

4-4-14. Reset

0xBA	Len	0xFF	Checksum
------	-----	------	----------

No return

Private Sub Form1_Load

Set Comport

{ File : from_load.txt }

RESET

Private Sub Button2_Click

rfid1443a_reset()

Private Sub rfid1443a_reset()

Send Reset Command

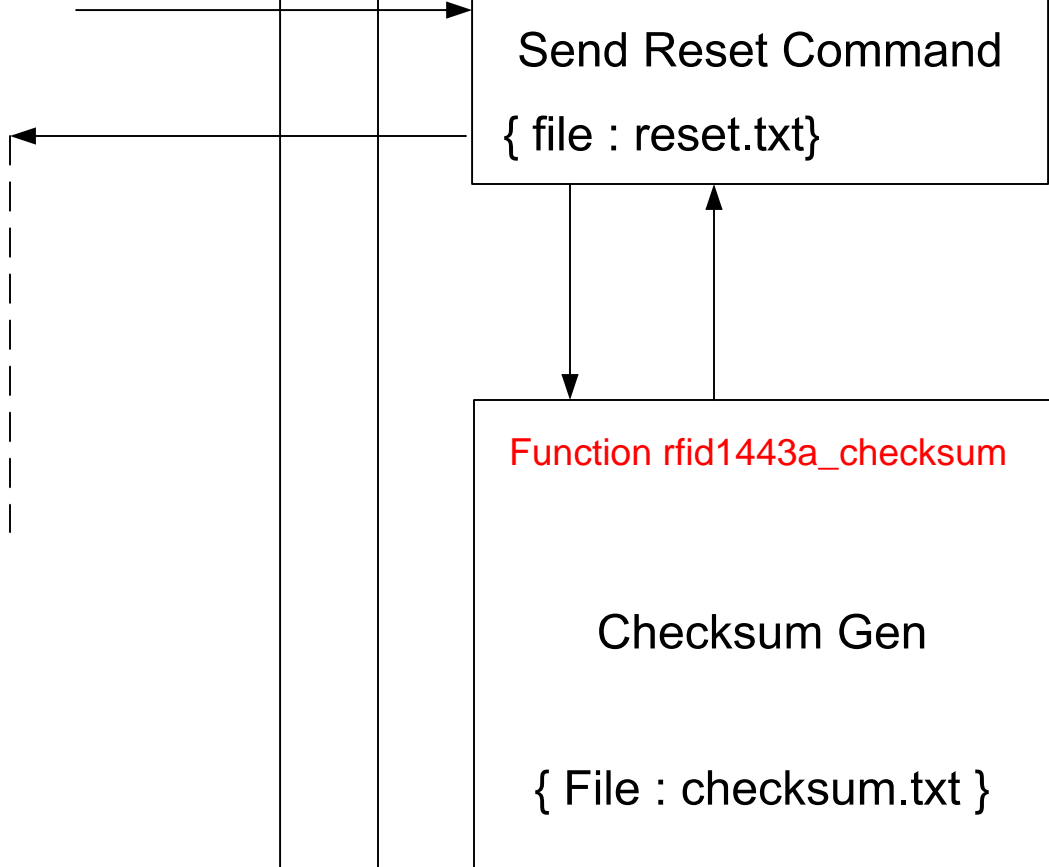
{ file : reset.txt }

Function rfid1443a_checksum

Checksum Gen

{ File : checksum.txt }

End Sub



Baud rate:	9,600 ~ 115,200 bps
Data:	8 bits
Stop:	1 bit
Parity:	None
Flow control:	None

Note

Driver USB To RS232 Driver_FT232
Check Comport Device Manager

Private Sub Form1_Load(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles MyBase.Load

```

SerialPort1.PortName = "...."           'Com port = comX
SerialPort1.BaudRate = .....            'BPS
SerialPort1.DataBits = .....           'Data bit
SerialPort1.Parity = IO.Ports.Parity. .... 'Parity None
SerialPort1.StopBits = IO.Ports.StopBits. .... 'Stopbit One
SerialPort1.Open()

```

End Sub

4-4-14. Reset

0xBA	Len	0xFF	Checksum
------	-----	------	----------

No return

Private Sub rfid1443a_reset()

Dim st As Date

```

rfid1443a_cmd(0) = &H....           'Header
rfid1443a_cmd(1) = &H....           'Len
rfid1443a_cmd(2) = &H....           'Command
rfid1443a_cmd(3) = rfid1443a_checksum(3) 'Check Sum
SerialPort1.Write(rfid1443a_cmd, 0, 4) 'Send Command

```

st = Now.AddMilliseconds(2000)

Do

Loop While Now < st

End Sub

Function rfid1443a_checksum(ByVal lastindex As Byte) As Byte

Dim i As Byte

Dim rf_checksum As Byte

For i = 0 To lastindex

```

    rf_checksum = rf_checksum ..... rfid1443a_cmd(i) 'Check Sum

```

Next i

rfid1443a_checksum = rf_checksum

End Function

Ex $Y = A \text{ Xor } B$

A	B	Y
0	0	0
0	1	1
1	0	1
1	1	0

4-4-1. Select Mifare card

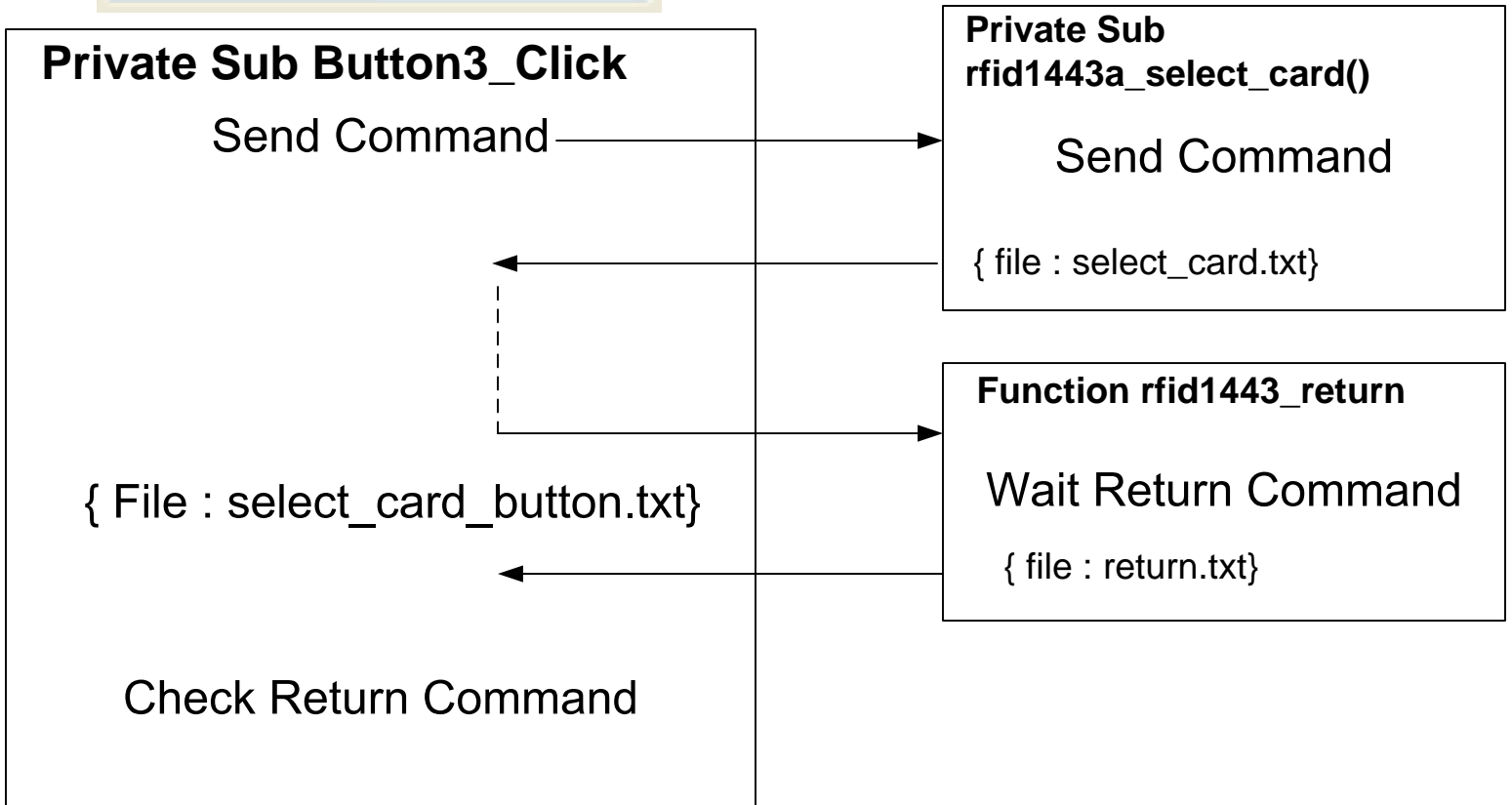
0xBA	Len	0x01	Checksum
------	-----	------	----------

Return:

0xBD	Len	0x01	Status	UID	Type	Checksum
------	-----	------	--------	-----	------	----------

- Status: 0x00: Operation succeed
 0x01: No tag
 0x0A: Collision occur
 0xF0: Checksum error
- UID: The uniquely serial number of Mifare card,
 4 bytes for Mifare 1k & Mifare 4k, 7 bytes for UltraLight & DesFire
- Type: 0x01: Mifare Standard 1K card
 0x02: Mifare Pro card
 0x03: Mifare UltraLight card
 0x04: Mifare Standard 4K card
 0x05: Mifare ProX card
 0x06: Mifare DesFire card

