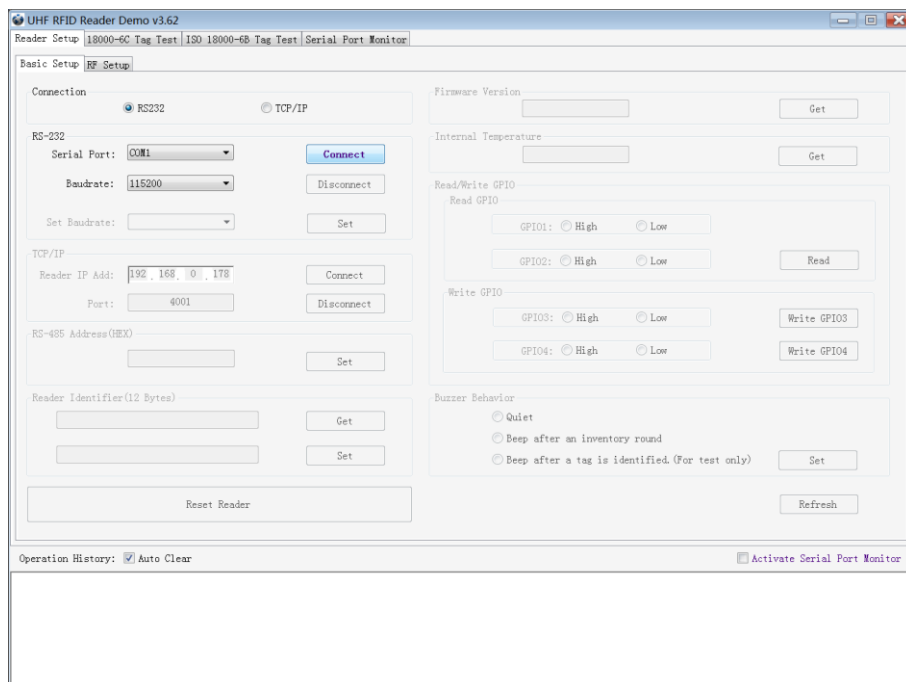
When the indicator light on and sound of a short beep, reader is ready.

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

### 2.1.2 Step 4: 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 shows as below:



2. Please select **RS232** as **Connection** if the reader is connected via RS -232 port, or select **USB** as **Connection** if the reader is connected via USB. Choose the corresponding **Serial Port** and **Baudrate** (default baudrate is 115200). As illustrated below:

Connection

☒ RS232 ☐ TCP/IP

RS-232

Serial Port: COM1

Baudrate: 115200

Connect

Disconnect

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

Operation History: ☒ Auto Clear ☐ Activate Serial Port Monitor

2014-04-02 14:48:59 Reader connected COM5@115200

4. Text communication with the reader:

Click on **Get** in **Firmware Version** or in **Reader Identifier**, the following screen displays:

UHF RFID Reader Demo v3.62

Reader Setup | 18000-6C Tag Test | ISO 18000-6B Tag Test | Serial Port Monitor

Basic Setup | RF Setup

Connection

☒ RS232 ☐ TCP/IP

RS-232

Serial Port: COM5

Baudrate: 115200

Set Baudrate: [dropdown]

Connect

Disconnect

Set

TCP/IP

Reader IP Add: 192.168.0.178

Port: 4001

Connect

Disconnect

RS-485 Address(HEX)

01

Set

Reader Identifier(12 Bytes)

FF FF FF FF FF FF FF FF FF FF

Get

Set

Reset Reader

Firmware Version

6.9

Get

Internal Temperature

Get

Read/Write GPIO

Read GPIO

GPIO1: ☐ High ☐ Low

GPIO2: ☐ High ☐ Low

Read

Write GPIO

GPIO3: ☐ High ☐ Low

GPIO4: ☐ High ☐ Low

Write GPIO3

Write GPIO4

Buzzer Behavior

☐ Quiet

☐ Beep after an inventory round

☐ Beep after a tag is identified. (For test only)

Set

Refresh

Operation History: ☒ Auto Clear ☐ Activate Serial Port Monitor

2014-04-02 15:06:42 Reader connected COM5@115200

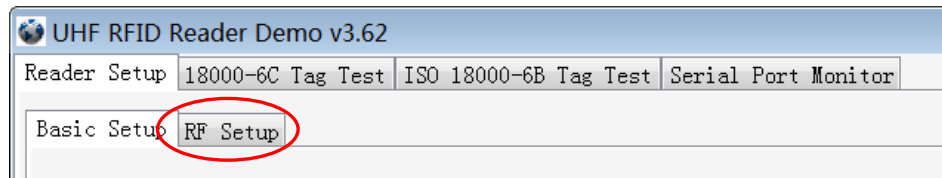
2014-04-02 15:06:45 Get firmware version

2014-04-02 15:06:46 Get reader identifier

Now the reader has been connected to PC successfully.

