



Programming Manual for 4080-601606 13.56MHz RFID Reader

1 Introduction

This document will introduce how use Unitech's SDK to implement program for 4080-601606 13.56MHz RFID module. This RFID card support ISO15693 specification, so you can use this card to read ISO 15693 compliance tag - e.x. Tag-It, I-Code, Performa, MicroID 350/450. You can use this SDK to implement your C++ application program to query a tag ID and protocol from any supported tag as well as provide full read and write capabilities.

2 SDK and Sample Program

After unzip SDK, you can find below 4 files and one folder

UnitechRFID.CAB : RFID demo program RFIDSample.EXE and DLL
RFIDAPI.DLL : DLL for RFID application program
RFIDAPI.LIB : LIB file for C++ programming
RFIDAPI.H : Include for C++ programming
RFID_Sample_Souce : Source code for RFIDSample

You may test RFID function by installing UnitechRFID.CAB to PA962 according below steps

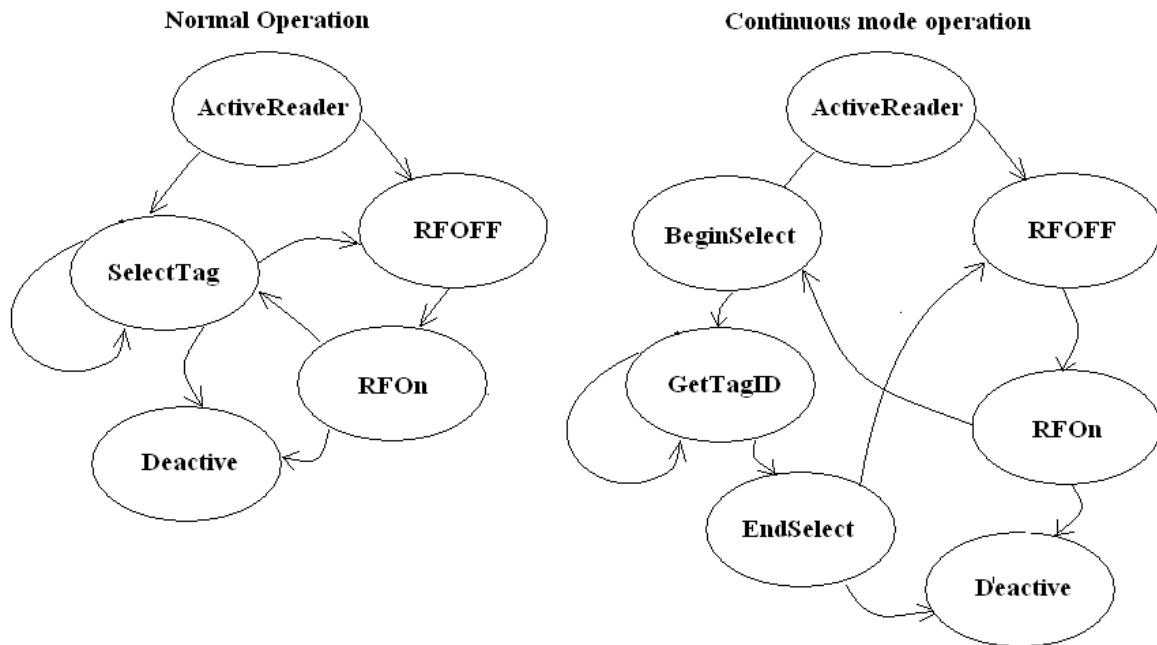
1. Copy UnitechRFID.CAB to PA962
2. Open File Explorer to browse the folder which UnitechRFID.CAB is stored
3. Double tapping file UnitechRFID.CAB to install it.

3 Operation Flow

4080-601606 RFID reader will be treated as serial port after plugged into WinCE terminal and PA962 will fix this serial port on COM6. But, you don't need to worry about how to do level communication with reader via COM6. Just use Unitech's API to control reader's behavior.

According reader's design, you need to ACTIVE reader by ActiveReader API as the first step and DEACTIVE reader if it is unnecessary to use reader. During operation, you can use RFOff to turn off radio to save power and then call RFOOn to turn on radio for reading tag.

There are 2 kinds of mode for RFID's operation flow – Normal mode and Continuous mode. You can cross reference to below flow and API list to understand how to implement your application program.



a. **Normal Mode :**

Reader will not read any RFID tag until executing SelectTag. It will immediately return, no matter what tag is read or not. Application will get tag's unique ID after from SelectTag API when RFID tags are closed to the reading range. Then Application can read (ReadBlock) or write (WriteBlock) data into RFID tag.

b. **Continuous mode :**

It will continuously read tag within readable range and put data to internal buffer, the same tag will be read many times if this tag is always close to reader. Application need to call GetTagID (one time one tag ID) to get out of all tag ID.

4 API list

Before introducing API, section 4.1 will explain some constant which will be used on each API as parameter or return code.