SELECT MIFARE CARD



Type: 0x01: Mifare Standard 1K card
 0x02: Mifare Pro card
 0x03: Mifare UltraLight card
 0x04: Mifare Standard 4K card
 0x05: Mifare ProX card
 0x06: Mifare DesFire card

Private Sub Button3_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button3.Click

rfid1443a_select_card()

If rfid1443_return(&H1) = True Then

 ListBox1.Items.Add("Select Mifare card Success")

 ListBox1.Items.Add("SN=" & Hex(rfid1443a_return(4)) & ":" & Hex(rfid1443a_return(5)) & ":" & Hex(rfid1443a_return(6)) & ":" & Hex(rfid1443a_return(7)))

 Select Case rfid1443a_return(8)

Case &H.... 'Return code Standard 1K card

 ListBox1.Items.Add(rfid1443a_return(8) & "Mifare Standard 1K card")

Case &H.... 'Return code Pro card

 ListBox1.Items.Add(rfid1443a_return(8) & "Mifare Pro card")

Case &H.... 'Return code UltraLight card

 ListBox1.Items.Add(rfid1443a_return(8) & "Mifare UltraLight card ")

Case &H.... 'Return code Standard 4K card

 ListBox1.Items.Add(rfid1443a_return(8) & "Mifare Standard 4K card")

Case &H.... 'Return code ProX card

 ListBox1.Items.Add(rfid1443a_return(8) & "Mifare ProX card")

Case &H.... 'Return code DesFire card

 ListBox1.Items.Add(rfid1443a_return(8) & "Mifare DesFire card")

 End Select

Else

 ListBox1.Items.Add("Select Mifare card Error")

 If index_return > 0 Then

 Select Case rfid1443a_return(3)

Case &H.... 'Return code No tag Error

 ListBox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code collision occur Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Collision occur")

Case &H.... 'Return code Checksum Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")

 End Select

 End If

End If

.....

.....

End Sub

Return:

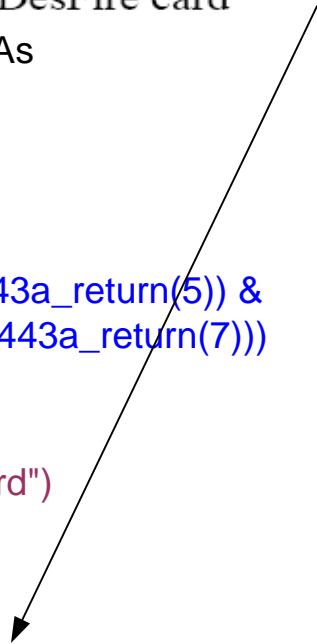
0xBD	Len	0x01	Status	UID	Type	Checksum
------	-----	------	--------	-----	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x0A: Collision occur

0xF0: Checksum error



Type: 0x01: Mifare Standard 1K card
 0x02: Mifare Pro card
 0x03: Mifare UltraLight card
 0x04: Mifare Standard 4K card
 0x05: Mifare ProX card
 0x06: Mifare DesFire card

Return:

0xBD	Len	0x01	Status	UID	Type	Checksum
------	-----	------	--------	-----	------	----------

Status: 0x00: Operation succeed
 0x01: No tag
 0x0A: Collision occur
 0xF0: Checksum error

Private Sub Button3_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button3.Click

rfid1443a_select_card()

If rfid1443_return(&H1) = True Then

.....

End Sub

4-4-1. Select Mifare card

0xBA	Len	0x01	Checksum
------	-----	------	----------

Private Sub rfid1443a_select_card()

rfid1443a_cmd(0) = &H.... 'Header
rfid1443a_cmd(1) = &H.... 'Len
rfid1443a_cmd(2) = &H.... 'Command

rfid1443a_cmd(3) = rfid1443a_checksum(2) 'Check Sum
 SerialPort1.Write(rfid1443a_cmd, 0, 4) 'Send Command

End Sub

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return(ByVal rf1443cmd As Byte) As Boolean

```

Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date         Dim ret As Boolean                    index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
    If SerialPort1.BytesToRead > 0 Then
        rx_byte = SerialPort1.ReadByte
        If index_return = 3 Then
            Select Case rf1443cmd
                Case &H1 'Select Mifare card
                    lenreturnbyte = ....          ' Len return command
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                Case &H2 'Login to a sector
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H3 'Read a data block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H4 'Write a data block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H5 'Read a value block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H6 'Write a value block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H7 'Write master key (key A)
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H8 'Increment value
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &H9 'Decrement value
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
                Case &HA 'Copy value
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = ....          ' Len return command
            End Select
        End If
        rf1443a_return(index_return) = rx_byte
        index_return = index_return + 1
        If index_return = lenreturnbyte Then exitloop = True
    End If
    If Now >= timeend Then
        exitloop = True
    End If
Loop While (exitloop <> True)
SerialPort1.DiscardInBuffer()
If index_return = lenreturnbyte Then
    ret = True
End If
rfid1443_return = ret
End Function

```

Case &H1 'Select Mifare card

lenreturnbyte = ' Len return command

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success

Case &H2 'Login to a sector

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H3 'Read a data block

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H4 'Write a data block

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H5 'Read a value block

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H6 'Write a value block

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H7 'Write master key (key A)

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H8 'Increment value

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H9 'Decrement value

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &HA 'Copy value

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

End Select

End If

rf1443a_return(index_return) = rx_byte

index_return = index_return + 1

If index_return = lenreturnbyte Then exitloop = True

End If

If Now >= timeend Then

exitloop = True

End If

Loop While (exitloop <> True)

SerialPort1.DiscardInBuffer()

If index_return = lenreturnbyte Then

ret = True

End If

rfid1443_return = ret

End Function

4-4-1. Select Mifare card

0xBA	Len	0x01	Checksum
------	-----	------	----------

Return:

0xBD	Len	0x01	Status	UID	Type	Checksum
------	-----	------	--------	-----	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x0A: Collision occur

0xF0: Checksum error

UID: The uniquely serial number of Mifare card,
4 bytes for Mifare 1k & Mifare 4k, 7 bytes for UltraLight & DesFire

Type: 0x01: Mifare Standard 1K card

0x02: Mifare Pro card

0x03: Mifare UltraLight card

0x04: Mifare Standard 4K card

0x05: Mifare ProX card

0x06: Mifare DesFire card

Sector	Block	Byte Number within a Block															Description	
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		15
15	3	Key A					Access Bits			Key B							Sector Trailer 15	
	2																	Data
	1																	Data
	0																	Data
14	3	Key A					Access Bits			Key B							Sector Trailer 14	
	2																	Data
	1																	Data
	0																	Data

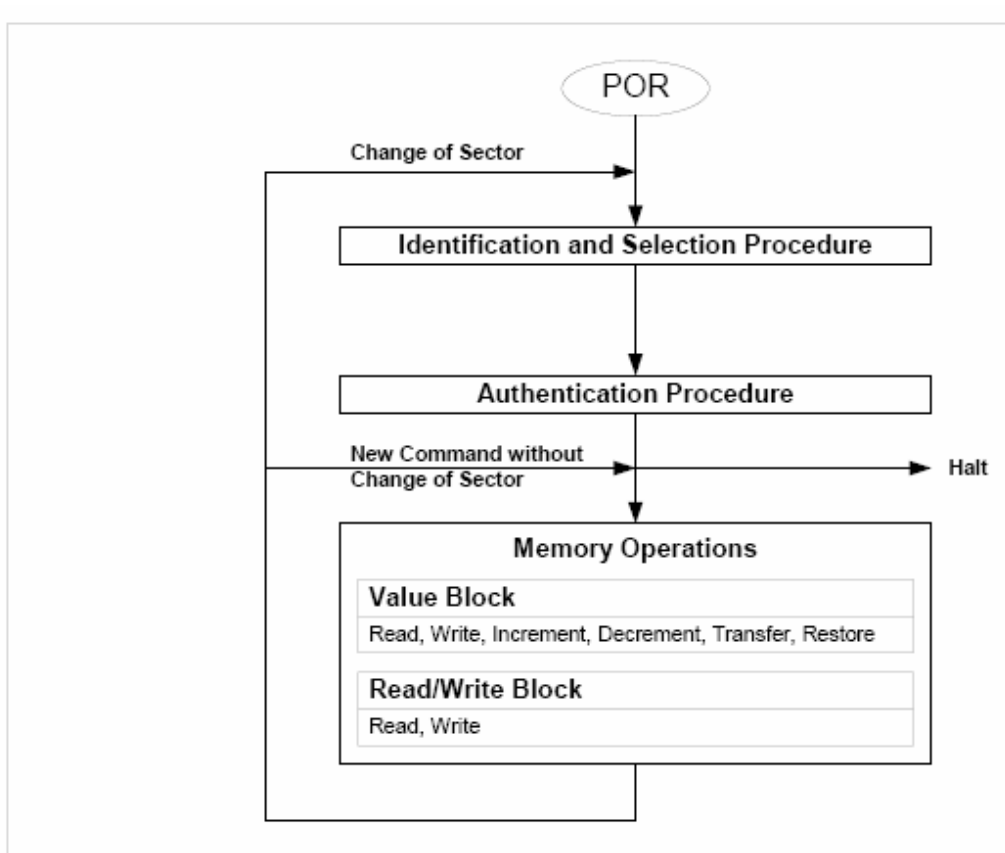


Fig 8. Memory access

4-4-2. Login to a sector

0xBA	Len	0x02	Sector	Type	Key	Checksum
------	-----	------	--------	------	-----	----------

Sector: Sector need to login

Type: Key type (0xAA: authenticate with KeyA, 0xBB: authenticate with KeyB)

Key: Password, 6 bytes

Return:

0xBD	Len	0x02	Status	Checksum
------	-----	------	--------	----------

Status: 0x02: Login succeed

0x01: No tag

0x03: Login fail

0xF0: Checksum error

4-4-2. Login to a sector

0xBA	Len	0x02	Sector	Type	Key	Checksum
------	-----	------	--------	------	-----	----------

