ClarIDy UHF USB Reader Demo Program User's Manual for Win32

Model No.: UEE005

Version: A.2-02

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ClarIDy Solutions, Inc.

ClarIDy UHF USB Reader Demo Program

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ClarIDy UHF USB Reader Demo Program

Change Log

Revision	Date	Author	Description
A.1	2008.09.02.	Hoe Huang	Create the ClarIDy UHF Demo Program User's Manual.
A.2	2008.11.07	Hoe Huang	Modified Demo Program User's Manual, and added examples.
A.2-01	2008.12.09	Jun-Rong Chang	Added the application of Lock Tag and Kill Tag
A.2-02	2009.01.05	Jun-Rong Chang	Added the application of enable password function and write password.

Table of Contents

1. Introduction

This document describes the demo program (ClarIDy_UHF_Demo_Setup.exe) for ClarIDy UHF RFID Reader. The demo program provides "Setting", "Algorithm", "Inventory", "Read/Write", "Filter Inventory", "Filter Read/Write" and "Lock/Kill" functions. Users can use this application to control the ClarIDy UHF RFID Reader to communicate with EPC RFID tags. The operational procedures are described as the following chapters.

2. Installation

Before Installing the USB Driver and ClarIDy UHF Demo program, please see prerequisites first.

2.1 Prerequisites to Installation

In order to run ClarIDy UHF Demo program as smoothly as possible, we recommend some conditions as following.

2.1.1 Hardware Platform Requirements

The following hardware Platforms are supported by ClarIDy UHF RFID Reader.

- CPU: Intel® Pentium® 4 or AMD Athlon™ processor, 1.4 GHz or above
- RAM: 512MB or above

2.1.2 Operating System Requirements

The following host operating systems are supported by ClarIDy UHF RFID Reader:

- Microsoft®, Windows Vista®, Windows XP® with Service Pack 2 or Service Pack 3 on an IA-32 platform; USB Host Controller – OHCI, UHCI or EHCI

2.1.3 Other Software Requirements

The following other systems are supported by ClarIDy UHF RFID Reader:

- Microsoft® .Net Framework® Release 2.0
- Microsoft® Visual C++ Libraries 2008

2.2 Setup the USB Driver

First time using the ClarIDy's UHF RFID Reader (USB Interface), you must install the driver. (The Driver programs are located in the "drivers" folder of the disc.)

Please directly connect the ClarIDy UHF RFID Reader to the USB port of the computer. The Windows system will detect the ClarIDy UHF RFID Reader as a new device and popup the device driver setup dialog, as figure 1.

Install ClarIDy UHF RFID driver step by step as the following instructions:

1. Select "Install from a list or specific location (Advanced)", as figure 2.
2. Click "Next" while the wizard searches, as figure 3.
3. System show out figure 4.
4. Select "No, do not connect to the internet now", as figure 5.

5. Click "Next" while the installation option dialog is shown, as figure 6.

6. When "Hardware Installation" dialog is shown, please click "Continue Anyway" to continue the installation, as figure 8 and figure 9.

7. Click "Finish" to finalize the installation of the RFID USB device driver, as figure 10.

Figure 1
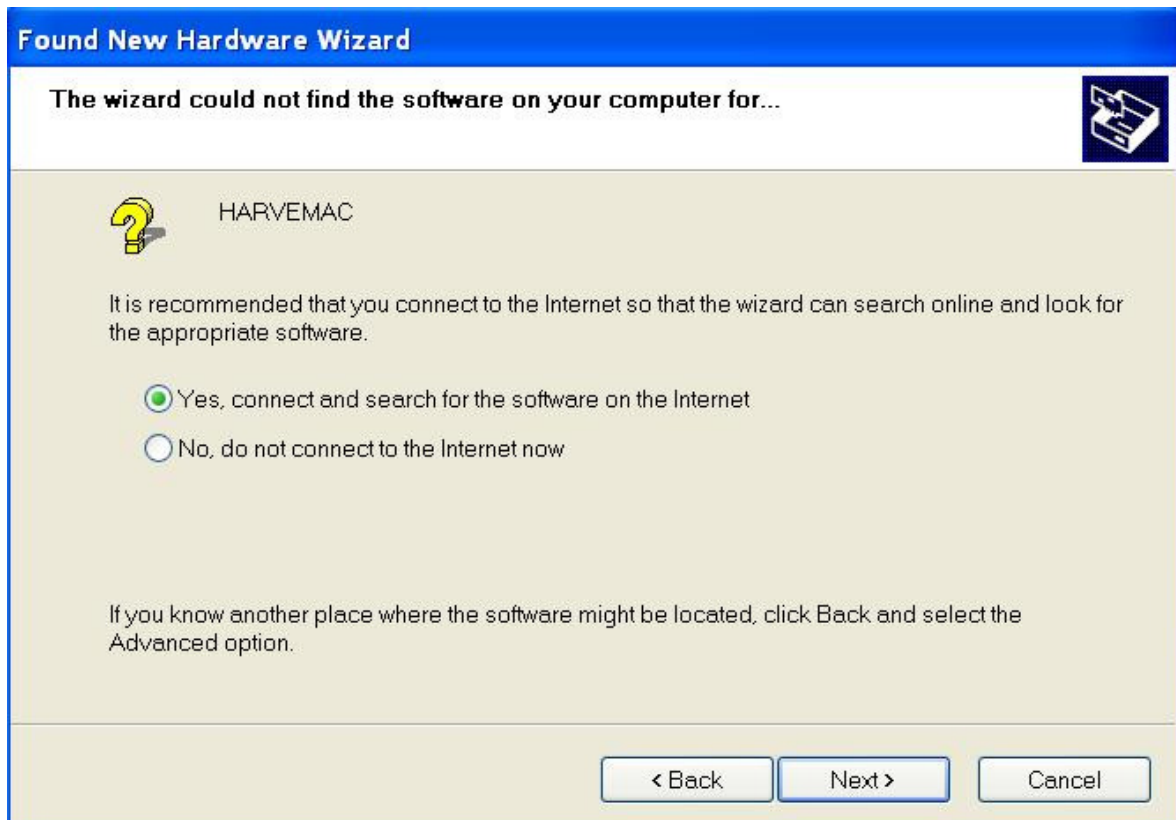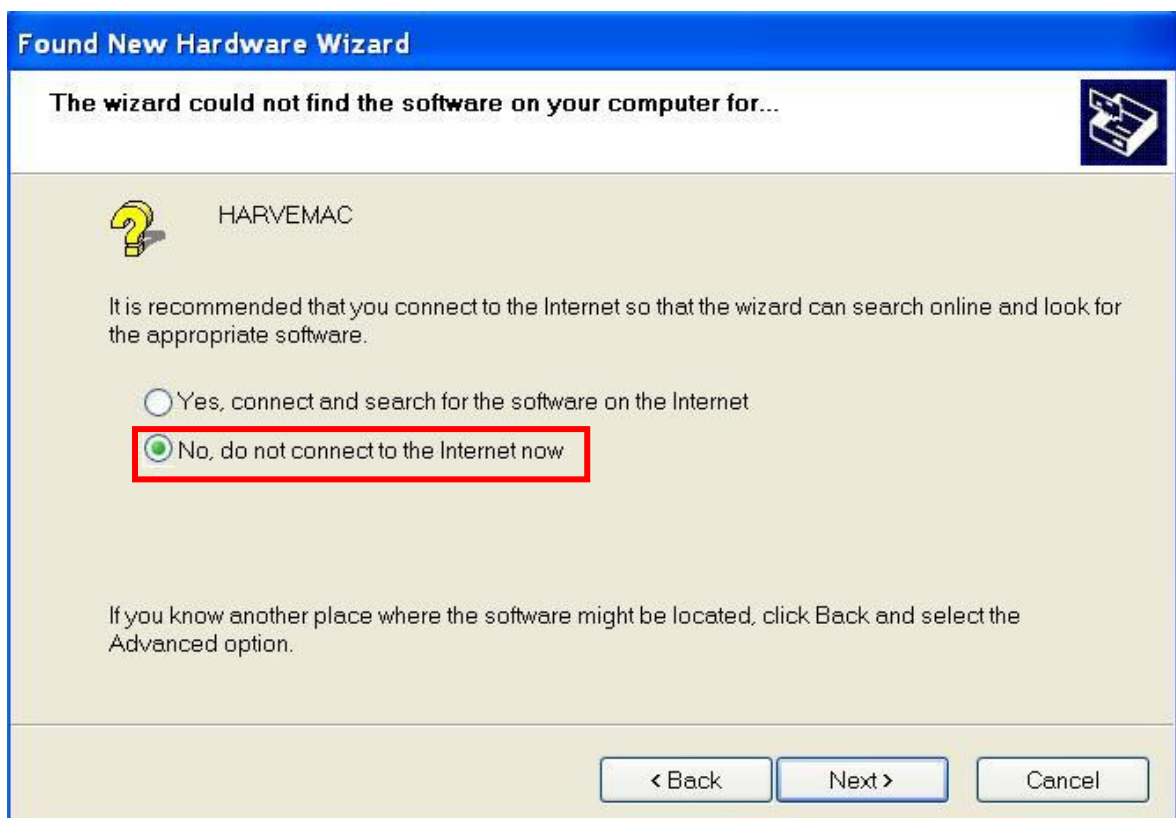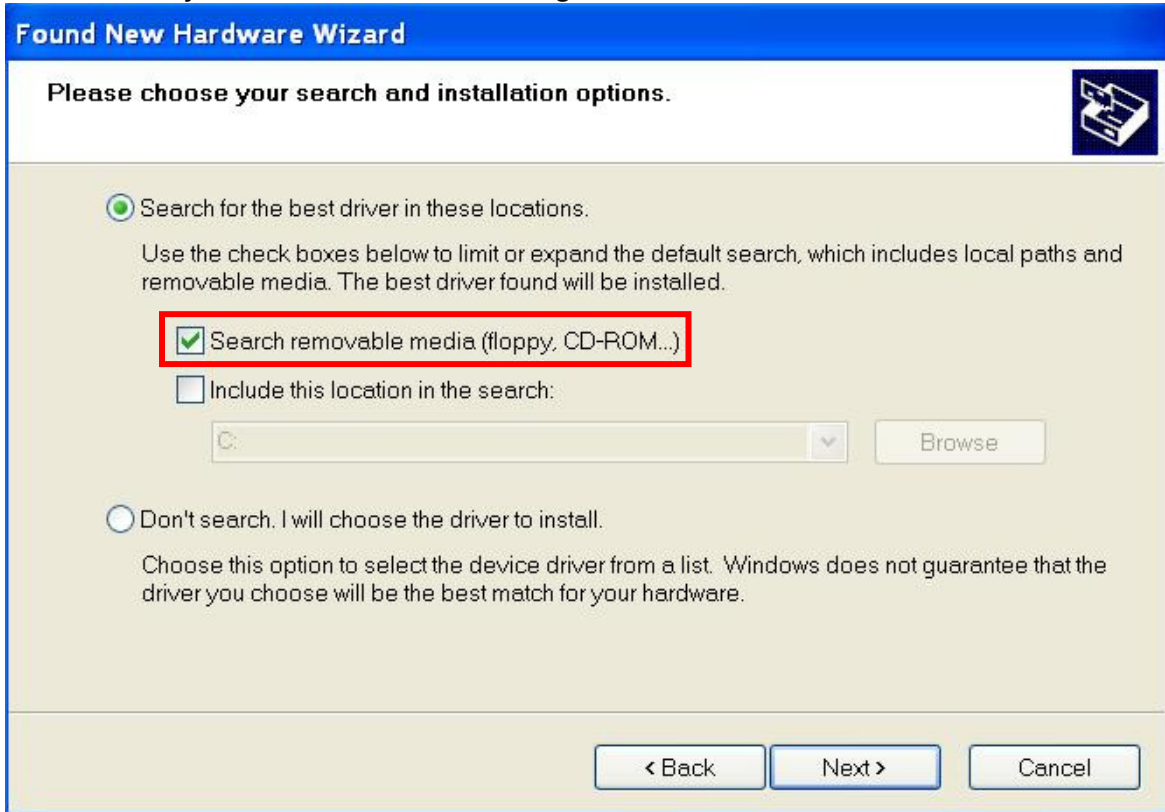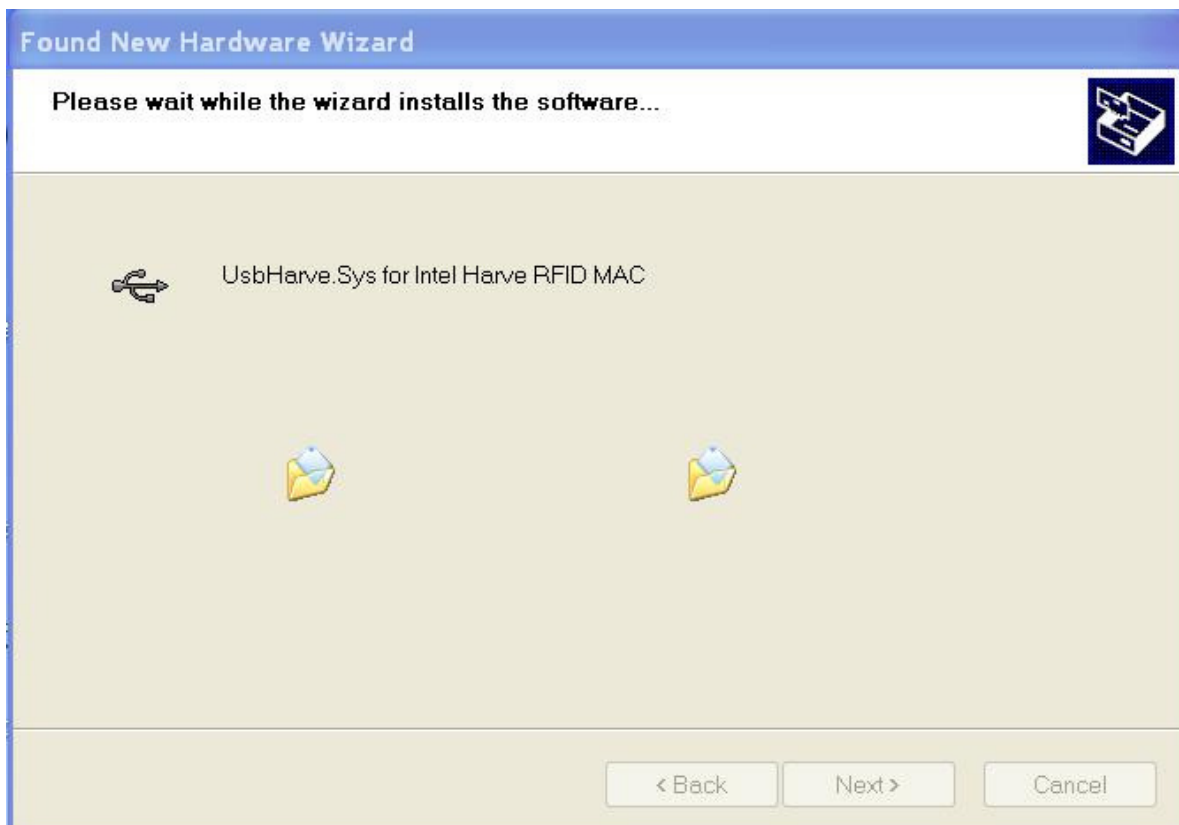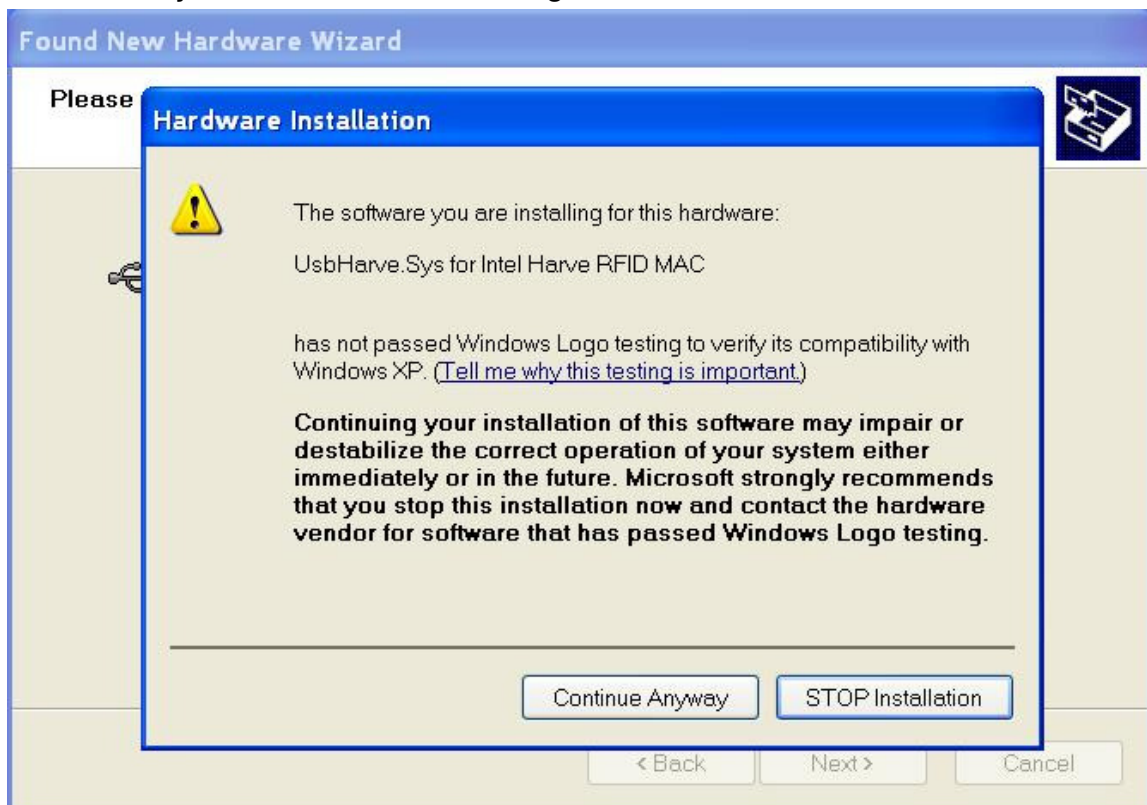
Figure 2