## 2.2 Setting RF Parameter

After connecting the reader with PC, we need to set some basic RF parameters: RF Output Power & RF Spectrum. Please select **RF Setup** as illustrated below:



### 2.2.1 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 0 - 26dBm. When this setting completes, it will be saved in the reader automatically even if the power is cut off. The default output power is 26dBm.

### 2.2.2 Setting RF Spectrum

Set the RF spectrum manually.

- Please defer to Frequency parameter tablet in Communication protocol for more information about the carrier frequency.
- Frequency range the reader supports: 865MHz-868MHz(ETSI), 902MHz -928MHz(FCC).

You can set the reader in **RF Spectrum Setup->User Define**, as illustrate below:

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



## 2.3 ISO-18000-6C tag inventory

Connect the Reader correctly. Tag operation could be started when RF Setup is completed.

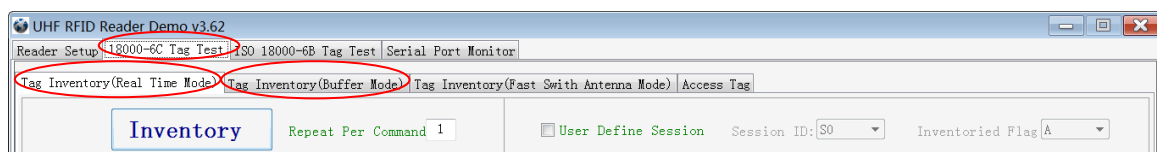
**Tag inventory** means reader identifying multiple tags'EPC number at the same time. This is the core function of UHF RFID Reader and one of the standards to judge a reader's performance.

### 2.3.1 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.

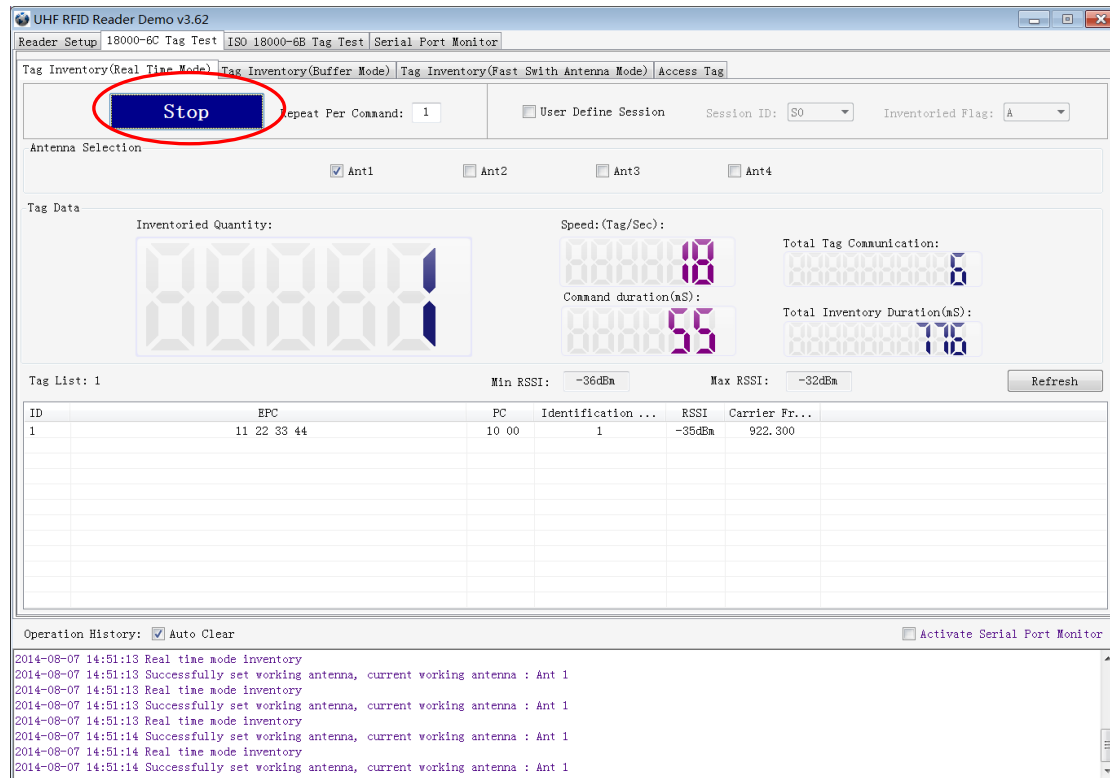
The other is **Buffer Mode**, the data will be cached and uploaded together when you need them. Under this mode, the data are without repeat data and can keep in small volume, because the data will be filtered before being uploaded. But it will take some time to filter duplicate data when reader identifies a large number of tags. Therefore, its identification efficiency will be slightly lower than real-time mode. Note: Tags can't be operated when you extract data in the cache.