Sector: Sector need to login

Type: Key type (0xAA: authenticate with KeyA, 0xBB: authenticate with KeyB)

Key: Password, 6 bytes

Return:

0xBD	Len	0x02	Status	Checksum
------	-----	------	--------	----------

Status: 0x02: Login succeed

0x01: No tag

0x03: Login fail

0xF0: Checksum error

LOGIN TO A SECTOR

Private Sub Button4_Click

Send Command

{ File : login_sector_button.txt }

Check Return Command

Private Sub rfid1443a_login_sector

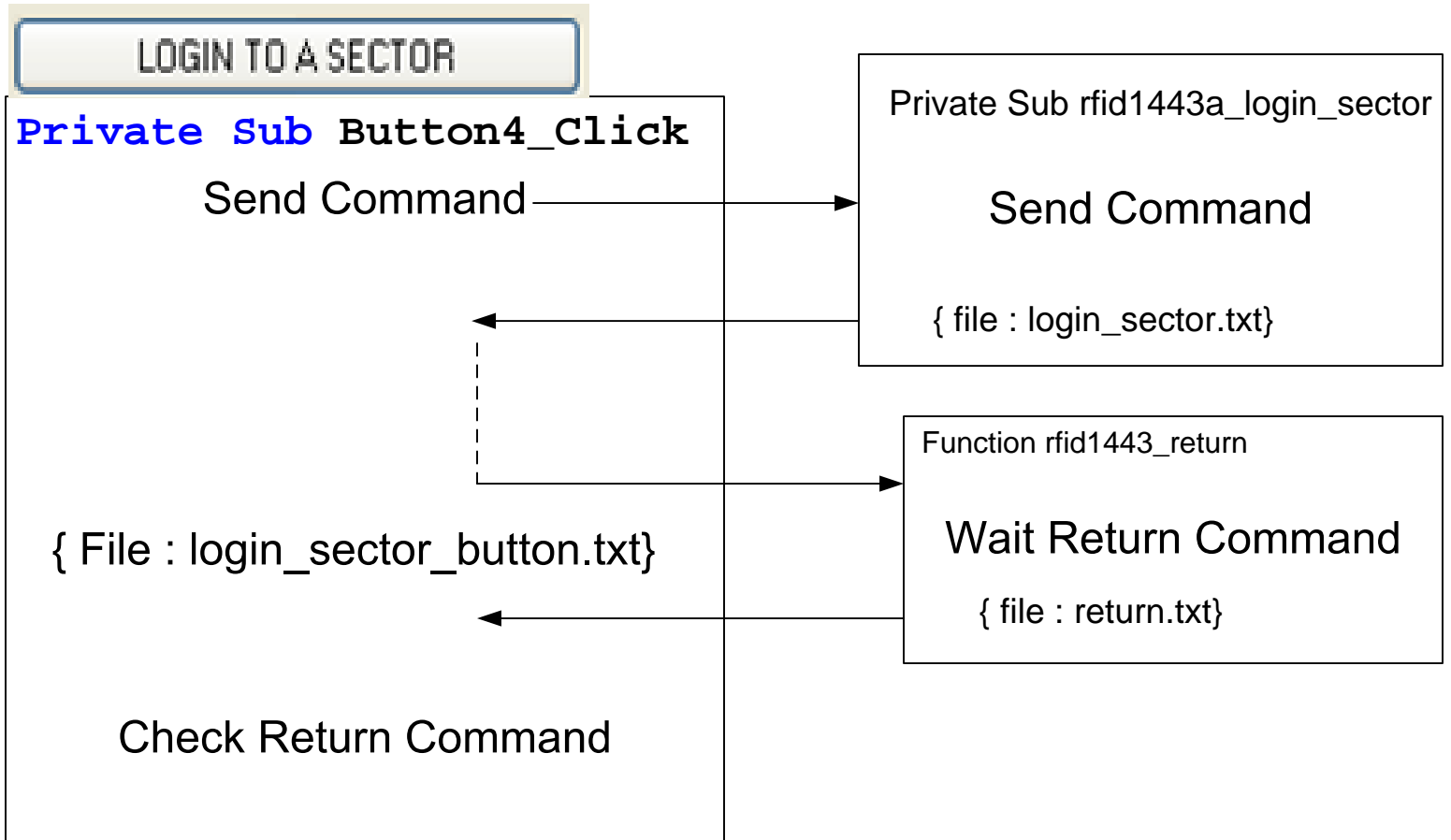
Send Command

{ file : login_sector.txt }

Function rfid1443_return

Wait Return Command

{ file : return.txt }





Private Sub Button4_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button4.Click

Form2.ShowDialog()

rfid1443a_login_sector(Val(Form2.txtsector.Text), Val(Form2.txtpassword1.Text), Val(Form2.txtpassword2.Text), Val(Form2.txtpassword3.Text), Val(Form2.txtpassword4.Text), Val(Form2.txtpassword5.Text), Val(Form2.txtpassword6.Text))

If rfid1443_return(&H2) = True Then
 ListBox1.Items.Add("Login to a sector success")
 Else
 ListBox1.Items.Add("Login to a sector error")
 Select Case rf1443a_return(3)

Case &H.... 'Return code No tag Error
 ListBox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code Login fail Error
 ListBox1.Items.Add(rfid1443a_return(3) & "Login fail")

Case &H.... 'Return code checksum Error
 ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")

End Select
 End If

4-4-2. Login to a sector

End Sub

0xBA	Len	0x02	Sector	Type	Key	Checksum
------	-----	------	--------	------	-----	----------

Sector: Sector need to login

Type: Key type (0xAA: authenticate with KeyA, 0xBB: authenticate with KeyB)

Key: Password, 6 bytes

Return:

0xBD	Len	0x02	Status	Checksum
------	-----	------	--------	----------

Status: 0x02: Login succeed

0x01: No tag

0x03: Login fail

0xF0: Checksum error

4-4-2. Login to a sector

0xBA	Len	0x02	Sector	Type	Key	Checksum
------	-----	------	--------	------	-----	----------

Sector: Sector need to login

Type: Key type (0xAA: authenticate with KeyA, 0xBB: authenticate with KeyB)

Key: Password, 6 bytes

Return:

0xBD	Len	0x02	Status	Checksum
------	-----	------	--------	----------

Status: 0x02: Login succeed

0x01: No tag

0x03: Login fail

0xF0: Checksum error

Private Sub rfid1443a_login_sector(ByVal sector As Byte, ByVal password1 As Byte, ByVal password2 As Byte, ByVal password3 As Byte, ByVal password4 As Byte, ByVal password5 As Byte, ByVal password6 As Byte)

rf1443a_cmd(0) = &H....

'Header

rf1443a_cmd(1) = &H....

'Len

rf1443a_cmd(2) = &H....

'Command

rf1443a_cmd(3) = sector

'Sector 0x00-0x0F

rf1443a_cmd(4) = &H....

'Key Type Key A or Key B

rf1443a_cmd(5) = password1

'Key Pass word Byte 1

rf1443a_cmd(6) = password2

'Key Pass word Byte 2

rf1443a_cmd(7) = password3

'Key Pass word Byte 3

rf1443a_cmd(8) = password4

'Key Pass word Byte 4

rf1443a_cmd(9) = password5

'Key Pass word Byte 5

rf1443a_cmd(10) = password6

'Key Pass word Byte 6

rf1443a_cmd(11) = rfid1443a_checksum(10) 'Check Sum

SerialPort1.Write(rfid1443a_cmd, 0, 12) 'Send Command

End Sub

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return

(ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte
Dim timeend As Date
timeend = Now.AddMilliseconds(2000)
Do
    Dim lenreturnbyte As Byte = 100
    Dim ret As Boolean
    Dim exitloop As Boolean
    index_return = 0
```

```
If SerialPort1.BytesToRead > 0 Then
```

```
rx_byte = SerialPort1.ReadByte
```

```
If index_return = 3 Then
```

```
Select Case rf1443cmd
```

```
Case &H1 'Select Mifare card
```

```
lenreturnbyte = .... ' Len return command
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

Case &H2 'Login to a sector

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H3 'Read a data block
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H4 'Write a data block
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H5 'Read a value block
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H6 'Write a value block
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H7 'Write master key (key A)
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H8 'Increment value
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &H9 'Decrement value
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
Case &HA 'Copy value
```

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
End Select
```

```
End If
```

```
rfid1443a_return(index_return) = rx_byte
```

```
index_return = index_return + 1
```

```
If index_return = lenreturnbyte Then exitloop = True
```

```
End If
```

```
If Now >= timeend Then
```

```
exitloop = True
```

```
End If
```

```
Loop While (exitloop <> True)
```

```
SerialPort1.DiscardInBuffer()
```

```
If index_return = lenreturnbyte Then
```

```
ret = True
```

```
End If
```

```
rfid1443_return = ret
```

```
End Function
```

4-4-2. Login to a sector

0xBA	Len	0x02	Sector	Type	Key	Checksum
------	-----	------	--------	------	-----	----------

Sector: Sector need to login

Type: Key type (0xAA: authenticate with KeyA, 0xBB: authenticate with KeyB)

Key: Password, 6 bytes

Return:

0xBD	Len	0x02	Status	Checksum
------	-----	------	--------	----------

Status: 0x02: Login succeed

0x01: No tag

0x03: Login fail

0xF0: Checksum error

Sector	Block	Byte Number within a Block																Description
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
15	3	Key A					Access Bits			Key B						Sector Trailer 15		
	2																	Data
	1																	Data
	0																	Data
14	3	Key A					Access Bits			Key B						Sector Trailer 14		
	2																	Data
	1																	Data
	0																	Data