Figure 3

Figure 4

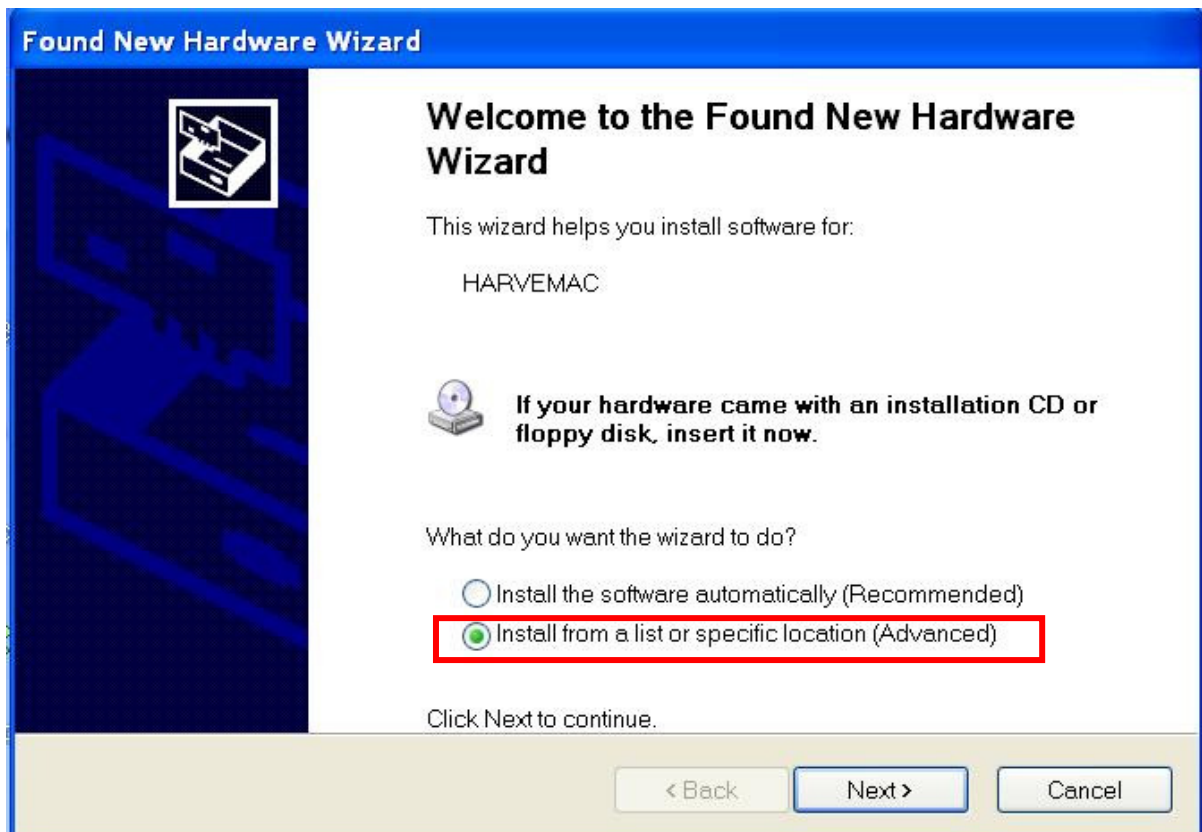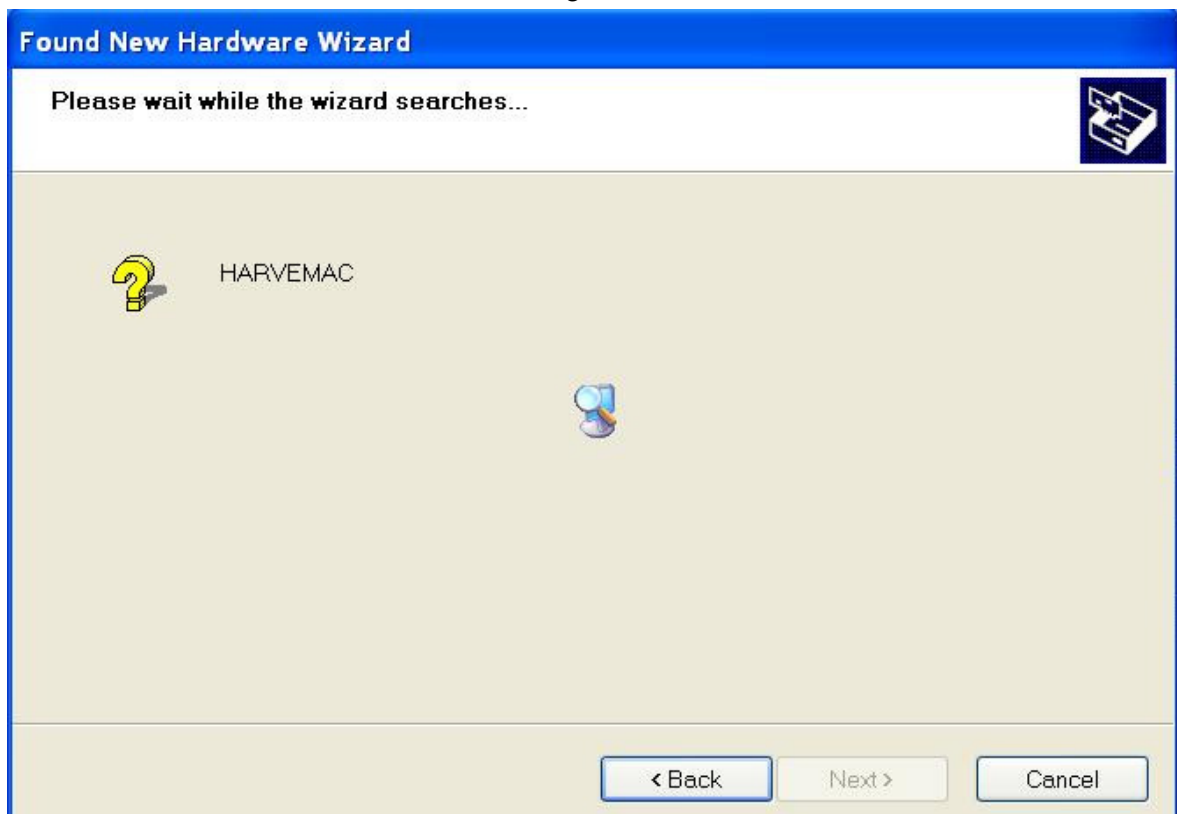
Figure 5