Users can choose the appropriate method based on actual situation as illustrated below:



#### Method NO.1: Real-time Mode

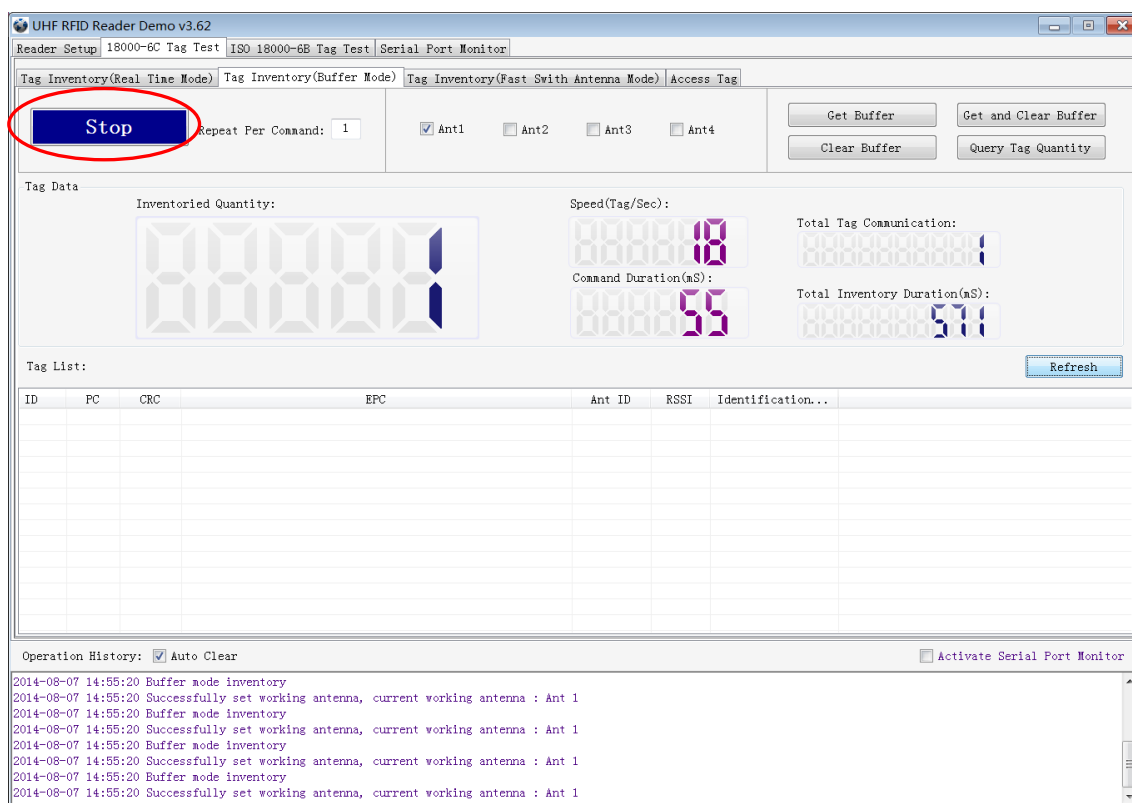
1. Click **Tag Inventory (Real Time Mode)**. Select the connected antenna(s) port. Set the number of **Repeat Per Command**, which is the times of repeat inventory command. For example, inventory command will execute anti-collision algorithm one time when you set the value to 1. It will execute anti-collision 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 <b>Inventory</b> . |
| 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 <b>Inventory</b> , 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.   |