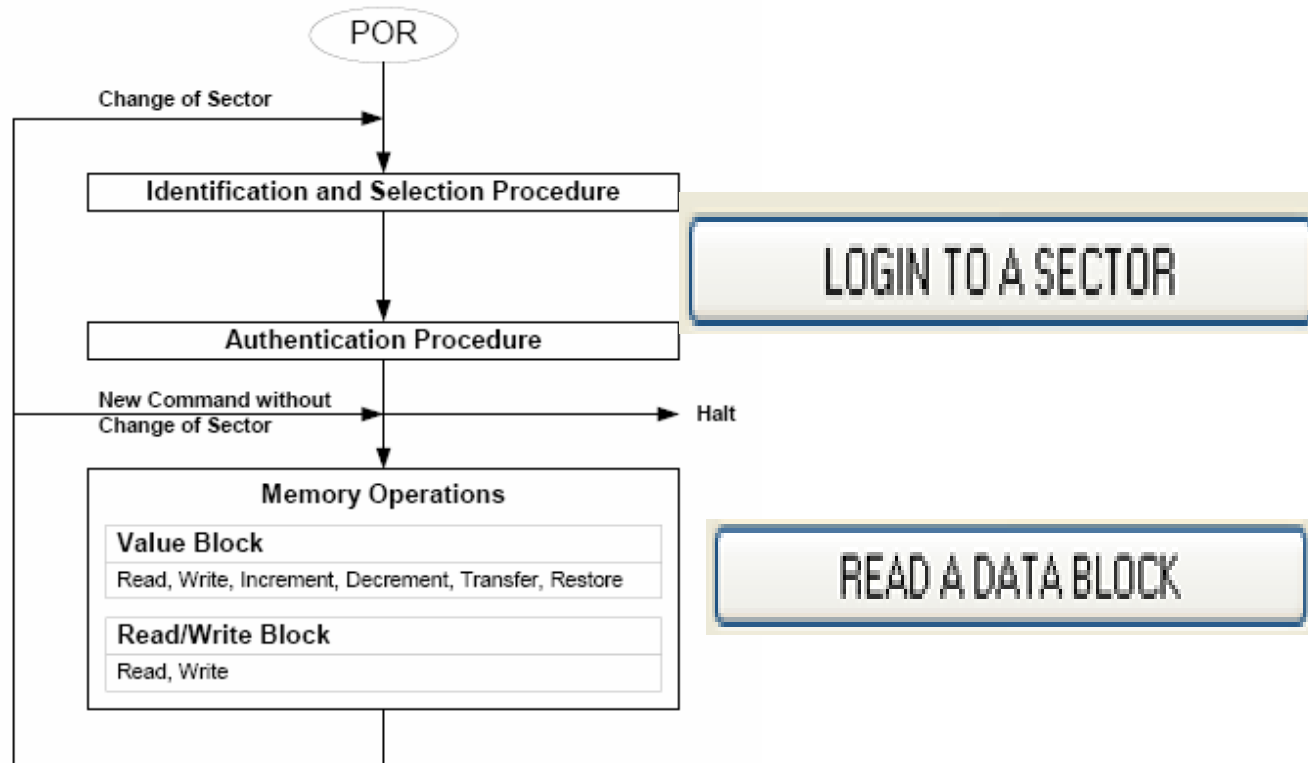


Fig 8. Memory access

4-4-3. Read a data block

0xBA	Len	0x03	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte

Return:

0xBD	Len	0x03	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data returned if operation succeeds, 16 bytes.

4-4-3. Read a data block

0xBA	Len	0x03	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte

Return:

0xBD	Len	0x03	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data returned if operation succeeds, 16 bytes.

READ A DATA BLOCK

Private Sub Button5_Click

Send Command

{ File : read_data_block_button.txt }

Check Return Command

Private Sub
rfid1443a_read_data_block

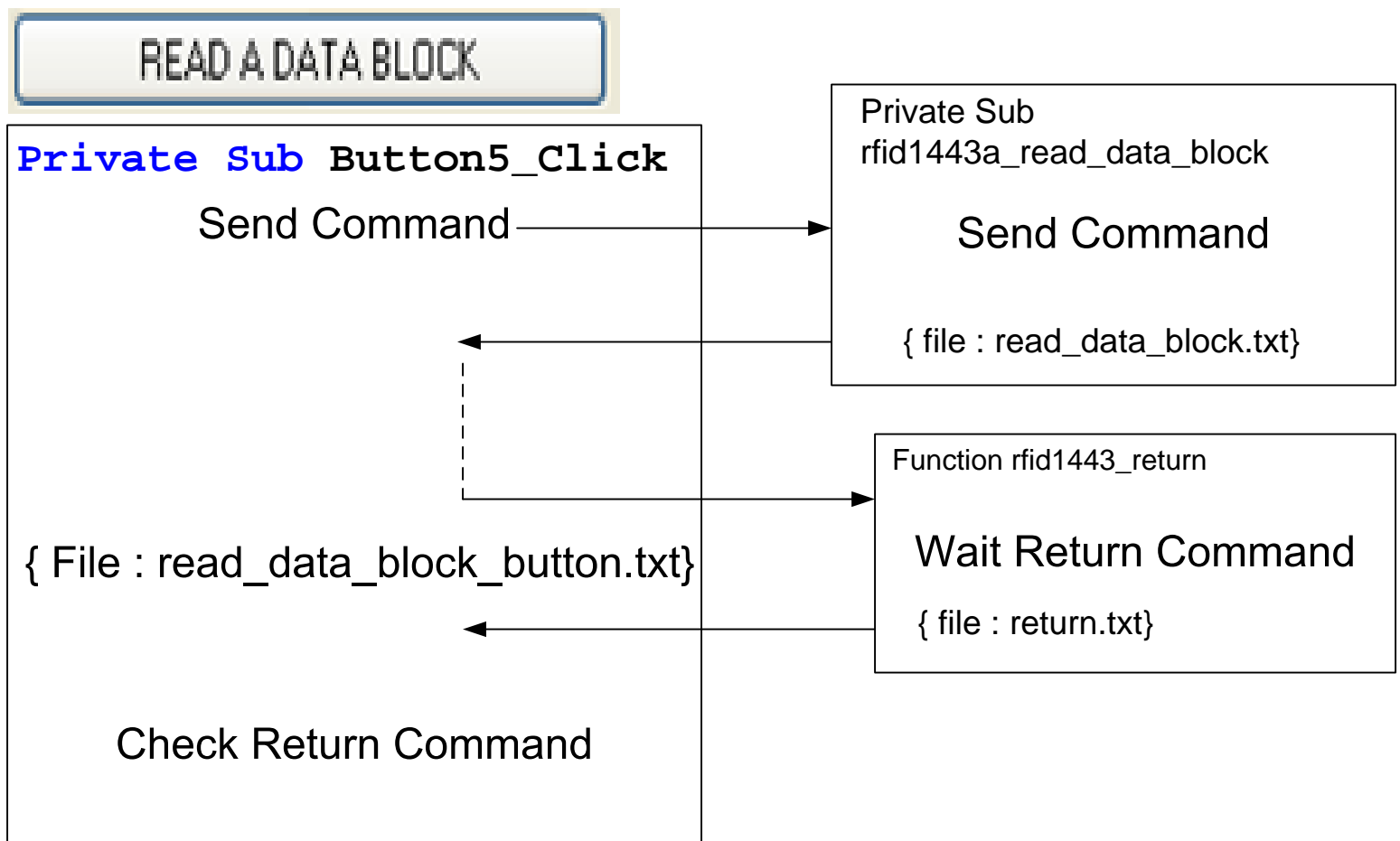
Send Command

{ file : read_data_block.txt }

Function rfid1443_return

Wait Return Command

{ file : return.txt }





Private Sub Button5_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button5.Click

Dim strinput As String

strinput = InputBox("INPUT BLOCK", "SELECT BLOCK")

rfid1443a_read_data_block(Val(strinput))

If rfid1443_return(&H3) = True Then

 ListBox1.Items.Add("Read a data block Success")

 tmpdisp_return = ""

 For ind_disp = 4 To 19

 tmpdisp_return = tmpdisp_return & Chr(rfid1443a_return(ind_disp))

 Next

 ListBox1.Items.Add("Data=" & tmpdisp_return)

Else

 ListBox1.Items.Add("Read a data block Error")

 If index_return > 0 Then

 Select Case rfid1443a_return(3)

Case &H.... 'Return code No tag Error

 ListBox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code Read fail Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Read fail")

Case &H.... 'Return code Not authenticate Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Not authenticate")

Case &H.... 'Return checksum Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")

 End Select

 End If

End If

4-4-3. Read a data block

0xBA	Len	0x03	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte

Return:

0xBD	Len	0x03	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

 0x01: No tag

 0x04: Read fail

 0x0D: Not authenticate

 0xF0: Checksum error

Data: Block data returned if operation succeeds, 16 bytes.

End Sub

4-4-3. Read a data block

0xBA	Len	0x03	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte

Return:

0xBD	Len	0x03	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data returned if operation succeeds, 16 bytes.

Private Sub rfid1443a_read_data_block(ByVal block As Byte)

rf1443a_cmd(0) = &H....

'Header

rf1443a_cmd(1) = &H....

'Len

rf1443a_cmd(2) = &H....