Figure 6

Figure 7
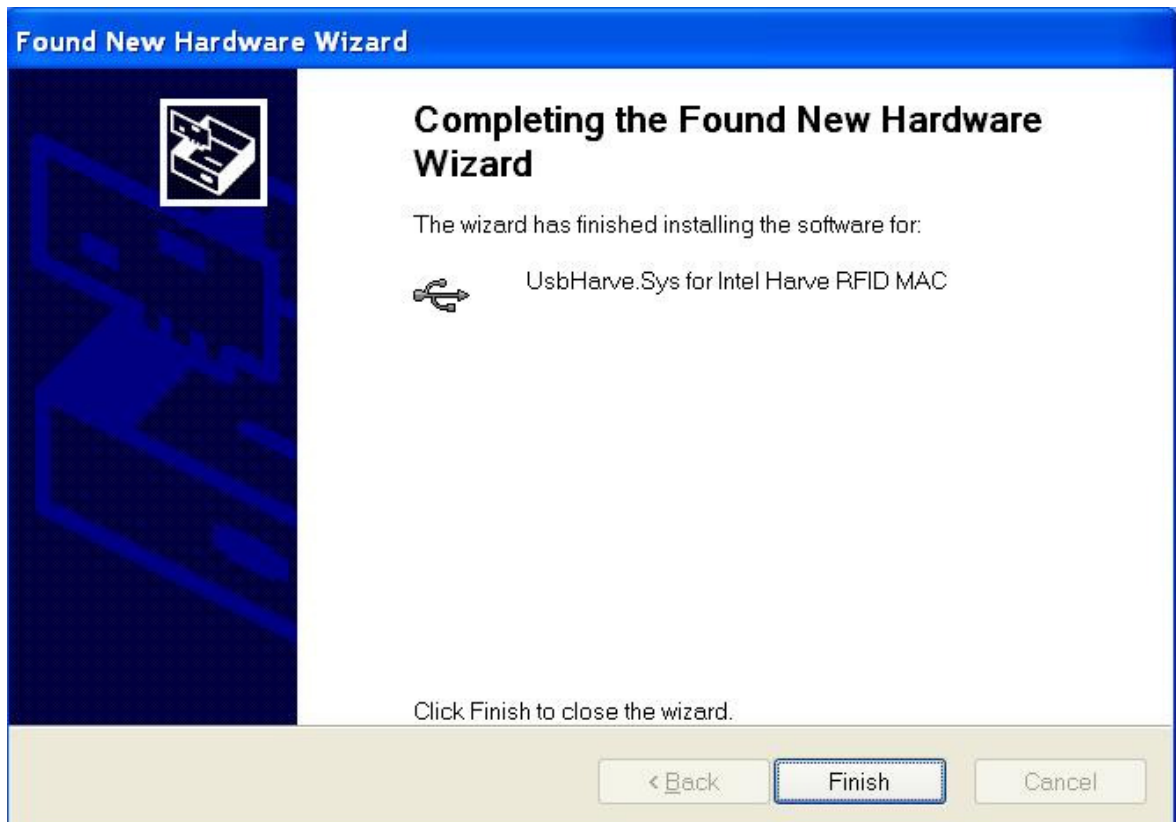
Figure 8

Figure 9

Figure 10

2.3 Install .Net Framework 2.0

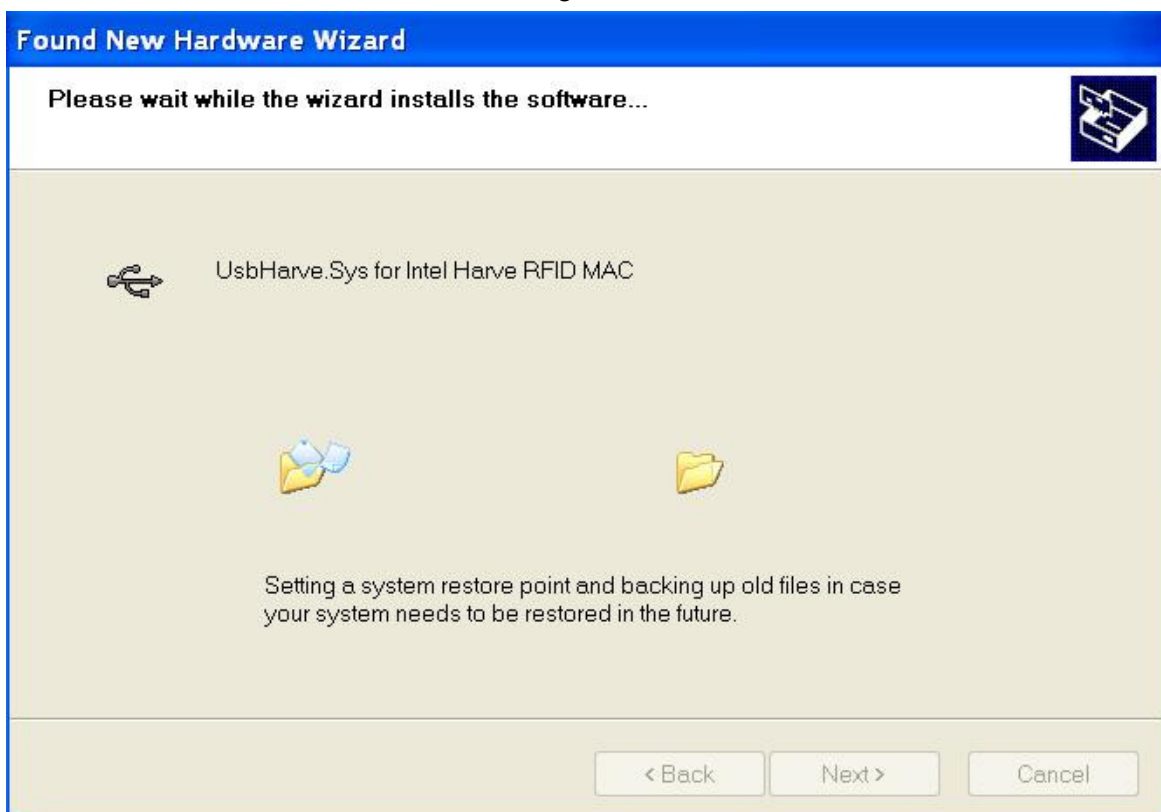If your O/S doesn't have installed .Net Framework 2.0 yet, "Setup.exe" would install .Net Framework 2.0 automatically. And install .Net Framework 2.0 step by step as the following instructions:

1. Double click "Setup.exe" (The file is located in the win32 folder of the disc.)
2. Select Read and accept the terms of the license agreement, and click "Install", as figure 11.
3. Wait the installation, as figure 12.
4. Click "Exit" to finish the installation, as figure 13.
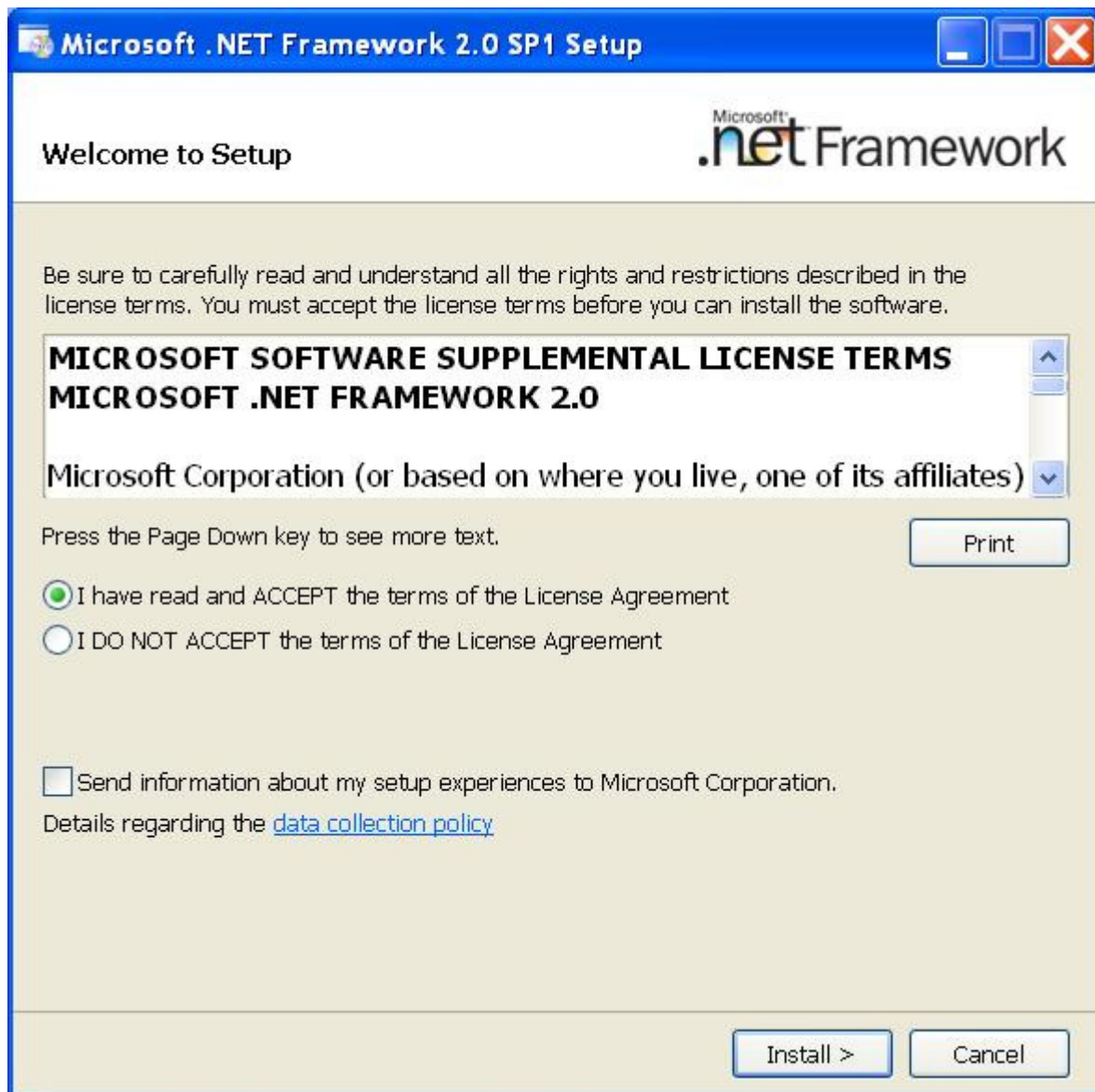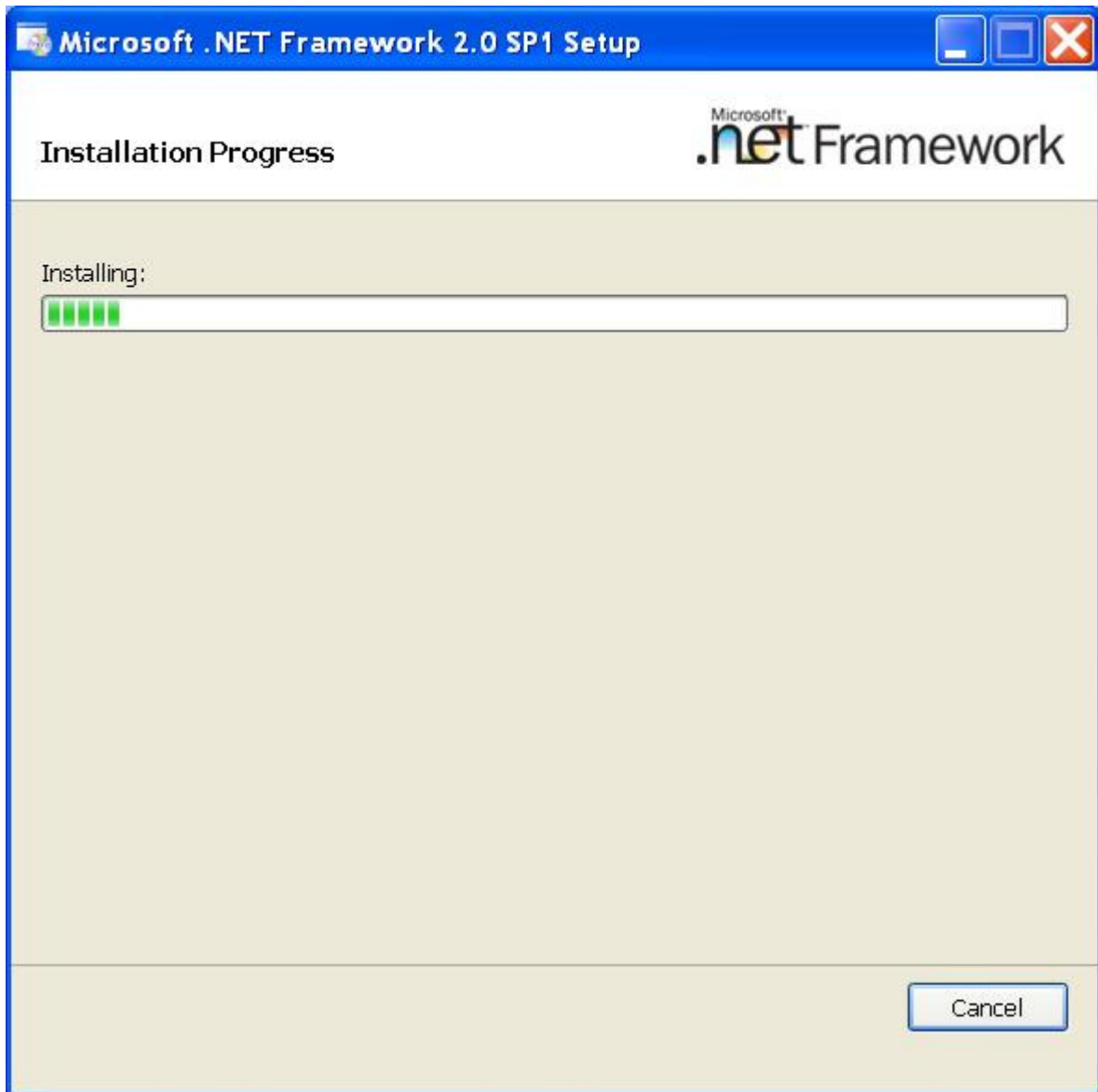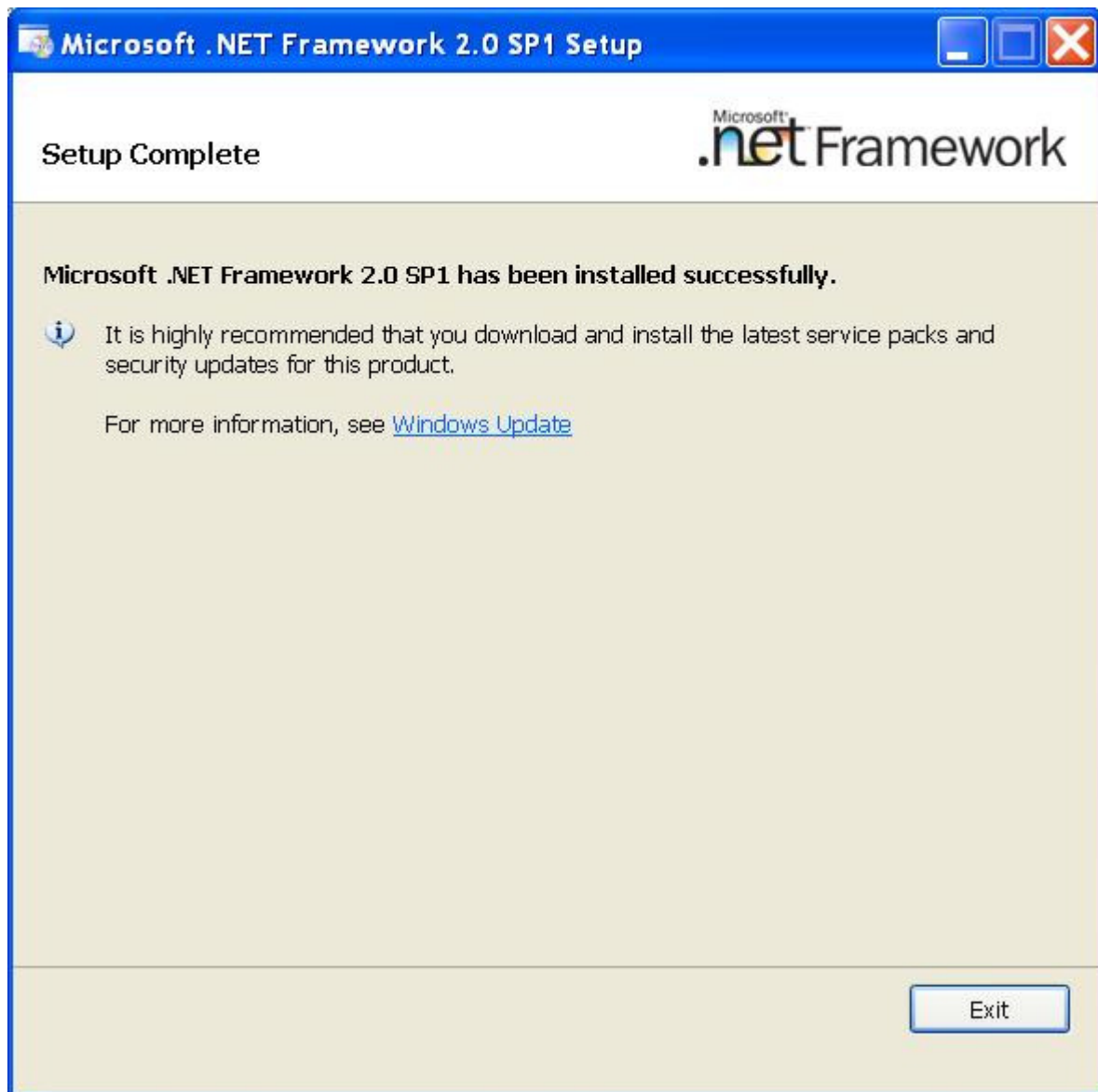
Figure 11