4.1 Constant for Parameter or return code

- This reader support ISO15693, so you need to specify what kind of tag do you want to read by using TagProtocol Property. Below are available TagProtocol and its value

Unitech PA962 and on TagProtocol Property Supported Values:

| | |
|-------------|-----|
| TAGIT | = 1 |
| ICODE | = 2 |
| Performa | = 3 |
| MicroID 350 | = 4 |
| MicroID 450 | = 5 |
| AUTO | = 6 |
| ISO15693 | = 7 |
| EPC | = 8 |

- Error Code Property Supported Values:
 - ERR_CMD_SUCCESS = 0
 - ERR_CMD_READER_NOT_ACTIVE = 1
 - ERR_CMD_FAIL = 2
 - ERR_CMD_CANT_FIND_READER = 3
 - ERR_CMD_CANT_OPEN_PORT = 4
 - ERR_CMD_INVALID_PORT = 5
 - ERR_CMD_INVALID_PROTOCOL = 6
 - ERR_CMD_INVALID_PARAMETERS = 7
 - ERR_CMD_UNSUPPORTED_COMMAND = 8
 - ERR_CMD_NO_TAG = 9
 - ERR_CMD_IN_SCAN_MODE = 10
 - ERR_CMD_NOT_IN_SCAN_MODE = 11
 - ERR_CMD_READ_FAIL = 12
 - ERR_CMD_WRITE_FAIL = 13

4.2 API table

Below are all of API listing table

| No | Function Name | Note | Status |
|---------------------------------|--------------------|---|--------|
| General Function | | | |
| 1 | ActivateReader | Opens the com port and activate Reader | |
| 2 | Deactivate | Deactivates the Reader and closes the com port | |
| 3 | SelectTag | Retrieves information about the current tag | |
| 4 | GetFirmware | Reads the firmware label from the reader | |
| 5 | RFOOn | Turns on the RF field of the reader | |
| 6 | RFOff | Turns off the RF field of the reader | |
| 7 | ReadBlocks | Reads a list of blocks from a supported RFID tag | |
| 8 | WriteBlocks | Writes data to a set of blocks on a supported RFID tag | |
| 9 | GetErrStringByCode | Converts an error code into a text message | |
| Continuous Mode Function | | | |
| 10 | BeginSelect | Enables Continuous Scanning Mode for a set protocol | |
| 11 | GetTagID | In Continuous Scanning Mode, checks to see if any tags have been found by the reader. If so, it returns the next tag ID scanned | |
| 12 | EndSelect | Disables Continuous Scanning Mode. Use this function to return the reader to the standard mode of operation when finished scanning for tags | |

4.3 General Function

4.3.1 Activate Reader

Function Description:

Open the com port and activate Reader

Function call:

LONG ActivateReader(int iCom)

Parameter(Input)

Fix on 6 for PA962

Return code:

Refer to Error Code Property

4.3.2 Deactivate Reader

Function Description:

Deactivates the Reader and closes the com port

Function call:

void Deactivate()

Return code:

None

4.3.3 Select Tag ID

Function Description:

Reader will automatically select one available tag from field and then read tag ID

Function call:

long SelectTag(int iTagProtocol,LPTSTR &lpBuf)

Parameter(Input)

iTagProtocol : refer to TagProtocol Property

Parameter(output)

lpBuf : tag id string

Return code:

Refer to Error Code Property

Example code:

```
LPTSTR strTAG;  
int protocol = 6;  
long ErrCode = SelectTag(protocol,strTAG);  
if (ErrCode == 0){  
}
```

4.3.4 Get Firmware Version

Function Description:

Read reader's firmware version

Function call:

long GetFirmware(LPTSTR &lpBuf)

Parameter(output)

lpBuf : firmware string

Return code:

Refer to Error Code Property

Example code:

```
LPTSTR strFirmware;  
long ErrCode = GetFirmware(strFirmware);  
if (ErrCode == 0) {  
}
```

4.3.5 RFO n

Function Description:

Turns on the radio

Function call:

long RFO n()

Return code:

Refer to Error Code Property

4.3.6 RFOff

Function Description:

Turns off radio

Function call:

long RFOff()

Return code:

Refer to Error Code Property

4.3.7 ReadBlocks

Function Description:

Read pre-defined data blocks from RFID tag

Function call:

long ReadBlocks(int iTagProtocol,int StartIndex,byte BlocksData[])

Parameter(Input)

iTagProtocol : reference TagProtocol Property

StartIndex : Start read block index

Parameter(output)

BlocksData : read block data

Return code:

Refer to Error Code Property

Example code:

```
byte data[4];
int protocol = 7;
int iBlockIndex = 0;
long ErrCode = ReadBlocks(protocol,iBlockIndex,data);
if (ErrCode == 0) {
}
```

4.3.8 WriteBlocks

Function Description:

Writes data blocks into RFID tag

Function call:

long WriteBlocks(int iTagProtocol,int StartIndex,int numBlocks,byte BlocksData[])

Parameter(Input)

iTagProtocol : reference TagProtocol Property

StartIndex : Start write block index

numBlocks : write how much block

Parameter(output)

BlocksData : write block data

Return code:

Refer to Error Code Property

Example code:

```
byte data[4];
int protocol = 7;
int iBlockIndex = 0;
long ErrCode = WriteBlocks(protocol,iBlockIndex,1,data);
if (ErrCode == 0) {
}
```

4.3.9 GetErrStringByCode

Function Description:

Converts an error code into a text message

Function call:

GetErrStringByCode(int ErrCode,LPTSTR &lpBuf)

Parameter(Input)

ErrCode : reference Error Code Property

Parameter(output)

lpBuf : error message

Return code:

Refer to Error Code Property

4.4 Continuous Mode

4.4.1 Begin Continuous Mode

Function Description:

Enables read to continuously read tag into system buffer according pre-define protocol

Function call:

long BeginSelect(int iTagProtocol)

Parameter(Input)

iTagProtocol reference TagProtocol Property

Return code:

Refer to Error Code Property

4.4.2 Get Tag ID

Function Description:

After execute BeginSelect, it will continuously read tag ID into system buffer. If the same tag is put within reading range without remove, it will be read into system buffer several times until removed or EndSelect is called.

Function call:

long GetTagID(LPTSTR &lpBuf)

Parameter(output)

lpBuf : tag id string

Return code:

Refer to Error Code Property

4.3.1 End Continuous Mode

Function Description:

Disables Continuous Mode.

Function call:

long EndSelect()

Return code:

Refer to Error Code Property