'Command

rf1443a_cmd(3) = block

'Block

rf1443a_cmd(4) = rfid1443a_checksum(3)

'Check Sum

SerialPort1.Write(rf1443a_cmd, 0, 5)

'Send Command

End Sub

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100      Dim exitloop As Boolean
Dim timeend As Date         Dim ret As Boolean                index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```

```
-----
If SerialPort1.BytesToRead > 0 Then
    rx_byte = SerialPort1.ReadByte
    If index_return = 3 Then
        Select Case rf1443cmd
            Case &H1 'Select Mifare card
                lenreturnbyte = .... ' Len return command
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
            Case &H2 'Login to a sector
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
```

Case &H3 'Read a data block

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = .... ' Len return command
```

```
Case &H4 'Write a data block
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H5 'Read a value block
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success€
    lenreturnbyte = .... ' Len return command
Case &H6 'Write a value block
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H7 'Write master key (key A)
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H8 'Increment value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H9 'Decrement value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &HA 'Copy value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
```

End Select

End If

```
rfid1443a_return(index_return) = rx_byte
```

```
index_return = index_return + 1
```

```
If index_return = lenreturnbyte Then exitloop = True
```

End If

```
If Now >= timeend Then
```

```
    exitloop = True
```

End If

```
Loop While (exitloop <> True)
```

```
SerialPort1.DiscardInBuffer()
```

```
If index_return = lenreturnbyte Then
```

```
    ret = True
```

End If

```
rfid1443_return = ret
```

End Function

4-4-3. Read a data block

0xBA	Len	0x03	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte

Return:

0xBD	Len	0x03	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data returned if operation succeeds, 16 bytes.

4-4-4. Write a data block

0xBA	Len	0x04	Block	Data	Checksum
------	-----	------	-------	------	----------

Block: The block number to be written, 1 byte.

Data: The data to write, 16 bytes.

Return:

0xBD	Len	0x04	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data written if operation succeeds, 16 bytes.

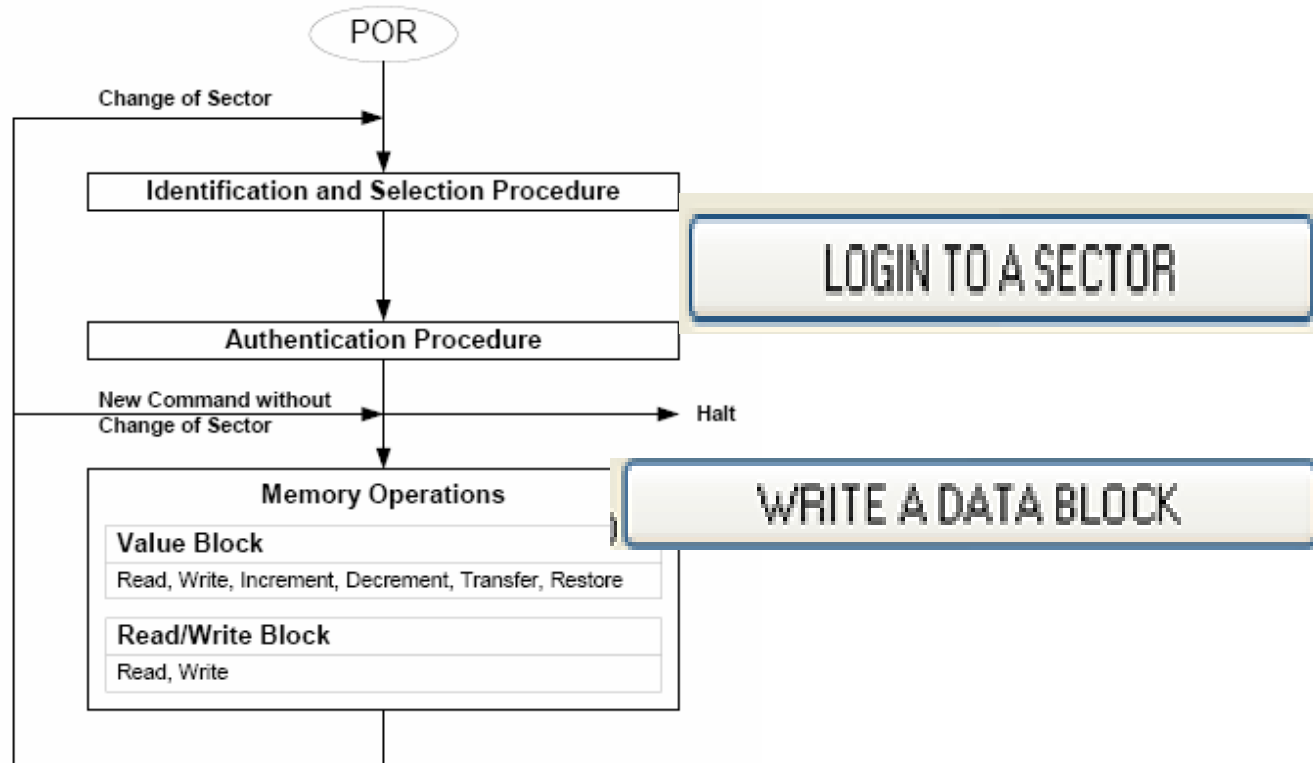


Fig 8. Memory access

4-4-4. Write a data block

54

0xBA	Len	0x04	Block	Data	Checksum
------	-----	------	-------	------	----------

Block: The block number to be written, 1 byte.

Data: The data to write, 16 bytes.

Return:

0xBD	Len	0x04	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data written if operation succeeds, 16 bytes.

WRITE A DATA BLOCK

Private Sub Button6_Click

Send Command

{ File : write_data_block_button.txt}

Check Return Command

Private Sub
rfid1443a_write_data_block

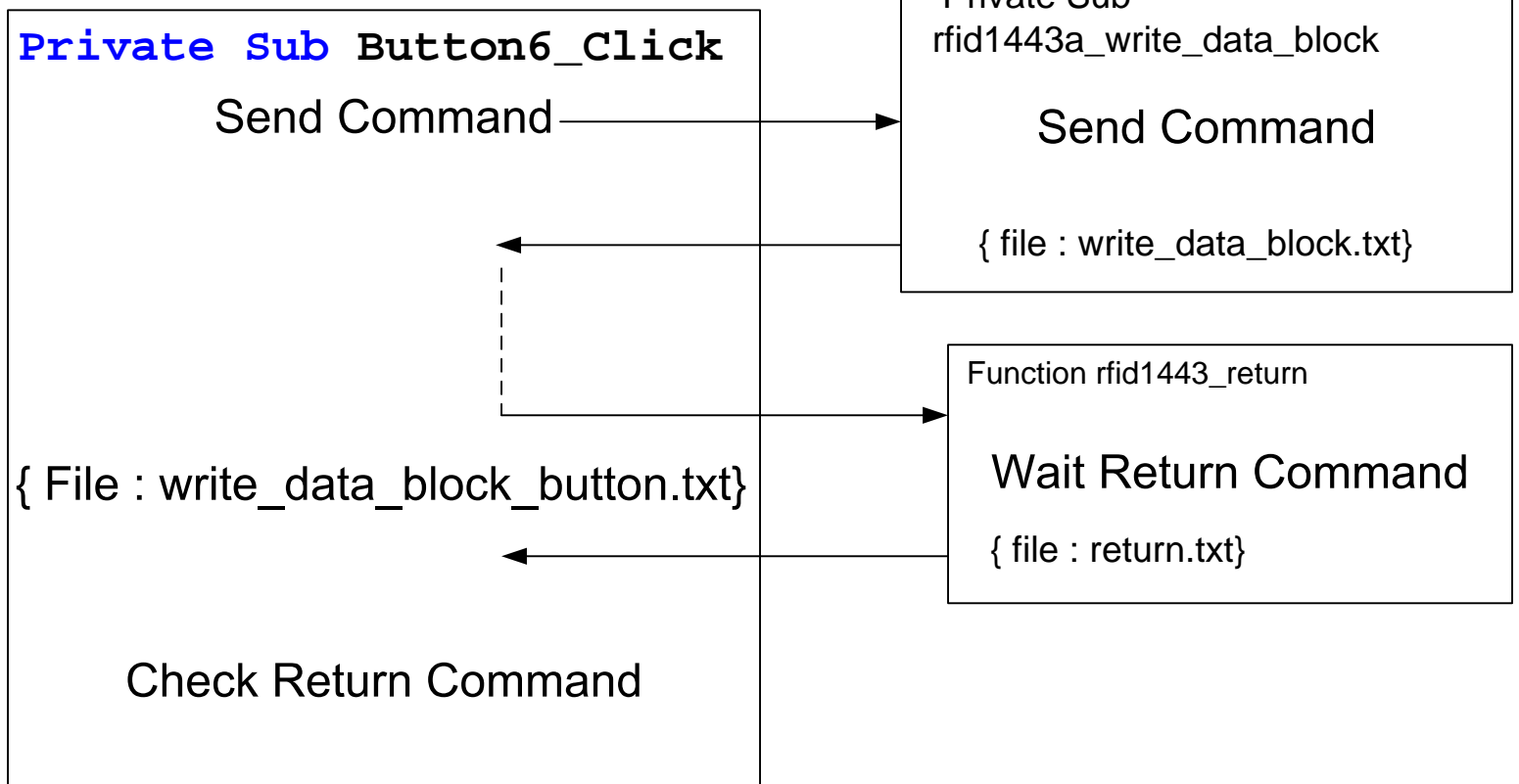
Send Command

{ file : write_data_block.txt}

Function rfid1443_return

Wait Return Command

{ file : return.txt}



Private Sub Button6_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button6.Click

Form3.ShowDialog()

rfid1443a_write_data_block(Val(Form3.txtblock.Text), Val(Form3.txtdata.Text))

If rfid1443_return(&H4) = True Then

ListBox1.Items.Add("Write a data block Success")

tmpdisp_return = ""

For ind_disp = 4 To 19

tmpdisp_return = tmpdisp_return & Chr(rfid1443a_return(ind_disp))

Next

ListBox1.Items.Add("Data=" & tmpdisp_return)

Else

ListBox1.Items.Add("Write a data block Error")

If index_return > 0 Then

Select Case rfid1443a_return(3)

Case &H.... 'Return code No tag Error

ListBox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code Write fail Error

ListBox1.Items.Add(rfid1443a_return(3) & "Write fail")

Case &H.... 'Return code Unable to read after write Error

ListBox1.Items.Add(rfid1443a_return(3) & "Unable to read after write")

Case &H.... 'Return code Not authenticate Error

ListBox1.Items.Add(rfid1443a_return(3) & "Not authenticate")

Case &H.... 'Return code Checksum Error

ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")

End Select

End If

End If

.....

 End Sub

4-4-4. Write a data block

0xBA	Len	0x04	Block	Data	Checksum
------	-----	------	-------	------	----------

Block: The block number to be written, 1 byte.

Data: The data to write, 16 bytes.

Return:

0xBD	Len	0x04	Status	Data	Checksum
------	-----	------	--------	------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0xF0: Checksum error

Data: Block data written if operation succeeds, 16 bytes.

4-4-4. Write a data block

0xBA	Len	0x04	Block	Data	Checksum
------	-----	------	-------	------	----------

Block: The block number to be written, 1 byte.

Data: The data to write, 16 bytes.

Return:

0xBD	Len	0x04	Status	Data	Checksum
------	-----	------	--------	------	----------

- Status: 0x00: Operation succeed
- 0x01: No tag
- 0x05: Write fail
- 0x06: Unable to read after write
- 0x0D: Not authenticate
- 0xF0: Checksum error

Data: Block data written if operation succeeds, 16 bytes.



Private Sub rfid1443a_write_data_block(ByVal block As Byte, ByVal data As String)