Figure 12

Figure 13

2.3 Install ClarIDy UHF Demo

Install ClarIDy UHF Demo step by step as the following instructions:

1. Double click "Setup.exe" which is in the disc (The file is located in the win32 folder of the disc.).
2. Click "Next", as figure 14.
3. Click "Browser" to the Folder to install and select the user, and click "Next", as figure 15.
4. Click "Next" to start installation, as figure 16.
5. Wait for the installation, as figure 17.
6. Click "Close" to exit, as figure 18.
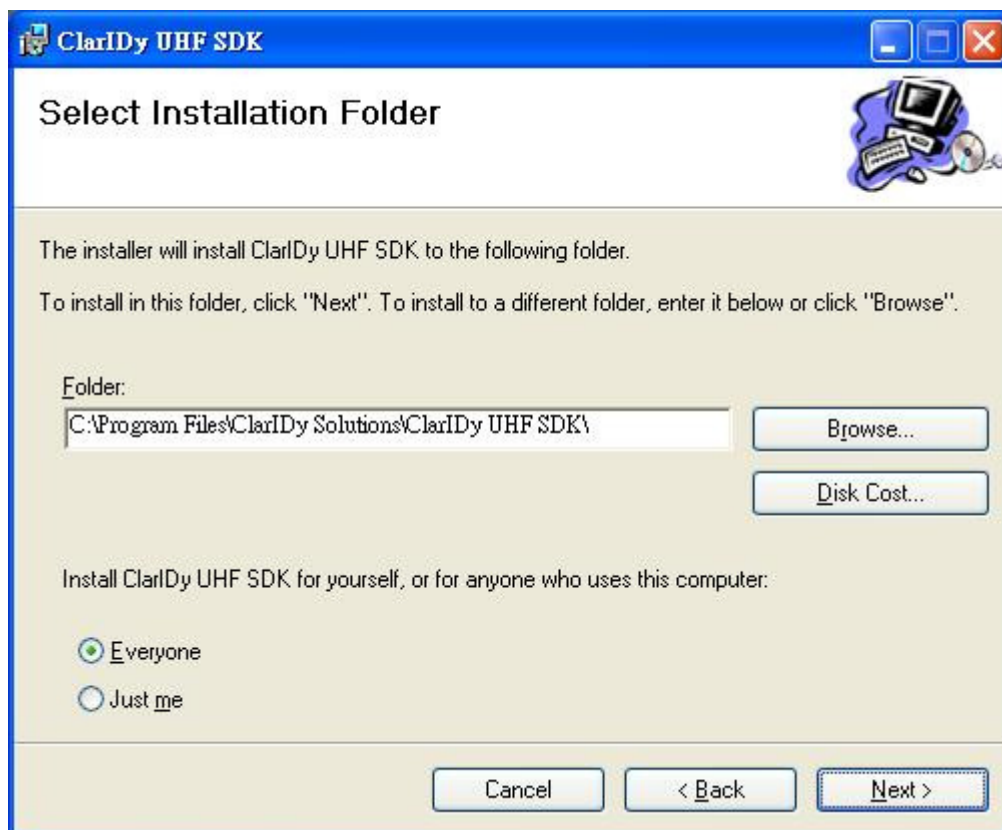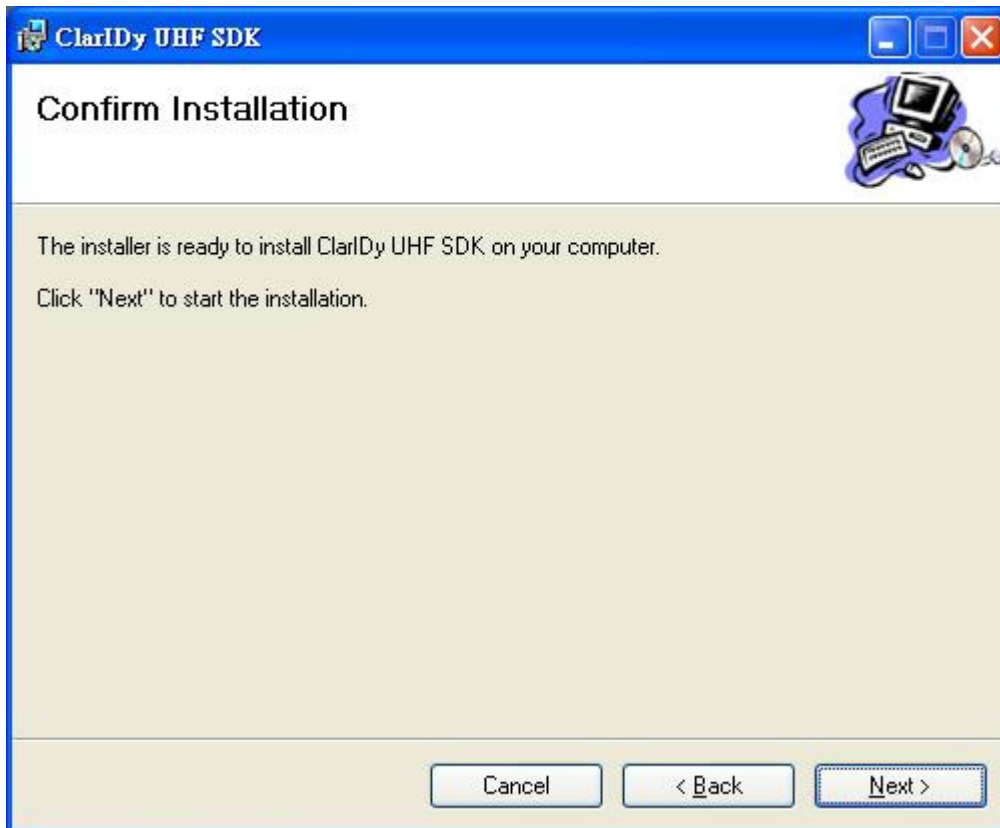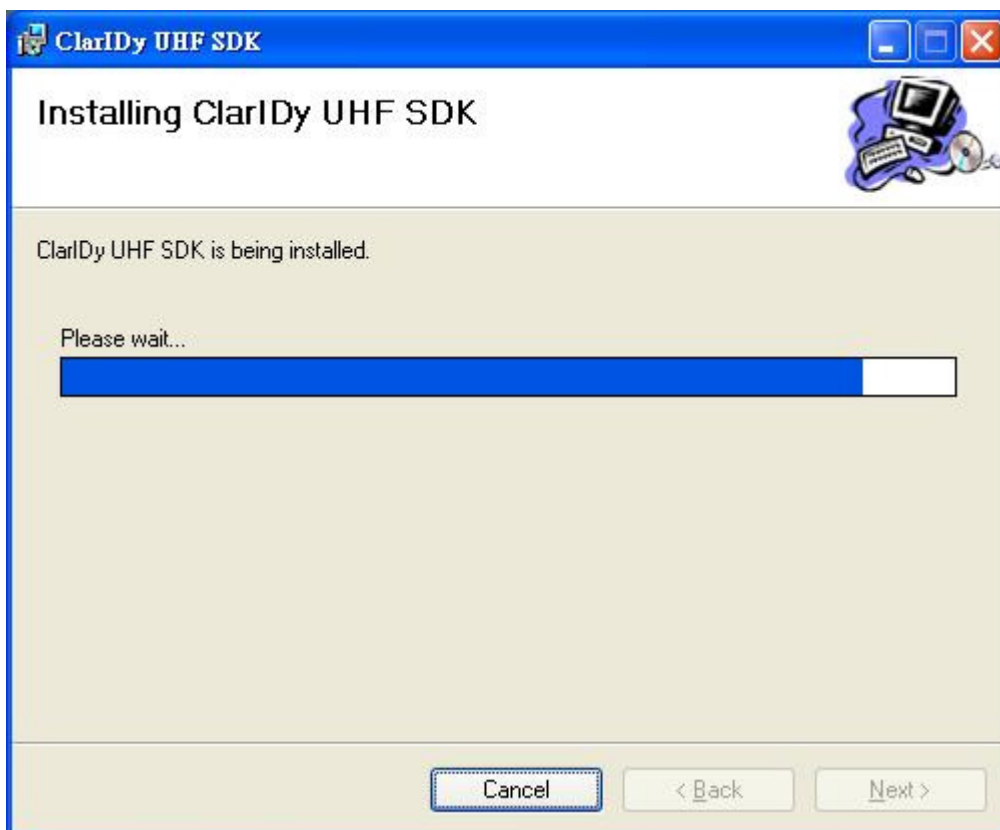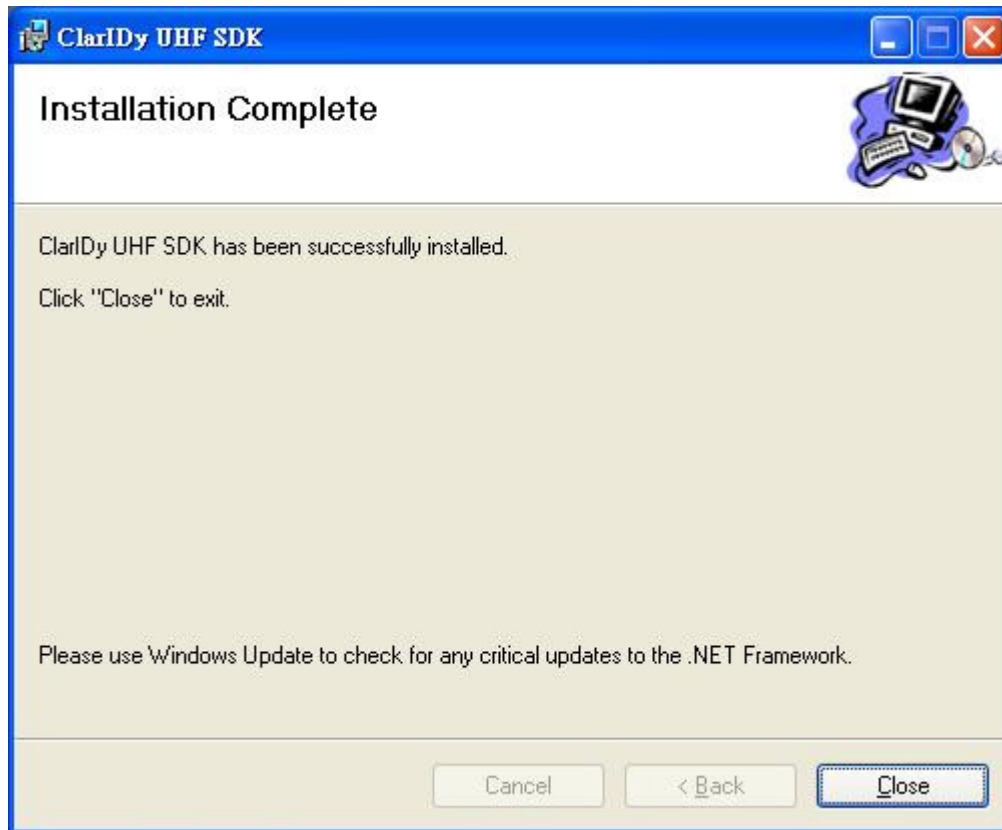
Figure 14

Figure 15

Figure 16

Figure 17

Figure 18

3. Demo Program Operation Guide

The following sections will describe the usage of the ClarIDy UHF Demo application. The application is include seven Controls, "Setting Control", "Algorithm Control", "Set-Session Control", "Inventory Control", "Read/Write Control", "Filter Inventory Control", "Filter Read/Write Control" and "Lock/Kill Control".