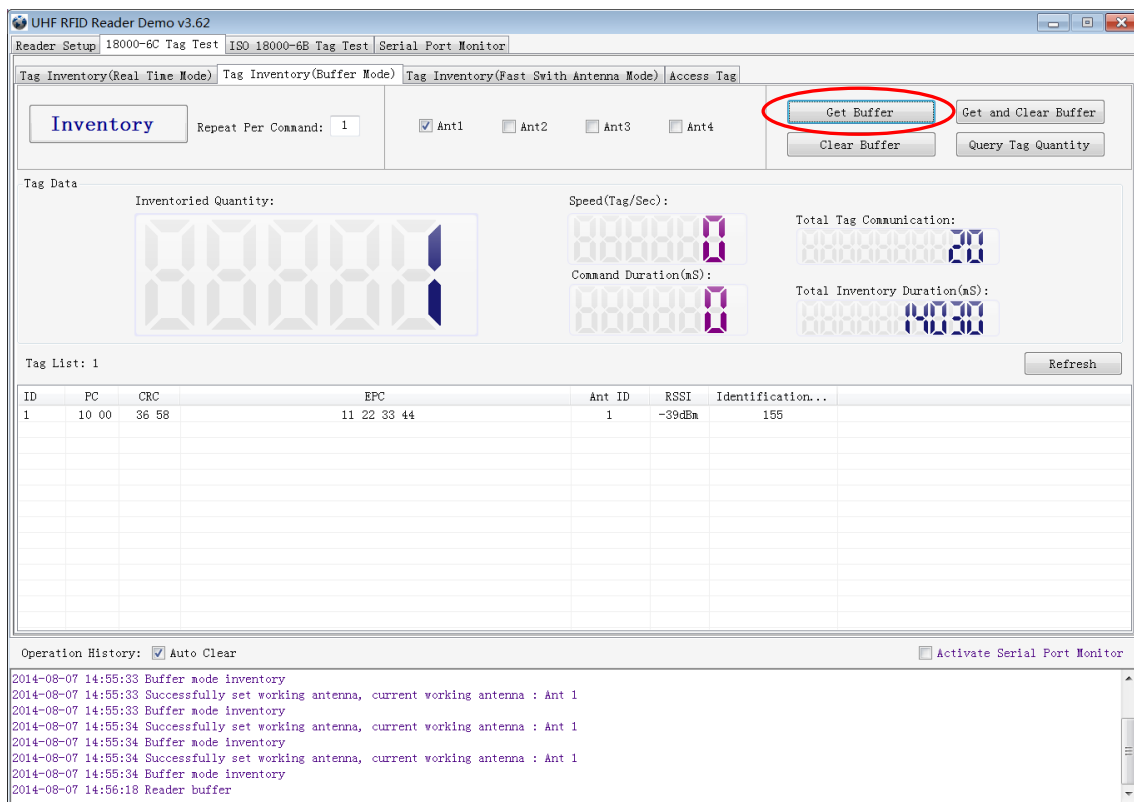
## Method NO.2: Buffer Mode

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



Note: the identified tags won't 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:



Functions description under Buffer Mode:

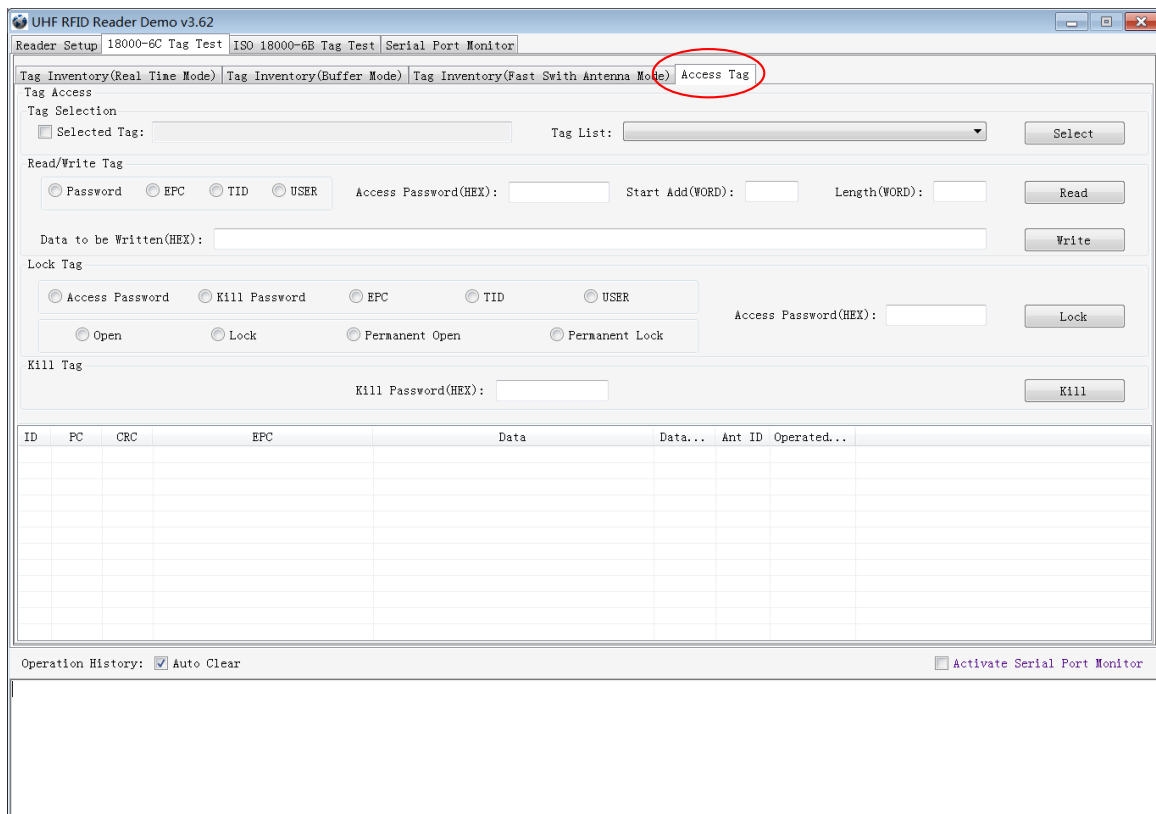
**Get and Clear:** Read the data form cache and then clear the cache. It will be empty when you read the cache again.

**Query tag Quantity:** If you just want to know how many tags are there in cache without details, click on this button.

**Clear Buffer:** Clear the cache and refresh the screen.

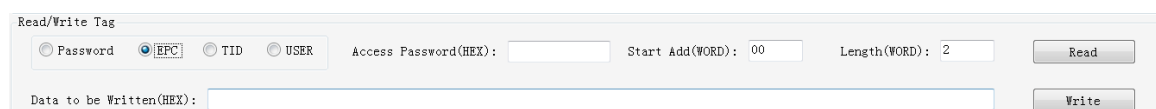
## 2.4 Accessing ISO-18000-6C Tag

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



### 2.4.1 Read tags

You can set the parameter(zones to be read, Start Address and Data Length) as illustrated 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.

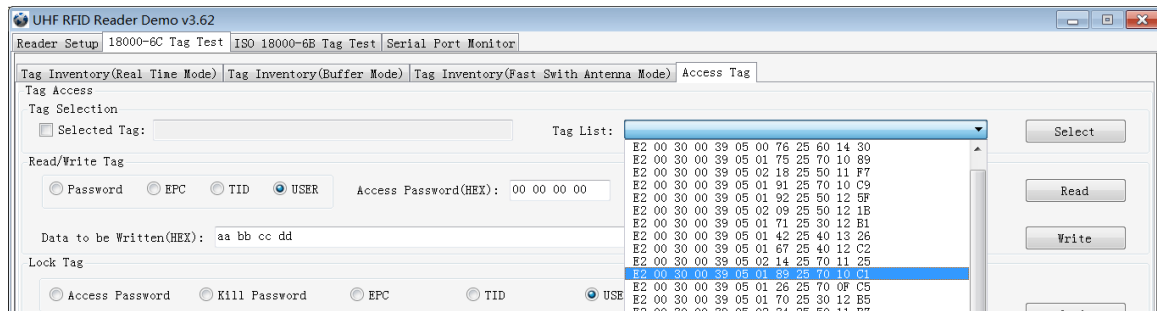
Picture as below shows that one tag has been identified successfully.