```

Dim z As Integer
If Len(data) < 16 Then           'Check Len data < 16
    For z = 1 To 16 - Len(data)  'Loop Add data " "
        data = data & " "
    Next
End If

```

```

rf1443a_cmd(0) = &H....           'Header
rf1443a_cmd(1) = &H....           'Len
rf1443a_cmd(2) = &H....           'Command
rf1443a_cmd(3) = block              'Block
rf1443a_cmd(4) = Asc(Mid(data, 1, 1)) 'Data Byte1
rf1443a_cmd(5) = Asc(Mid(data, 2, 1)) 'Data Byte2
rf1443a_cmd(6) = Asc(Mid(data, 3, 1)) 'Data Byte3
rf1443a_cmd(7) = Asc(Mid(data, 4, 1)) 'Data Byte4
rf1443a_cmd(8) = Asc(Mid(data, 5, 1)) 'Data Byte5
rf1443a_cmd(9) = Asc(Mid(data, 6, 1)) 'Data Byte6
rf1443a_cmd(10) = Asc(Mid(data, 7, 1)) 'Data Byte7
rf1443a_cmd(11) = Asc(Mid(data, 8, 1)) 'Data Byte8
rf1443a_cmd(12) = Asc(Mid(data, 9, 1)) 'Data Byte9
rf1443a_cmd(13) = Asc(Mid(data, 10, 1)) 'Data Byte10
rf1443a_cmd(14) = Asc(Mid(data, 11, 1)) 'Data Byte11
rf1443a_cmd(15) = Asc(Mid(data, 12, 1)) 'Data Byte12
rf1443a_cmd(16) = Asc(Mid(data, 13, 1)) 'Data Byte13
rf1443a_cmd(17) = Asc(Mid(data, 14, 1)) 'Data Byte14
rf1443a_cmd(18) = Asc(Mid(data, 15, 1)) 'Data Byte15
rf1443a_cmd(19) = Asc(Mid(data, 16, 1)) 'Data Byte16
rf1443a_cmd(20) = rfid1443a_checksum(19) 'Check Sum
SerialPort1.Write(rf1443a_cmd, 0, 21) 'Send Command
End Sub

```

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date          Dim ret As Boolean                      index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```

```
-----
If SerialPort1.BytesToRead > 0 Then
  rx_byte = SerialPort1.ReadByte
  If index_return = 3 Then
    Select Case rf1443cmd
      Case &H1 'Select Mifare card
        lenreturnbyte = ....          ' Len return command
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
      Case &H2 'Login to a sector
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
        lenreturnbyte = ....          ' Len return command
      Case &H3 'Read a data block
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
        lenreturnbyte = ....          ' Len return command
```

Case &H4 'Write a data block

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success

lenreturnbyte = ' Len return command

```
Case &H5 'Read a value block
  If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
  lenreturnbyte = ....          ' Len return command
Case &H6 'Write a value block
  If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
  lenreturnbyte = ....          ' Len return command
Case &H7 'Write master key (key A)
  If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
  lenreturnbyte = ....          ' Len return command
Case &H8 'Increment value
  If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
  lenreturnbyte = ....          ' Len return command
Case &H9 'Decrement value
  If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
  lenreturnbyte = ....          ' Len return command
Case &HA 'Copy value
  If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
  lenreturnbyte = ....          ' Len return command
```

End Select

End If

rfid1443a_return(index_return) = rx_byte

index_return = index_return + 1

If index_return = lenreturnbyte Then exitloop = True

End If

If Now >= timeend Then

exitloop = True

End If

```
Loop While (exitloop <> True) -----
```

SerialPort1.DiscardInBuffer()

If index_return = lenreturnbyte Then

ret = True

End If

rfid1443_return = ret

End Function

Byte Number	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Description	Value				Value				Value				Adr	$\overline{\text{Adr}}$	Adr	$\overline{\text{Adr}}$

Fig 6. Value blocks

4-4-6. Initialize a value block

0xBA	Len	0x06	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be initialized, 1 byte.

Value: The value to write, 4 bytes.

Return:

0xBD	Len	0x06	Status	Value	Checksum
------	-----	------	--------	-------	----------

- Status:
- 0x00: Operation succeed
 - 0x01: No tag
 - 0x05: Write fail
 - 0x06: Unable to read after write
 - 0x0D: Not authenticate
 - 0xF0: Checksum error

Value: Value written if the operation succeeds, 4 bytes.

WRITE A VALUE BLOCK

Private Sub Button7_Click

Send Command

{ File : write_value_block_button.txt }

Check Return Command

Private Sub
rfid1443a_write_value_block

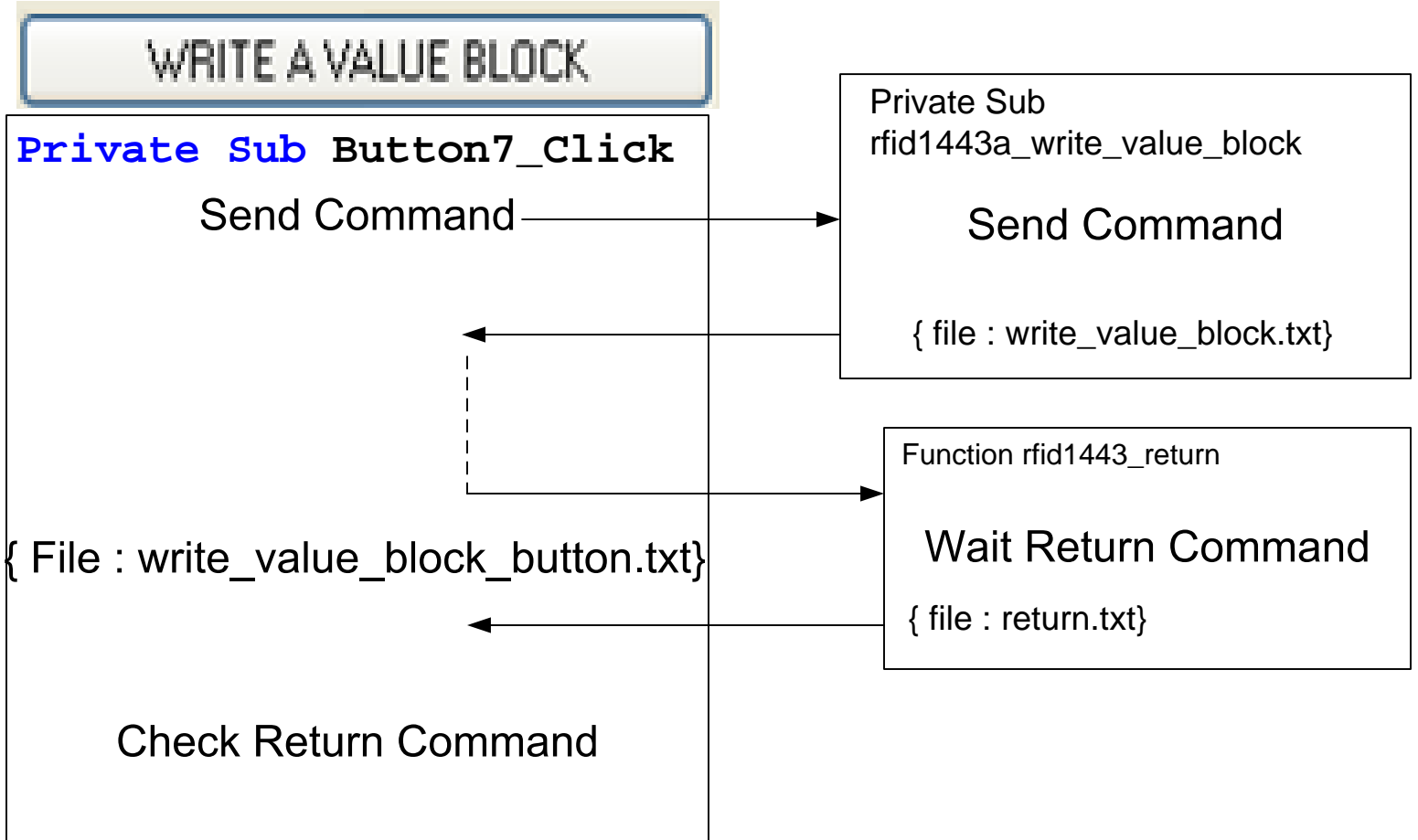
Send Command

{ file : write_value_block.txt }

Function rfid1443_return

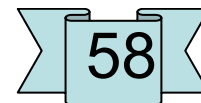
Wait Return Command

{ file : return.txt }



Button7.Click