3.1 Setting Control

Click the "Setting" button of the main form, as figure 19. The Settings Page is displayed. This page allows the user to configure the following items:

- Link Profile
- Data Format (Compact, Normal or Extended)
- Operational Mode (Continuous Mode or Discontinuous Mode)
- Inventory Algorithm (Fixed "Q", Variable "Q", Variable "Q" Adjustable or Variable "Q" Threshold)
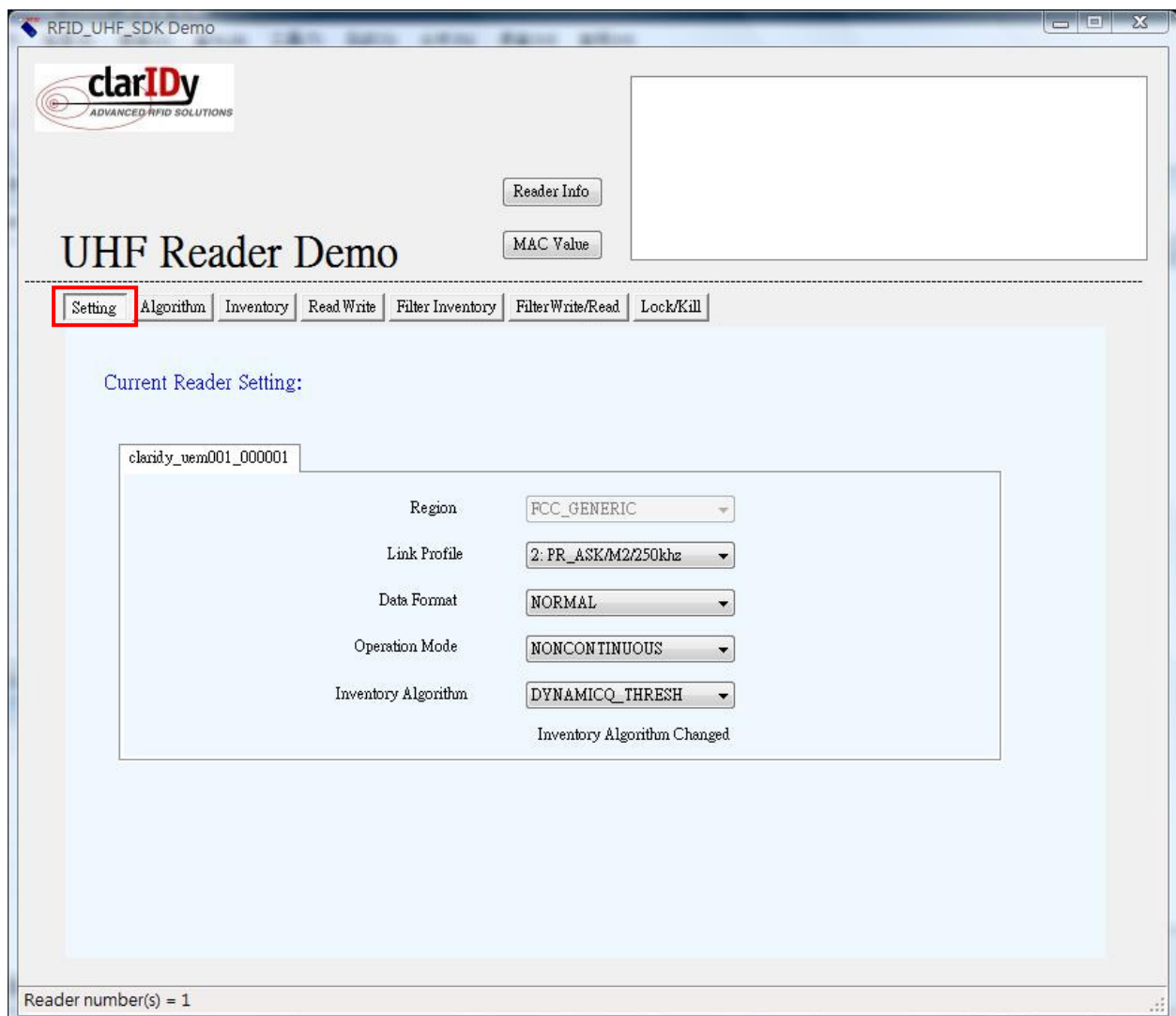
Figure 19: Setting View Panel

As you can see in Figure 20, the settings page has a two column layout. The left column is used to specify the startup settings that will be automatically applied to the reader when the application starts. The right column allows the user to change the current reader configuration.
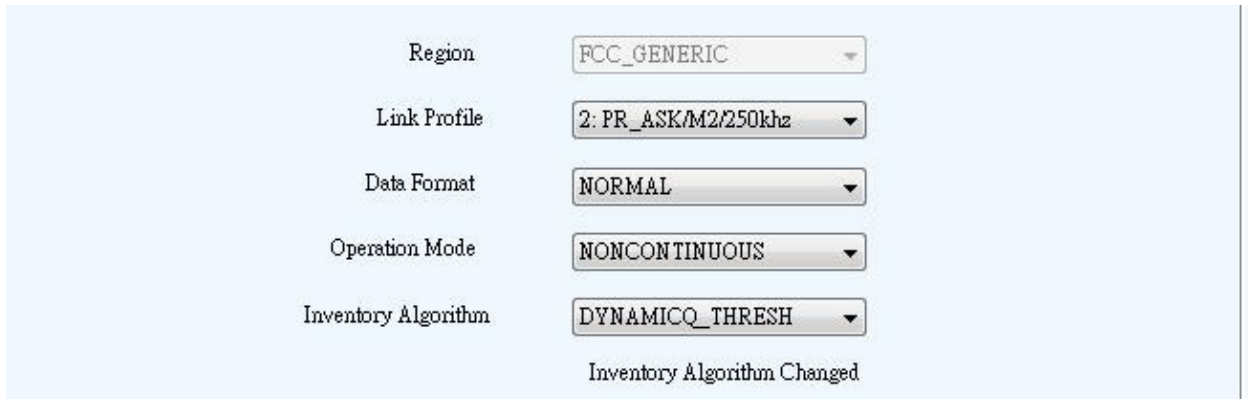
Figure 20: Settings

1. Link Profile: Sets the current link profile for the reader module, as figure 21. The option is as follows:

        0: DSB ASK / MO / 40 khz

        1: DSB_ASK / M1 / 160 khz

        2: PR_ASK / M2 / 25U khz

        3: PR_ASK / M2 / 300 khz

        4: DSB_ASK / MO / 400 khz

        5: PR_ASK / M1 / 250 khz
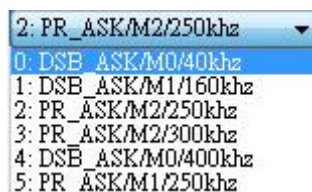
Figure 21

2. Data Format: Sets the operation response data reporting mode for tag-protocol operations, as figure 22. The option is as follows:

    COMPACT: The response data is limited to provide the application with the pertinent tag-access operation data, but minimize the amount of MAC-to-host communication overhead.

    NORMAL: The response data builds on the compact mode to provide the application with status and contextual information to give additional finer-grained feedback such as the beginning of inventory cycles, etc.

    EXTENDED: The response data builds on the normal mode by providing additional

diagnostics and statistical information.

Figure 22

3. Operation Mode: Sets the reader's operation mode, as figure 23. The option is as follows:

  CONTINUOUS: In continuous mode, when a tag-protocol-operation cycle (i.e., one iteration through all enabled antenna ports) has completed, the reader module will begin a new tag-protocol-operation cycle with the first enabled antenna port and will continue to do so until the operation is explicitly cancelled by the application.

  NONCONTINUOUS: In non-continuous mode, only a single tag-protocol-operation cycle is executed upon the reader module.

Figure 23

4. Inventory Algorithm: Allows the application to set the currently-active singulation algorithm, as figure 24. The option is as follows:

  0: ALGORITHM_FIXEDQ

  1: DYNAMICQ

  2: DYNAMICQ_ADJUST

  3: DYNAMICQ_THRESHOLD
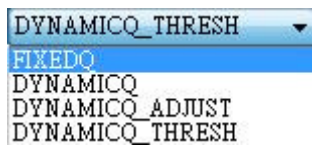
Figure 24

3.2 Algorithm Control

Click the "Algorithm" button of the main form, as figure 25. The Algorithm pane is used to view, the parameters for the selected singulation algorithm. The user may select Fixed Q, Dyanmic Q, Dynamic Q Adjustable and Dynamic Q Threshold from the Active Algorithm combo box and click "Load" button to query the current selected Algorithm and refresh the values displayed in the Algorithm Settings View panel, as figure 26.
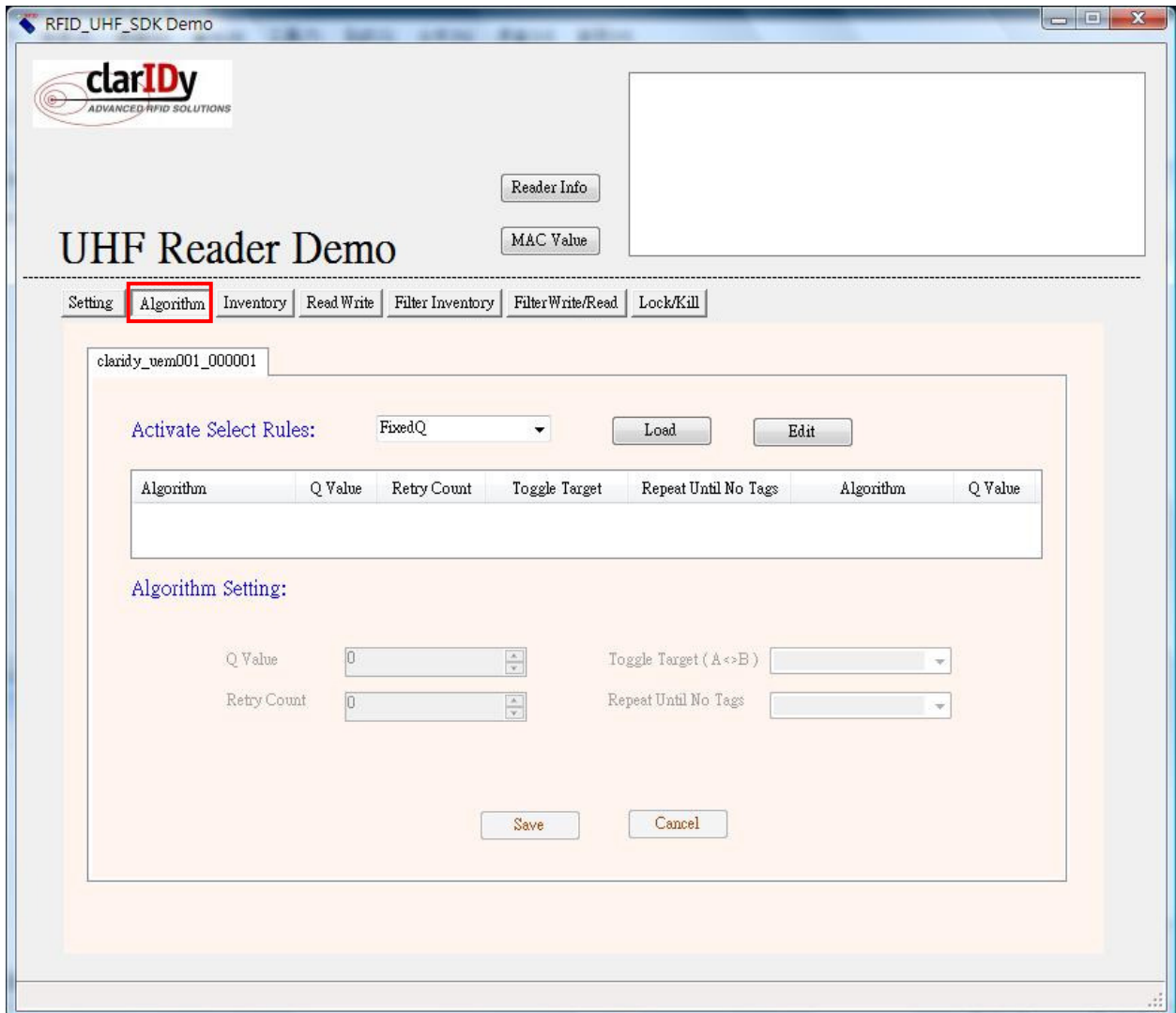
Figure 25: Algorithm View Panel

Figure 26: Load Value

To modify the algorithm settings for the current reader, click on the "Edit" button. This will enable a algorithm setting panel similar to the one shown in Figure 27.

Figure 27: Modify Algorithm Settings

1. FixedQ : Fixed Q algorithm. The items as follows:

1: qValue: The Q value to use. Valid values are 0 to 15, inclusive.

2: retryCount: Specifies the number of times to try another execution of the singulation algorithm for the specified session/target before either   toggling the target (if toggleTarget is non-zero) or terminating the inventory/tag access operation.   Valid values are 0-255, inclusive.

3: toggleTarget: A flag that indicates if, after performing the inventory cycle for the specified target (i.e., A or B), if the target should be toggled (i.e., A to B or B to A) and another inventory cycle run.   A non-zero value indicates that the target should be toggled.   A zero value indicates that the target should not be toggled.   Note that if the target is toggled, retryCount and repeatUntilNoTags will also apply to the new target.

4: repeatUntilNoTags: A flag that indicates whether or not the singulation algorithm should continue performing inventory rounds until no tags are singulated. A non-zero value indicates that, for each execution of the singulation algorithm, inventory rounds should be performed until no tags are singulated. A zero value indicates that a single inventory round should be performed for each execution of the singulation algorithm.

2. DynamicQ: Adjusts the Q value based on the presence or absence of tags. The items as follows:

1: startQValue: The starting Q value to use.   Valid values are 0 to 15, inclusive. minQValue <=   startQValue <= maxQValue

2: minQValue: The minimum Q value to use.   Valid values are 0 to 15, inclusive. minQValue <= startQValue <= maxQValue

3: maxQValue: The maximum Q value to use.   Valid values are 0 to 15, inclusive. minQValue <= startQValue <= maxQValue

4: retryCount: Specifies the number of times to try another execution of the singulation algorithm for the specified session/target before either toggling the target (if toggleTarget is non-zero) or terminating the   inventory/tag access operation. Valid values are 0-255, inclusive.

5: maxQueryRepCount: The maximum number of ISO 18000-6C QueryRep commands that will follow the ISO 18000-6C Query command during a single inventory round.   Valid values are 0-255, inclusive.

6: toggleTarget: A flag that indicates if, after performing the inventory cycle for the specified target (i.e., A or B), if the target should be toggled (i.e., A to B or B to A) and another inventory cycle run.   A non-zero value indicates that the target should be toggled.   A zero value indicates that the target should not be toggled.   Note that if the target is toggled, retryCount and repeatUntilNoTags

will also apply to the new target.