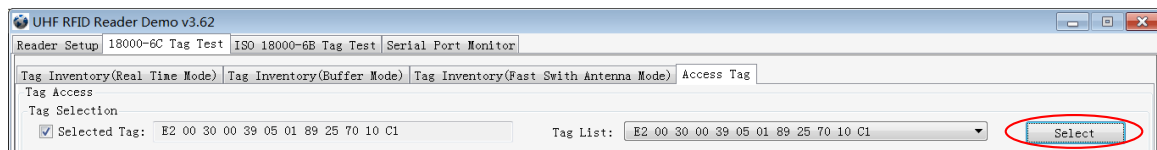


2. Get tags in cache.

3. Access tags and choose the EPC NO. which is needed, as illustrated below:

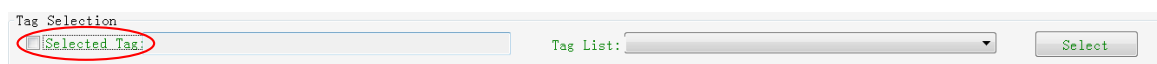


After choosing the tag, please click **Select** and the screen will display as follows:



We could see that the column on the left for **Selected Tag** has been selected. Next, all the operations are based on the tag with this EPC NO.

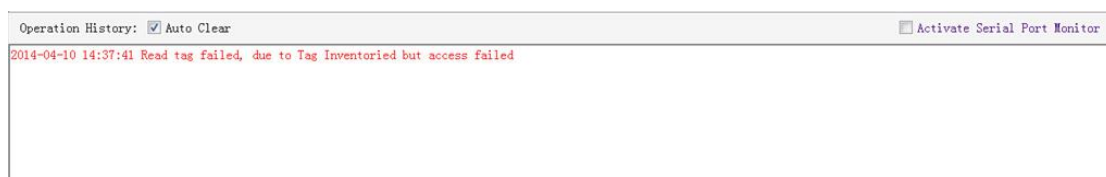
If you want to cancel the match of EPC, just deselect the column for **Selected Tag**, as below:



## 2.4.6 Error Display Might Be Returned

Errors occur if wrong operations done:

### ◆ Inventory success, access failure:



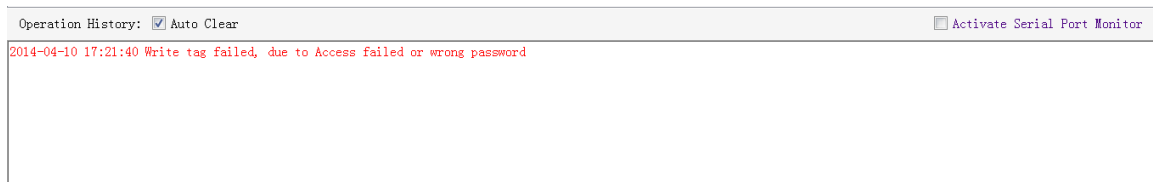
There are two steps to get access to tags: firstly, tag inventory; secondly, access tags. Picture above shows the inventory is successful, failed to access to tags.



Two reasons why:

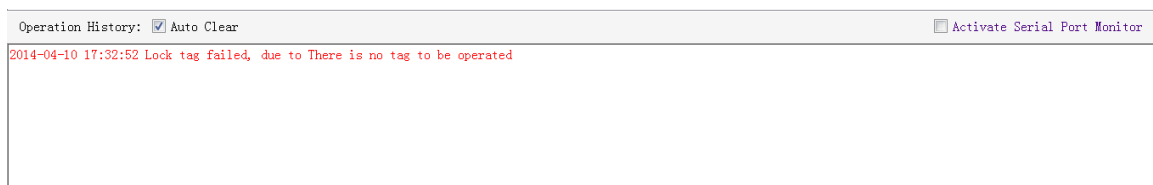
1. Parameters incorrect: for example, zones(password/ EPC/ TID/ User) to be read do not exist.
2. Tags beyond the area that the RF could cover: distance of accessing to tags is about 60%-70% of tag inventory; in this case, please put the tag closer to the antenna.