```
Dim HextempLB, HextempHB, Hextemplate As String
Dim ValueLH, ValueLL, ValueHH, ValueHL As Integer
Dim money As Integer
Form4.ShowDialog()
```



rfid1443a_write_value_block(Val(Form4.txtblock.Text), Val(Form4.txtvalue.Text))

```
If rfid1443_return(&H6) = True Then
    ListBox1.Items.Add("Write a value block Success")
    tmpdisp_return = ""
    For ind_disp = 4 To 7
        tmpdisp_return = tmpdisp_return & Hex(rfid1443a_return(ind_disp)) & "-"
    Next
    ListBox1.Items.Add("Value=" & tmpdisp_return)
    HextempLB = Hex(rfid1443a_return(4))
    HextempHB = Hex(rfid1443a_return(5))
    If Len(HextempLB) = 1 Then
        HextempLB = "0" & HextempLB
    End If
    If Len(HextempHB) = 1 Then
        HextempHB = "0" & HextempHB
    End If
    Hextemplate = "0123456789ABCDEF"
    ValueLH = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1
    ValueLH = ValueLH * 16
    ValueLL = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1
    ValueHH = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1
    ValueHH = ValueHH * 16 ^ 3
    ValueHL = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1
    ValueHL = ValueHL * 16 ^ 2
    money = ValueHH + ValueHL + ValueLH + ValueLL
    ListBox1.Items.Add("Money=" & money)
Else
    ListBox1.Items.Add("Write a value block Error")
    If index_return > 0 Then
        Select Case rfid1443a_return(3)
            Case &H.... 'Return code No tag Error
                ListBox1.Items.Add(rfid1443a_return(3) & "No tag")
            Case &H.... 'Return code Write fail Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Write fail")
            Case &H.... 'Return code Unable to read after write Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Unable to read after write")
            Case &H.... 'Return code Not authenticate Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Not authenticate")
            Case &H.... 'Return code Checksum Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")
        End Select
    End If
End
```



4-4-6. Initialize a value block

0xBA	Len	0x06	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be initialized, 1 byte.

Value: The value to write, 4 bytes.

Return:

0xBD	Len	0x06	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0xF0: Checksum error

Value: Value written if the operation succeeds, 4 bytes.

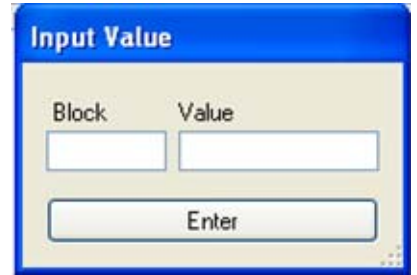
.....
End Sub

Private Sub rfid1443a_write_value_block(ByVal block As Byte, ByVal value As Integer)

```

Dim y As Integer
Dim value1, value2, H, L As Byte
Dim Hexnum, HextempHB, HextempLB, Hextemplate As String
Hexnum = Hex(value)
If Len(Hexnum) < 4 Then
    For y = 1 To 4 - Len(Hexnum)
        Hexnum = "0" & Hexnum
    Next y
End If
Hextemplate = "0123456789ABCDEF"
HextempHB = Mid(Hexnum, 1, 2)
H = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1
L = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1
value2 = (H * 16) + L
HextempLB = Mid(Hexnum, 3, 2)
H = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1
L = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1
value1 = (H * 16) + L

```



```

rf1443a_cmd(0) = &H....           'Header
rf1443a_cmd(1) = &H....           'Len
rf1443a_cmd(2) = &H....           'Command
rf1443a_cmd(3) = block              'Block
rf1443a_cmd(4) = value1              'value1
rf1443a_cmd(5) = value2              'value2
rf1443a_cmd(6) = &H0                 'value3
rf1443a_cmd(7) = &H0                 'value4
rf1443a_cmd(8) = rfid1443a_checksum(7) 'Check Sum
SerialPort1.Write(rf1443a_cmd, 0, 9) 'Send Command

```

End Sub

4-4-6. Initialize a value block

0xBA	Len	0x06	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be initialized, 1 byte.
 Value: The value to write, 4 bytes.

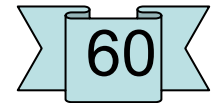
Return:

0xBD	Len	0x06	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed
 0x01: No tag
 0x05: Write fail
 0x06: Unable to read after write
 0x0D: Not authenticate
 0xF0: Checksum error

Value: Value written if the operation succeeds, 4 bytes.

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------



Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date          Dim ret As Boolean                      index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```

```
-----
If SerialPort1.BytesToRead > 0 Then
    rx_byte = SerialPort1.ReadByte
    If index_return = 3 Then
        Select Case rf1443cmd
            Case &H1 'Select Mifare card
                lenreturnbyte = .... ' Len return command
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
            Case &H2 'Login to a sector
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H3 'Read a data block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H4 'Write a data block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
```

Case &H5 'Read a value block

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success€
lenreturnbyte = .... ' Len return command
```

```
Case &H6 'Write a value block
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H7 'Write master key (key A)
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H8 'Increment value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H9 'Decrement value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &HA 'Copy value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
```

```
End Select
```

```
End If
```

```
rfid1443a_return(index_return) = rx_byte
```

```
index_return = index_return + 1
```

```
If index_return = lenreturnbyte Then exitloop = True
```

```
End If
```

```
If Now >= timeend Then
```

```
    exitloop = True
```

```
End If
```

```
Loop While (exitloop <> True) -----
```

```
SerialPort1.DiscardInBuffer()
```

```
If index_return = lenreturnbyte Then
```

```
    ret = True
```

```
End If
```

```
rfid1443_return = ret
```

```
End Function
```

4-4-6. Initialize a value block

0xBA	Len	0x06	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be initialized, 1 byte.

Value: The value to write, 4 bytes.

Return:

0xBD	Len	0x06	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0xF0: Checksum error

Value: Value written if the operation succeeds, 4 bytes.

4-4-5. Read a value block

61

0xBA	Len	0x05	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte.

Return:

0xBD	Len	0x05	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

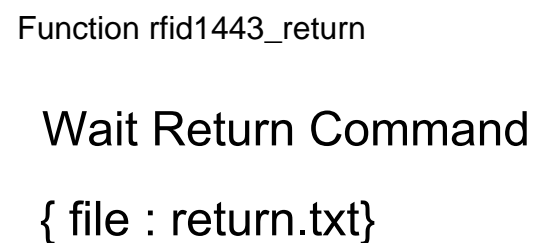
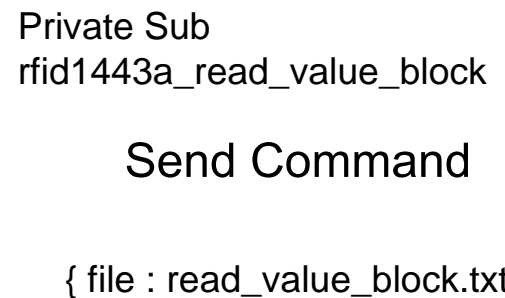
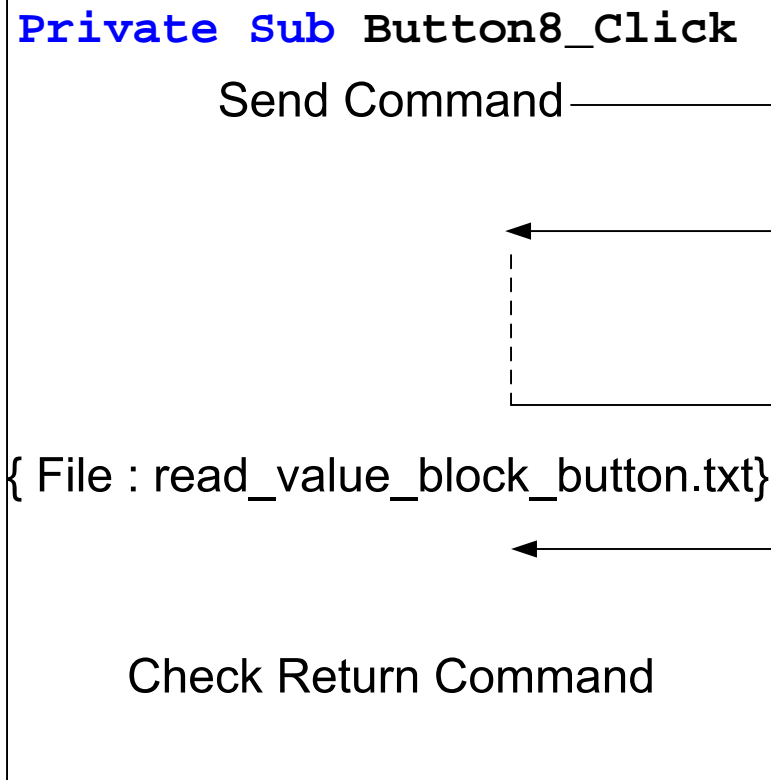
0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: Value returned if the operation succeeds, 4 bytes.