3. DynamicQAdjust: This algorithm modifies the previous dynamic Q algorithm by issuing ISO 18000-6C Query Adjust commands instead of ISO 18000-6C Query commands when adjusting the Q value. The items as follows:

1: startQValue: The starting Q value to use.   Valid values are 0 to 15, inclusive.

minQValue <=   startQValue <= maxQValue

2: minQValue: The minimum Q value to use.   Valid values are 0 to 15, inclusive.

minQValue <= startQValue <= maxQValue

3: maxQValue: The maximum Q value to use.   Valid values are 0 to 15, inclusive.

minQValue <= startQValue <= maxQValue

4: retryCount: Specifies the number of times to try another execution of the singulation algorithm for the specified session/target before either toggling the target (if toggleTarget is non-zero) or terminating the   inventory/tag access operation. Valid values are 0-255, inclusive.

5: maxQueryRepCount: The maximum number of ISO 18000-6C QueryRep commands that will follow the ISO 18000-6C Query command during a single inventory round.   Valid values are 0-255, inclusive.

6: toggleTarget: A flag that indicates if, after performing the inventory cycle for the specified target (i.e., A or B), if the target should be toggled (i.e., A to B or B to A) and another inventory cycle run.   A non-zero value indicates that the target should be toggled.   A zero value indicates that the target should not be toggled.   Note that if the target is toggled, retryCount and repeatUntilNoTags will also apply to the new target.

4. DynamicQThreshold: This algorithm uses a Q-modification algorithm that allows the application to control the change of the Q-adjustment-threshold value. The items as follows:

1: startQValue: The starting Q value to use.   Valid values are 0 to 15, inclusive.

minQValue <=   startQValue <= maxQValue

2: minQValue: The minimum Q value to use.   Valid values are 0 to 15, inclusive.

minQValue <= startQValue <= maxQValue

3: maxQValue: The maximum Q value to use.   Valid values are 0 to 15, inclusive.

minQValue <= startQValue <= maxQValue

4:retryCount: Specifies the number of times to try another execution of the singulation algorithm for the specified session/target before either toggling the target (if toggleTarget is non-zero) or terminating the inventory/tag access operation. Valid values are 0-255, inclusive.

5: toggleTarget: A flag that indicates if, after performing the inventory cycle for the specified target (i.e., A or B), if the target should be toggled (i.e., A to B or B to

A) and another inventory cycle run.   A non-zero value indicates that the target should be toggled.   A zero value indicates that the target should not be toggled.   Note that if the target is toggled, retryCount and repeatUntilNoTags will also apply to the new target.

6: thresholdMultiplier: The multiplier, specified in units of fourths (i.e., 0.25), that will be applied to the Q-adjustment threshold as part of the dynamic-Q algorithm. Valid values are 0-255, inclusive.

3.3 Inventory Control

Click the "Inventory" button of the main form, as figure 28. The Inventory panel is used to read tag data and view tag data. Click the "Start" button to read tags, as figure 29.
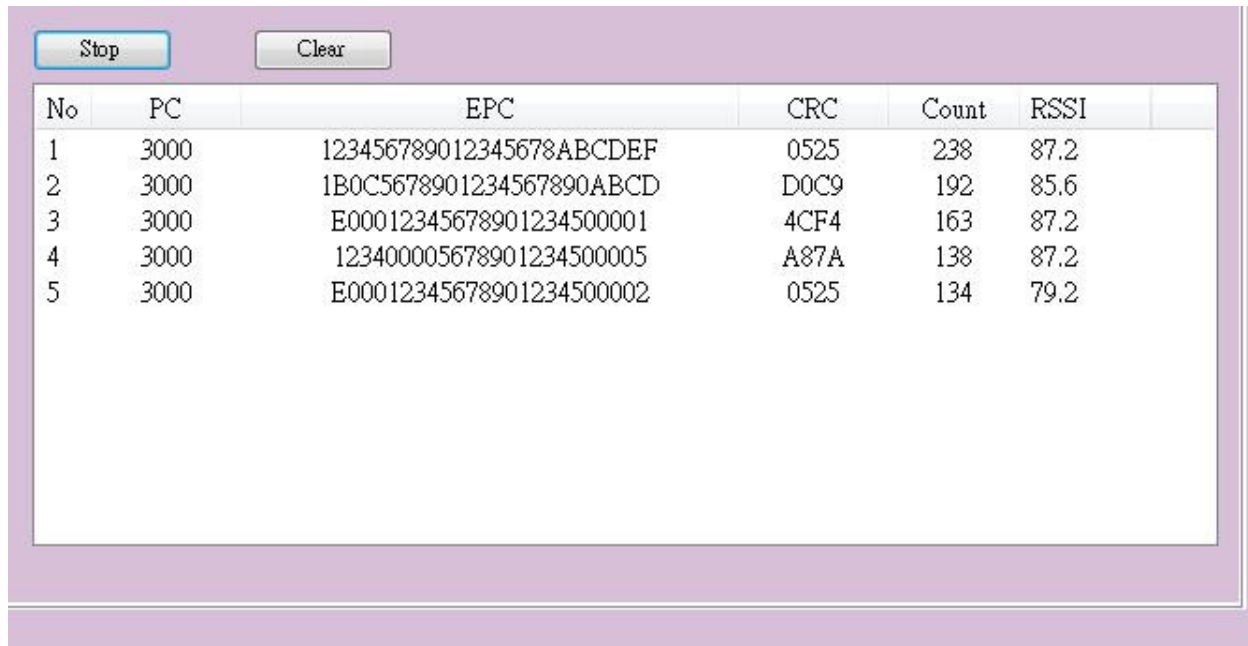

Figure 28: Inventory Control.

Figure 29: Start Read Tags

Click the "Stop" button to stop read tags, as figure 30.
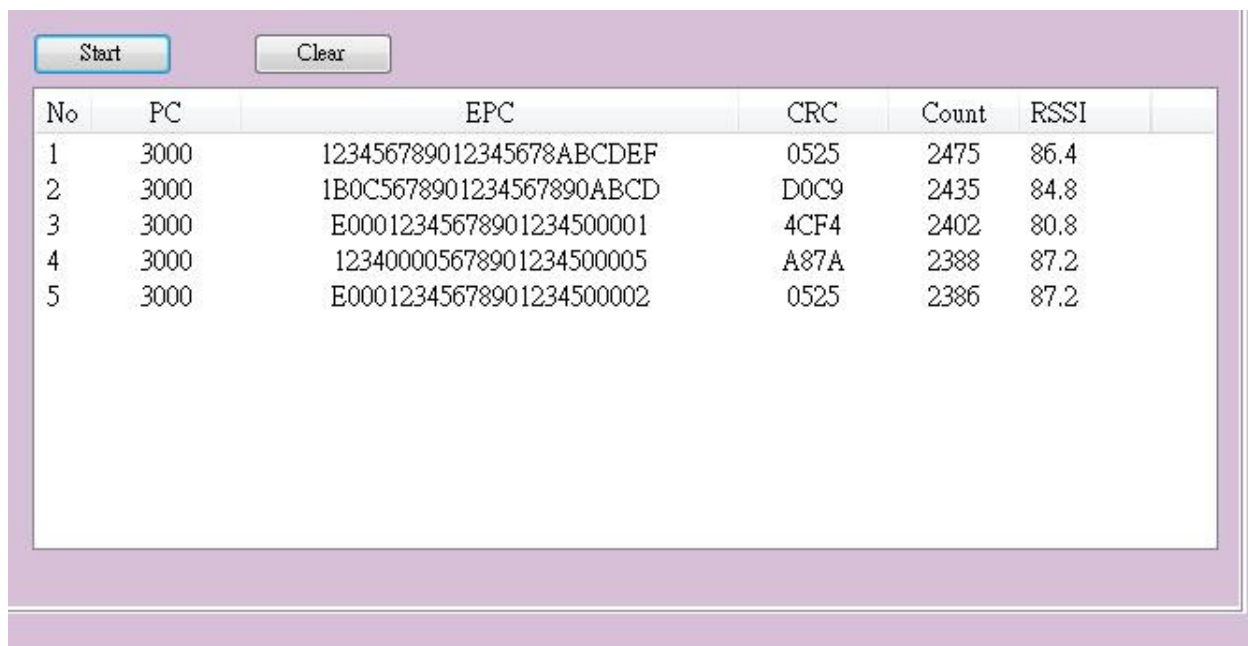
Figure 30: Stop Read Tags

3.4 Read/Write Control

Click the "Read/Write" button of the main form, as figure 31. The "Read/Write" panel is used to read tag data and write tag data. The user may select "Reserved – Memory Band 0", "EPC – Memory Band 1", "TID – Memory Band 2" and "User – Memory Band 3" from the Memory Bank combo box. When this combo box is modified, the group box enabled with the indicated memory bank in the "Read/Write" panel.
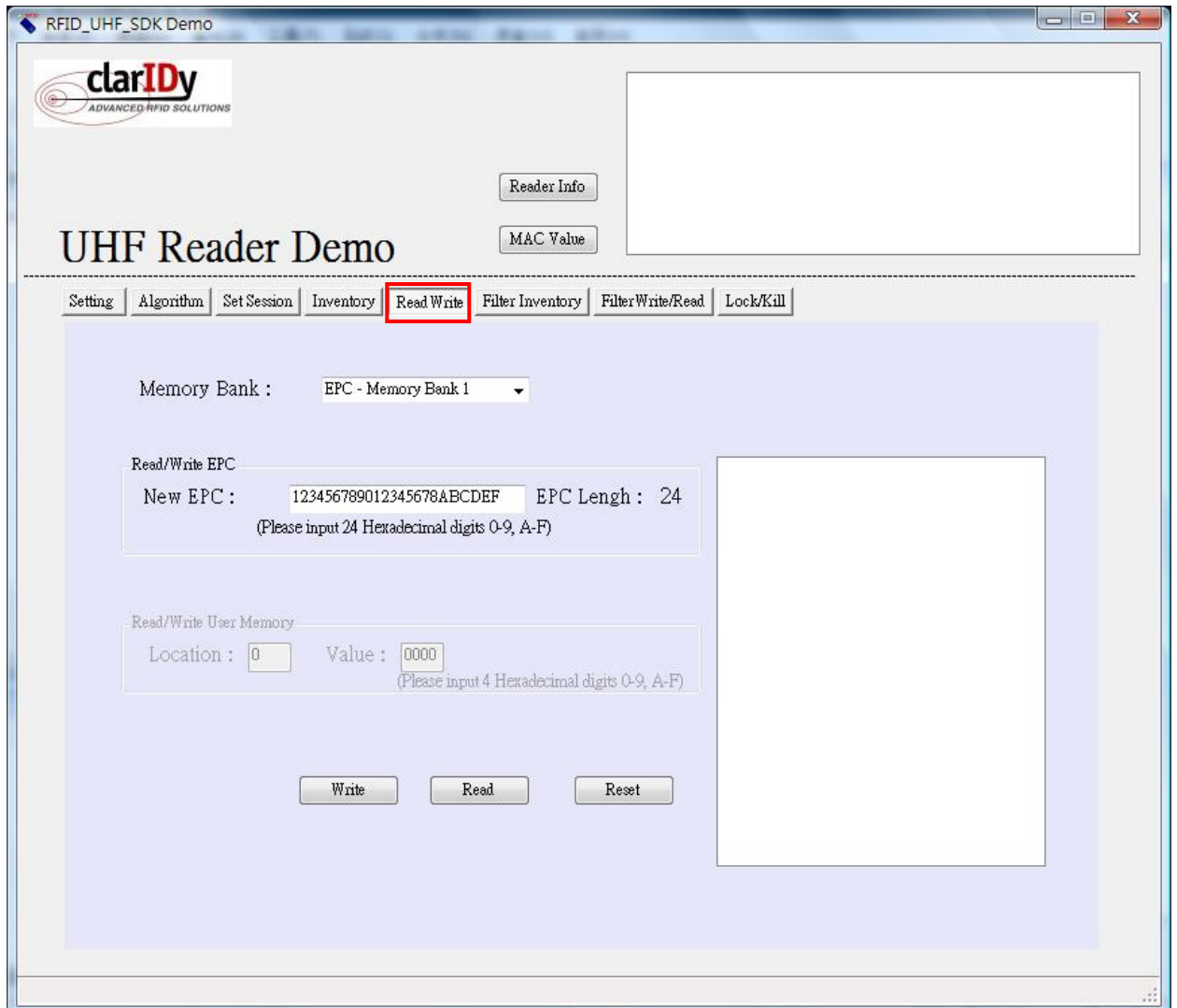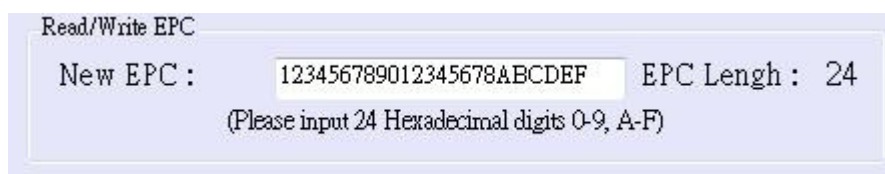

Figure 31: Read/Write Control

The user can write or read EPC code and User Memory. When the user wants to write EPC, the user must input 24 hexadecimal digits, as figure 32.

Figure 32: Write EPC

When the user wants to read EPC, the user clicks the "Read" button and value is showed to message list, as figure 33.