◆ **Wrong password:**



Reason why: wrong password is set.

◆ **No tags to be operated:**



Reason why: Tags beyond the area that the RF could cover.

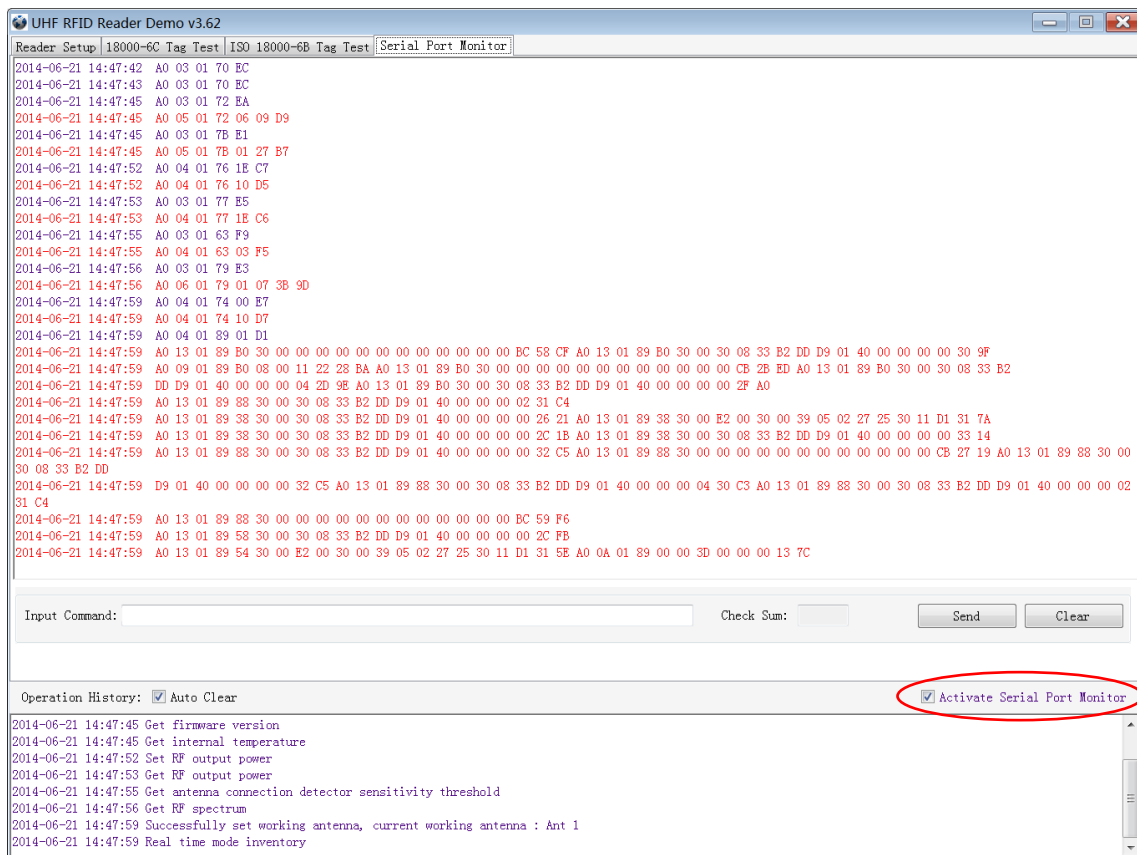
For more information about the operation history returned, please defer to the document: **UHF RFID Reader Serial Interface Protocol V3.1**.

### 3. Develop your own RFID Application

Most functions of the reader can be operated through the demo. But in practical applications, user might need to develop their own applications. Please defer to the document: **UHF RFID Reader Serial**

**Interface Protocol V3.1.** The reader follows the definition both of the RS - 232 and TCP / IP interface.

Demo provides an important function of recording serial transmission, so that users can quickly grasp the content of communication protocol in practice. Please refer to the screenshot below and select **Activate Serial Port Monitor**, all uplink and downlink serial data will be recorded, as illustrated below:

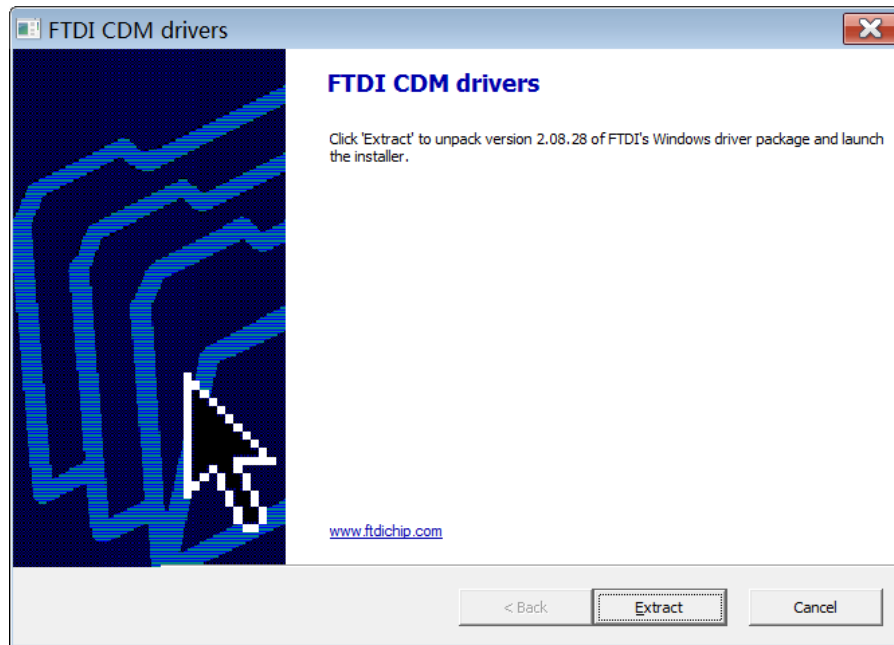


#### Notes:

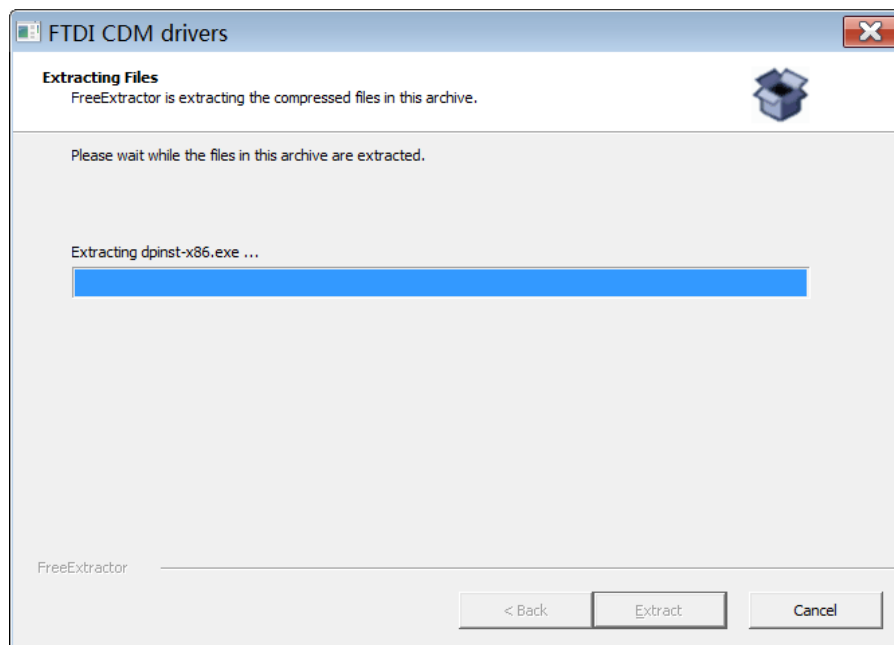
1. Response speed of Demo will slow down after opening the **Activate Serial Port Monitor**. Please turn off this function when it is not needed.
2. Data in violet blue color is sent to the reader by PC, and data in red color is the returned information from reader to PC.
3. Manual **Input Command** is used to debug serial command, which could calculate the checksum automatically.
4. **UHF RFID Reader Serial Interface Protocol V3.1**, this document includes the integral source codes of the demo (Based on C # of .Net platform) to help users develop applications on the reader. Thank you!

## 4. 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, we could connect reader to PC successfully.