12340000567890123450005
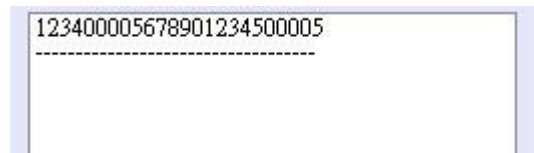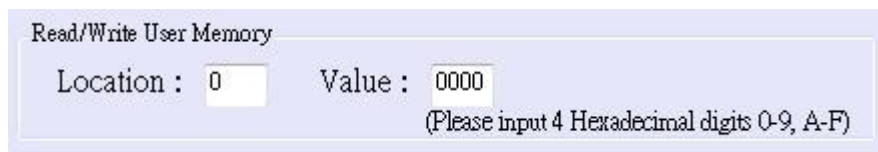
Figure 33: Read EPC

When the user wants to write User Memory, the user must input location and 4 hexadecimal digits, as figure 34

Read/Write User Memory
Location : 0   Value : 0000
(Please input 4 Hexadecimal digits 0-9, A-F)

Figure 34: Write User Memory

When the user wants to read User Memory, the user must input location and value is showed to message list, as figure 35.
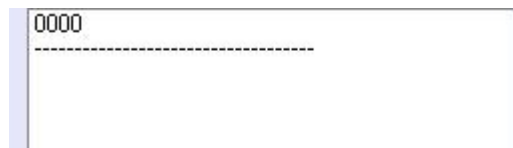

0000

Figure 35: Read User Memory

3.5 Filter Inventory

Click the "Filter Inventory" button of the main form, as figure 36. The "Filter Inventory" panel is used to read tag UID. The user may select to read tag UID by filter value. If the user selects "NONE" from the rule combo box, the reader will read all cards. If the user selects "NOT EQUAL" from the rule combo box, the reader will read card which is not match filter value. If the user selects "EQUAL" from the rule combo box, the reader will read card which is match filter value.

Follow the instructions step by step as following:

1. Select "Rule"
2. Select start location of filter value
3. Input filter value
4. Select "Memory Bank"
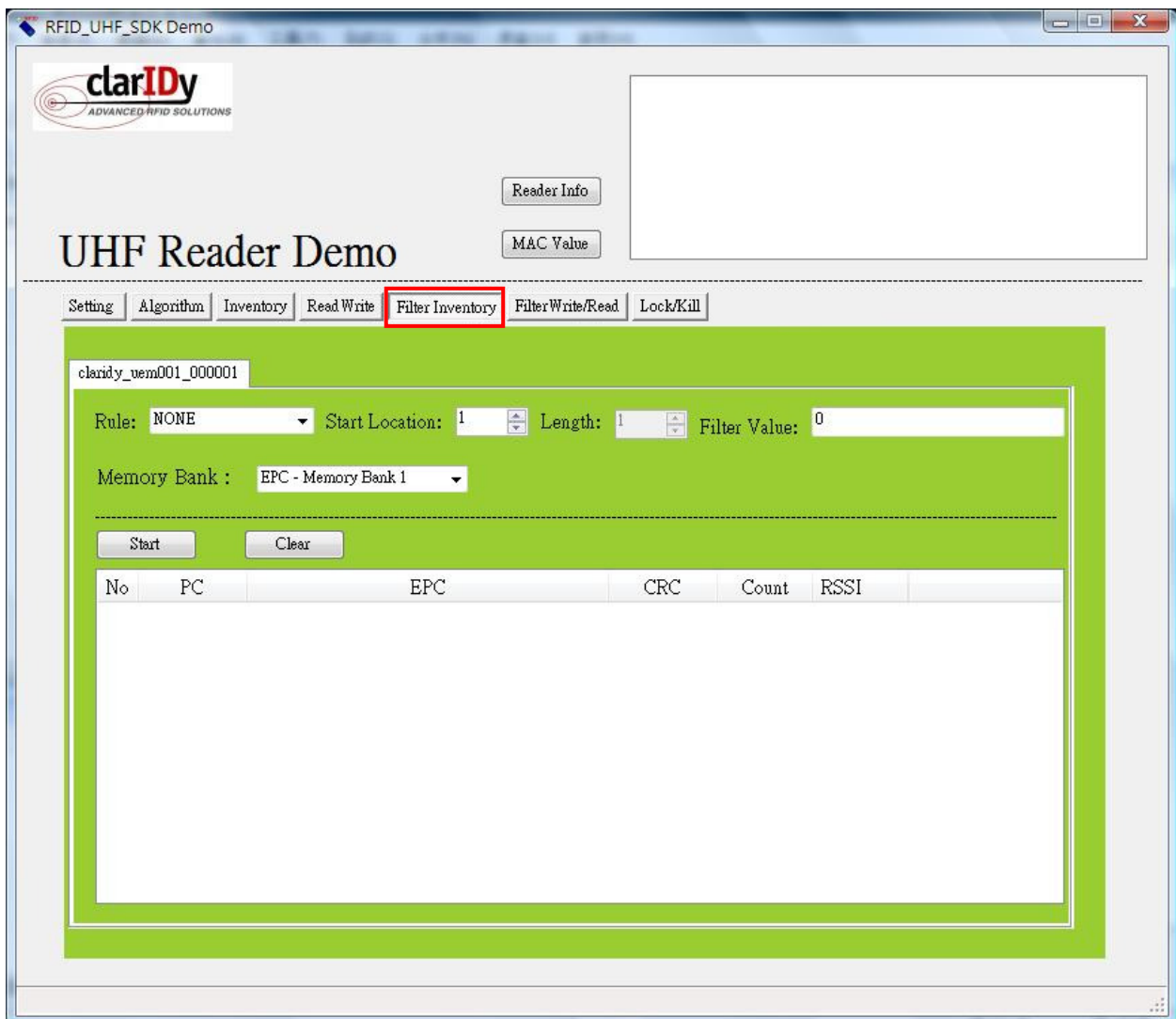5. Click the "Start" button, the result as figure 37.

Figure 36: Filter Inventory Control

Figure 37

3.6 Filter Write Read

Click the "Filter Write/Read" button of the main form, as figure 38. The "Filter Write/Read" panel is used to read and write tag. The user may select to read and write by filter value. If the user selects "NONE" from the rule combo box, the reader will read or write one of cards. If the user selects "NOT EQUAL" from the rule combo box, the reader will read or write one of cards which is not match filter value. If the user selects "EQUAL" from the rule combo box, the reader will read or write one of cards which is match filter value.

Follow the instructions step by step as following:

1. Select "Rule"
2. Select start location of filter value
3. Input filter value
4. Select "Memory Bank"
5. Click the "Read" button or "Write button."
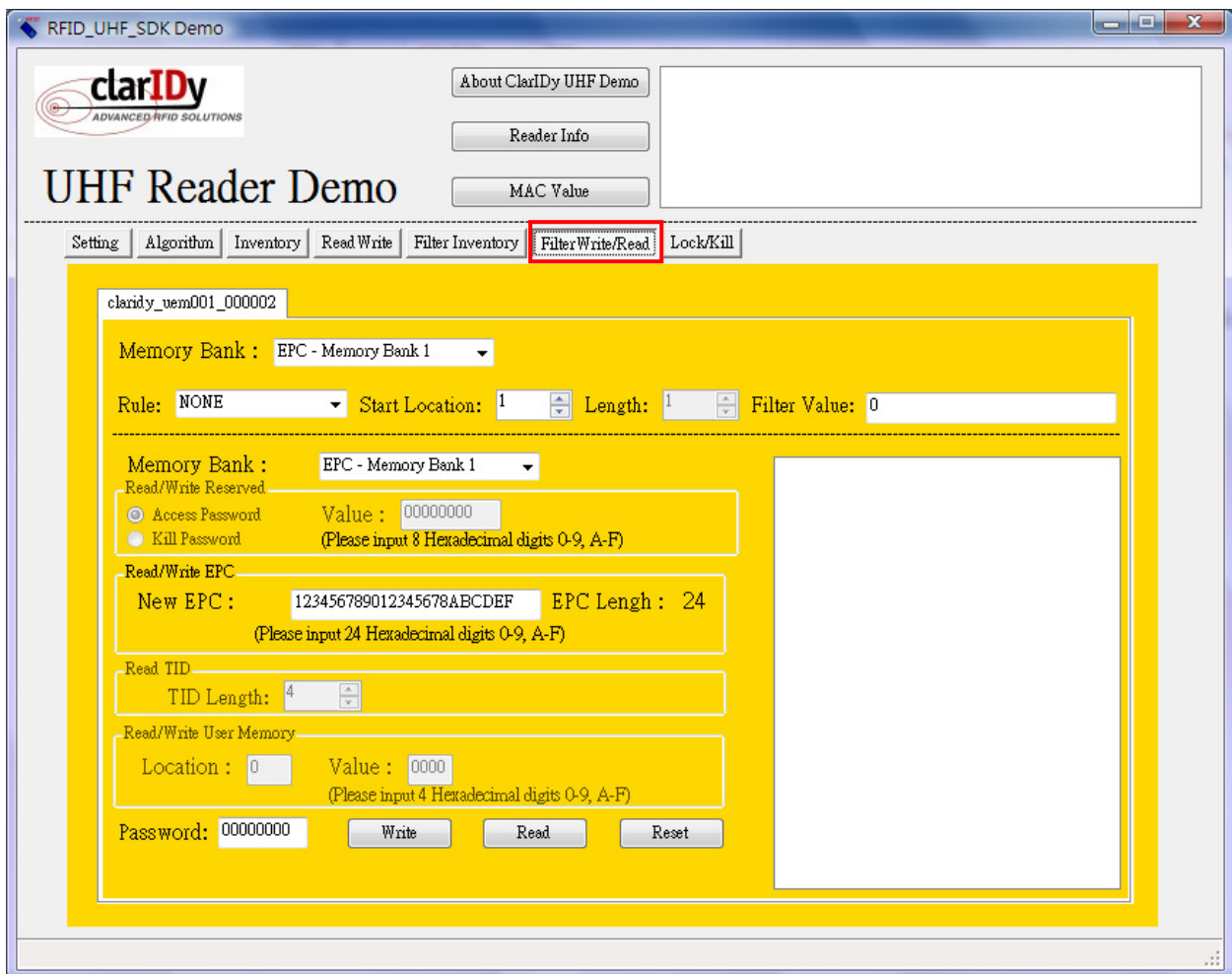
Figure 38: Filter Write/Read Control

3.7 Lock/Kill Tag

Click the "Lock/Kill" page of the main form, as figure 39. The "Lock/Kill" panel is used to Lock tag data and Kill tag.
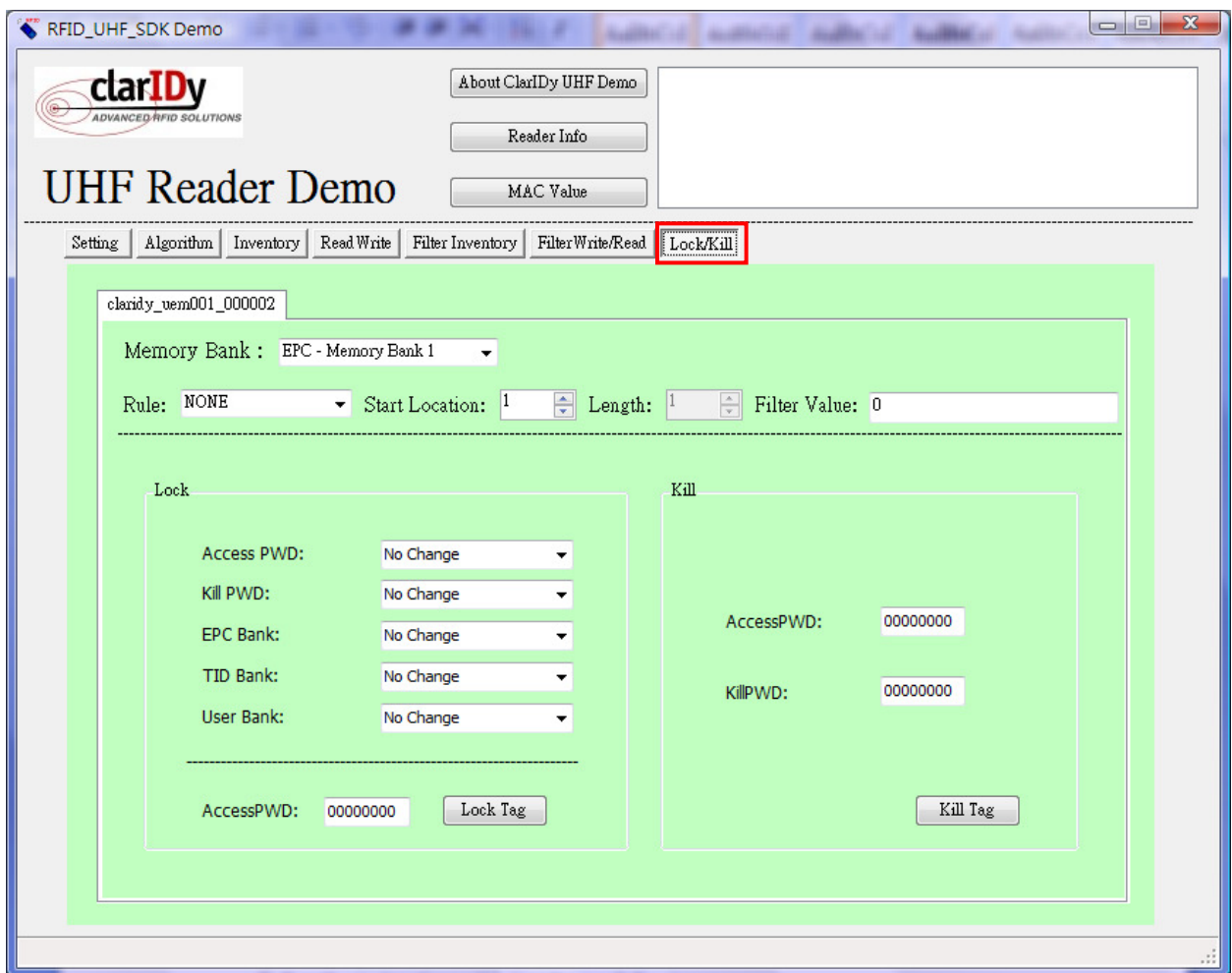
Figure 39

Follow the instructions step by step as following:

1. Select "Mask Memory Bank"
2. Select "Rule"
3. Select start location of filter value
4. Input "Filter Value"
5. If you want to lock the tag, please select state (Access PWD, Kill PWD, EPC Bank, TID Bank, User Bank) and input "AccessPWD". And if you want to kill the tag, please input "AccessPWD" and KillPWD".
6. If you want to kill or lock the tag, please select "OK", as Figure 40.

7. The kill and lock function would not be change permanently, please confirm again as figure 41.
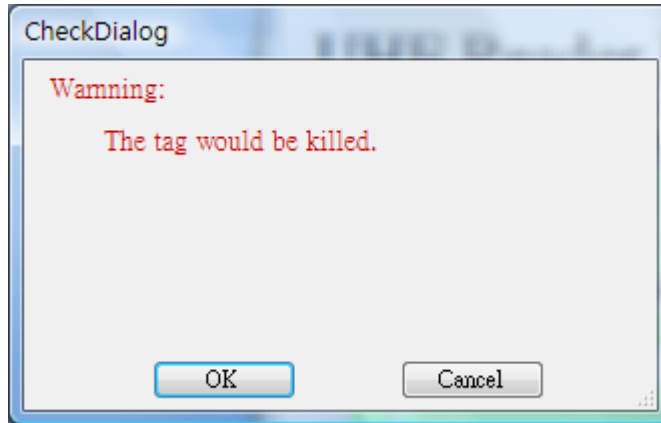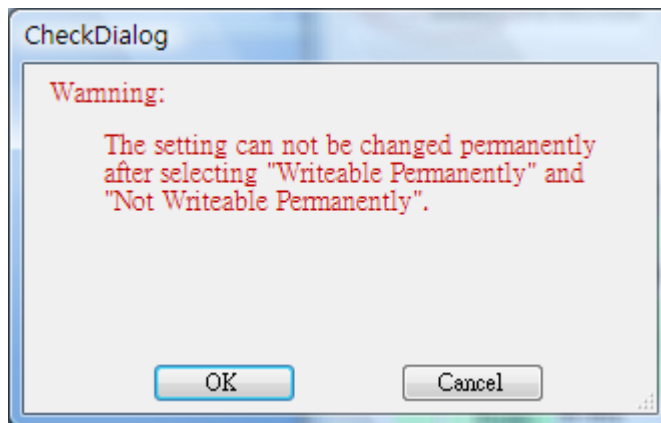

Figure 40

Figure 41

Note:

For individual passwords, the access permissions can be set as figure42.
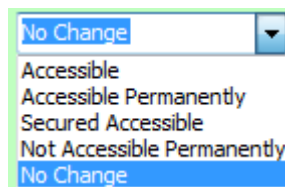

Figure 42

Accessible: The password may be read and written when the tag is in either the open or secured states.

Accessible Permanently: The password may be read and written when the tag is in either the open

or secured states and this access permission should be set permanently.

Secured Accessible: The password may be read or written only when the tag is in the secured state.

Not Accessible Permanently: The password may not be read or written and this access permission should be set permanently.

No Change: The password's access permission should remain unchanged.

The memory bank is writeable when the tag is in either the open or secured states, as figure 43.

Figure 43

Writeable: The memory bank is writeable when the tag is in either the open or secured states.

Writeable Permanently: The memory bank is writeable when the tag is in either the open or secured states and this access permission should be set permanently.

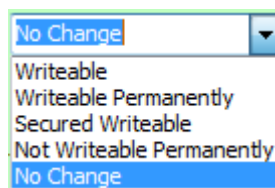**Secured Writeable:** The memory bank is writeable only when the tag is in the secured state.

Not Writeable Permanently: The memory bank is not writeable and this access permission should be set permanently.

No Change: The memory bank's access permission should remain unchanged.

4. Error Code

The following lists provide error codes of UHF Reader Demo Program. These values are defined in the description.

Code (dec)	Description
0	Success
-9999	Attempted to open a reader that is already open
-9998	Buffer supplied is too small
-9997	General failure
-9996	Failed to load reader bus driver
-9995	Library cannot use version of reader bus driver present on system
-9994	Operation cannot be performed while library is in emulation mode
-9993	Antenna number is invalid
-9992	Reader handle provided is invalid
-9991	One of the parameters to the function is invalid
-9990	Attempted to open a non-existent reader
-9989	Library has not been successfully initialized
-9988	Function not supported
-9987	Operation was cancelled by call to cancel operation, close reader, or shut down the library
-9986	Library encountered an error allocating memory
-9985	The operation cannot be performed because the reader is currently busy
-9984	The underlying reader module encountered an error
-9983	The reader has been detached from the system
-9982	The RFID library function is not allowed at this time.
-9981	The reader module's MAC firmware is not responding to requests.
-9980	The MAC firmware encountered an error while initiating the nonvolatile memory update. The MAC firmware will return to its normal idle state without resetting the reader module.
-9979	An attempt was made to write data to an address that is not in the valid range of reader module nonvolatile memory addresses.
-9978	The MAC firmware encountered an error while trying to write to the reader module's nonvolatile memory region.
-9977	The underlying transport layer detected that there was an overflow error resulting in one or more bytes of the incoming data being dropped. The operation was aborted and all data in the pipeline was flushed.

-7999	Fail to find reader
-7998	Fail to allocate memory
-7997	Write Data failure
-7996	Read Data failure
-7995	Lock Tag failure
-7994	Kill Tag failure

5. Uninstall

Uninstall ClarIDy UHF Demo program step by step as the following instructions:

1. Double click "Setup.exe" which is in the disc.
2. Select "Remove ClarIDy UHF Demo", as figure 44.
3. Waiting system to remove, as figure 45.
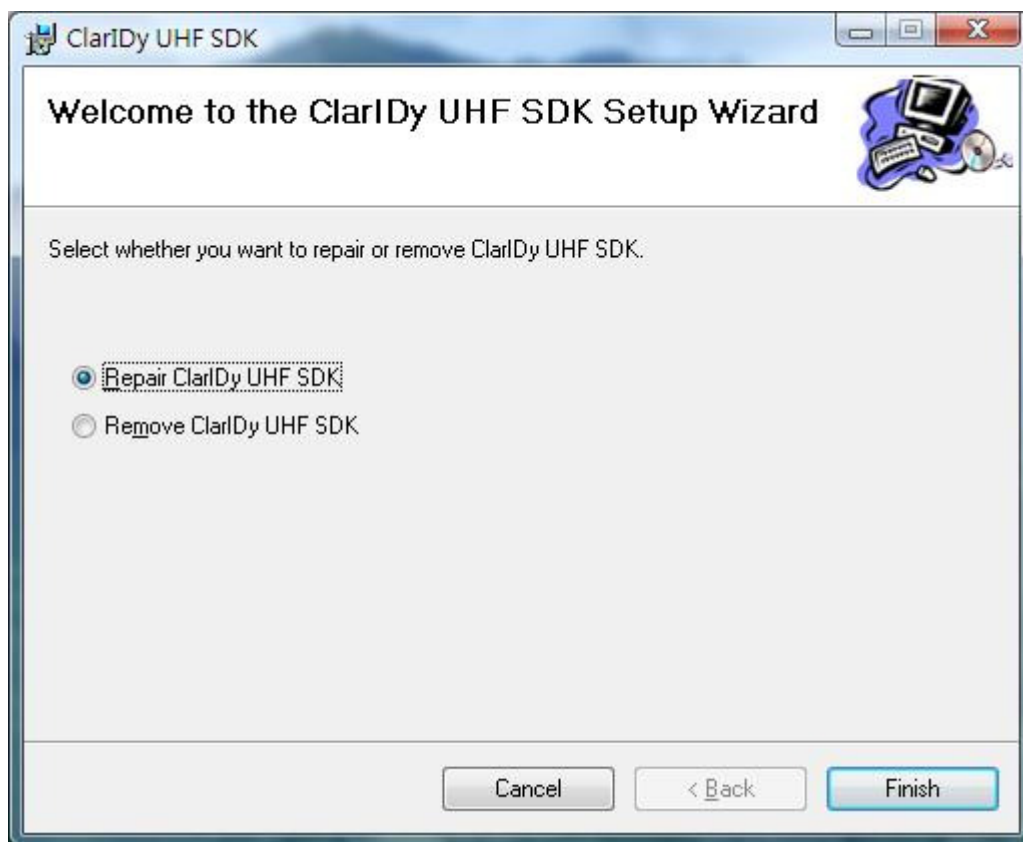4. The "ClarIDy UHF Demo" is completed removed and click "Close" to close window, as figure 46.
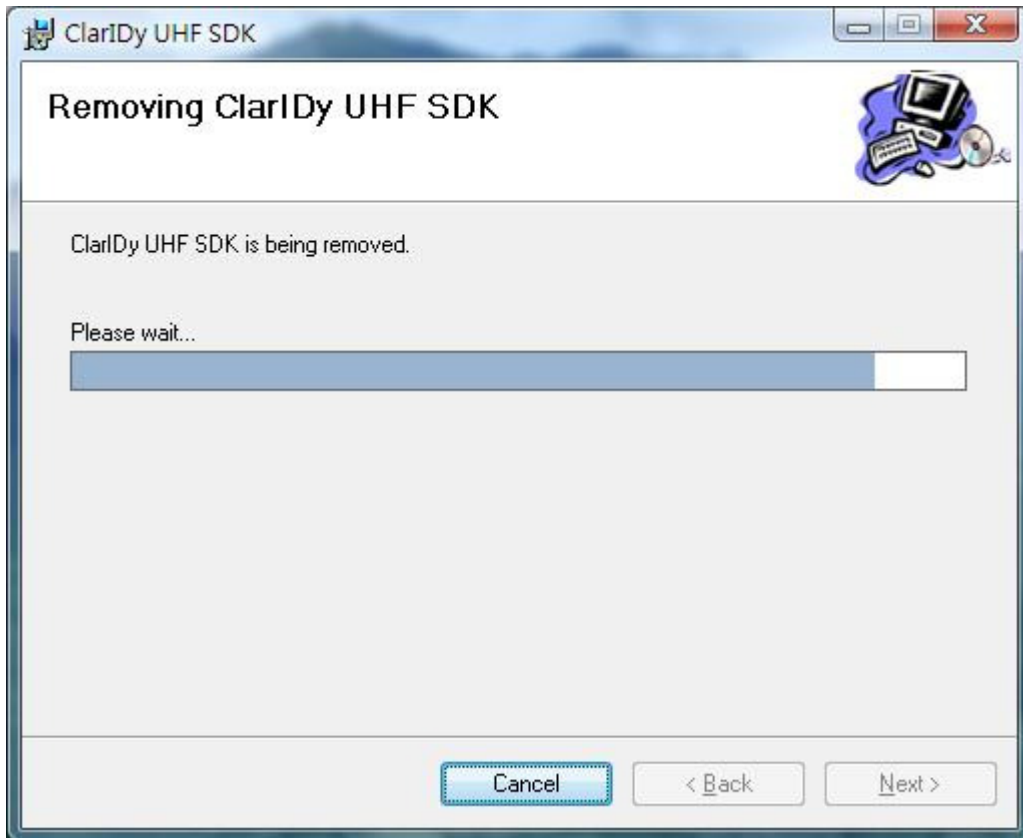

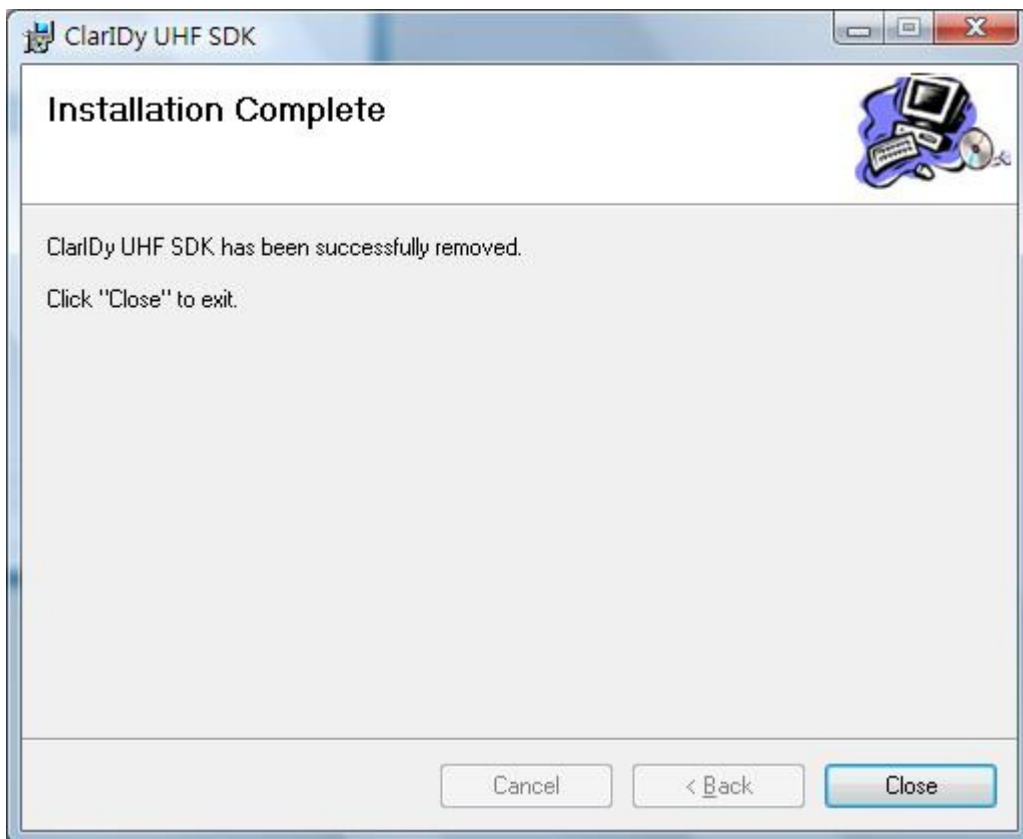Figure 44

ClarIDy UHF USB Reader Demo Program

Figure 45

Figure 46

Federal Communication Commission Interference Statement

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 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 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.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority
to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

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

" This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance. "