READ A VALUE BLOCK



Private Sub Button8_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)

Handles Button8.Click

```
strblock = InputBox("Input Block", "Read a value block")
```

```
rfid1443a_read_value_block(Val(strblock))
```

```
If rfid1443_return(&H5) = True Then
```

```
    ListBox1.Items.Add("Read a value block Success")
```

```
    tmpdisp_return = ""
```

```
    For ind_disp = 4 To 7
```

```
        tmpdisp_return = tmpdisp_return & Hex(rfid1443a_return(ind_disp)) & "-"
```

```
    Next
```

```
    ListBox1.Items.Add("Value=" & tmpdisp_return)
```

```
    HextempLB = Hex(rfid1443a_return(4))
```

```
    HextempHB = Hex(rfid1443a_return(5))
```

```
    If Len(HextempLB) = 1 Then
```

```
        HextempLB = "0" & HextempLB
```

```
    End If
```

```
    If Len(HextempHB) = 1 Then
```

```
        HextempHB = "0" & HextempHB
```

```
    End If
```

```
    Hextemplate = "0123456789ABCDEF"
```

```
    ValueLH = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1
```

```
    ValueLH = ValueLH * 16
```

```
    ValueLL = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1
```

```
    ValueHH = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1
```

```
    ValueHH = ValueHH * 16 ^ 3
```

```
    ValueHL = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1
```

```
    ValueHL = ValueHL * 16 ^ 2
```

```
    money = ValueHH + ValueHL + ValueLH + ValueLL
```

```
    ListBox1.Items.Add("Money=" & money)
```

```
Else
```

```
    ListBox1.Items.Add("Write a value block Error")
```

```
    If index_return > 0 Then
```

```
        Select Case rfid1443a_return(3)
```

```
            Case &H....      'Return code No tag Error
```

```
                ListBox1.Items.Add(rfid1443a_return(3) & "No tag")
```

```
            Case &H....      'Return code Read fail Error
```

```
                ListBox1.Items.Add(rfid1443a_return(3) & "Read fail")
```

```
            Case &H....      'Return code Not authenticate Error
```

```
                ListBox1.Items.Add(rfid1443a_return(3) & "Not authenticate")
```

```
            Case &H....      'Return code Not a value block Error
```

```
                ListBox1.Items.Add(rfid1443a_return(3) & "Not a value block")
```

```
            Case &H....      'Return code Checksum Error
```

```
                ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")
```

```
        End Select
```

```
    End If
```

```
End If
```

```
End Sub
```



62

4-4-5. Read a value block

0xBA	Len	0x05	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte.

Return:

0xBD	Len	0x05	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: Value returned if the operation succeeds, 4 bytes.

4-4-5. Read a value block

0xBA	Len	0x05	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte.

Return:

0xBD	Len	0x05	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: Value returned if the operation succeeds, 4 bytes.

Private Sub rfid1443a_read_value_block(ByVal block As Byte)

rfid1443a_cmd(0) = &H....

'Header

rfid1443a_cmd(1) = &H....

'Len

rfid1443a_cmd(2) = &H....

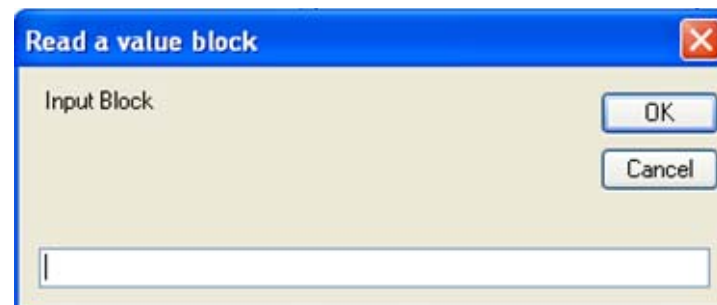
'Command

rfid1443a_cmd(3) = block 'Block

rfid1443a_cmd(4) = rfid1443a_checksum(3) 'Check Sum

SerialPort1.Write(rfid1443a_cmd, 0, 5) 'Send Command

End Sub



Reader to Host:

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date          Dim ret As Boolean                      index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```

```
-----
If SerialPort1.BytesToRead > 0 Then
  rx_byte = SerialPort1.ReadByte
  If index_return = 3 Then
    Select Case rf1443cmd
      Case &H1 'Select Mifare card
        lenreturnbyte = .... ' Len return command
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
      Case &H2 'Login to a sector
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
        lenreturnbyte = .... ' Len return command
      Case &H3 'Read a data block
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
        lenreturnbyte = .... ' Len return command
      Case &H4 'Write a data block
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
        lenreturnbyte = .... ' Len return command
      Case &H5 'Read a value block
        If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
        lenreturnbyte = .... ' Len return command
```



Case &H6 'Write a value block

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success

lenreturnbyte = ' Len return command

Case &H7 'Write master key (key A)

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H8 'Increment value

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &H9 'Decrement value

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

Case &HA 'Copy value

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = ' Len return command

End Select

End If

rfid1443a_return(index_return) = rx_byte

index_return = index_return + 1

If index_return = lenreturnbyte Then exitloop = True

End If

If Now >= timeend Then
exitloop = True

End If

Loop While (exitloop <> True) -----

SerialPort1.DiscardInBuffer()

If index_return = lenreturnbyte Then
ret = True

End If

rfid1443_return = ret

End Function

4-4-5. Read a value block

0xBA	Len	0x05	Block	Checksum
------	-----	------	-------	----------

Block: The block number to be read, 1 byte.

Return:

0xBD	Len	0x05	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x04: Read fail

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: Value returned if the operation succeeds, 4 bytes.

4-4-8. Increment value

0xBA	Len	0x08	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be increased, 1 byte.

Value: The value to be increased by, 4 bytes.

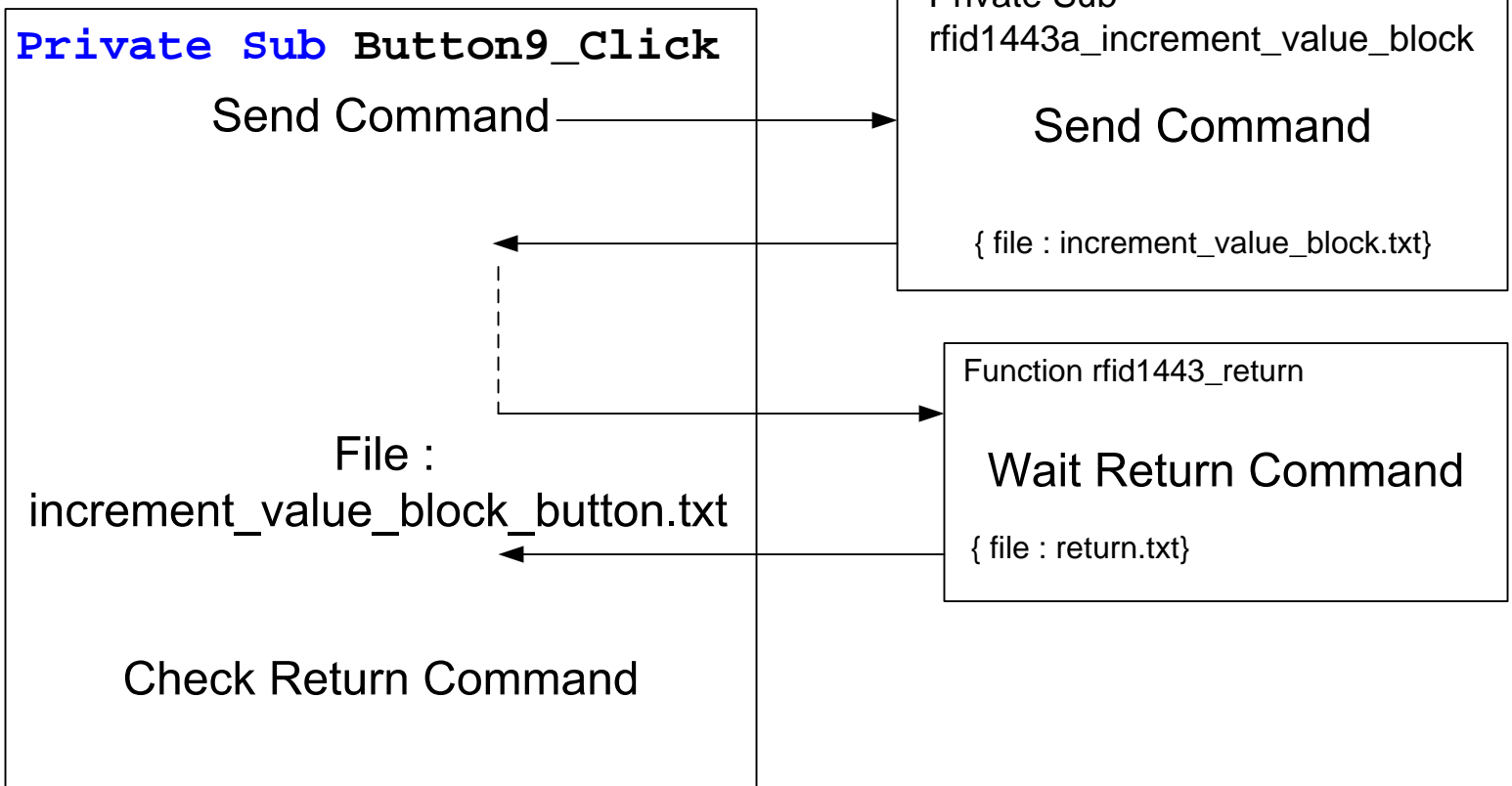
Return:

0xBD	Len	0x08	Status	Value	Checksum
------	-----	------	--------	-------	----------

- Status: 0x00: Operation succeed
- 0x01: No tag
- 0x05: Write fail
- 0x06: Unable to read after write
- 0x0D: Not authenticate
- 0x0E: Not a value block
- 0xF0: Checksum error

Value: The value after increment if the operation succeeds, 4 bytes

INCREMENT VALUE



Private Sub Button9_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)

Handles Button9.Click

Form4.ShowDialog()

rfid1443a_increment_value_block(Val(Form4.txtblock.Text), Val(Form4.txtvalue.Text))

If rfid1443_return(&H8) = True Then

Listbox1.Items.Add("Increment value Success")

tmpdisp_return = ""

For ind_disp = 4 To 7

tmpdisp_return = tmpdisp_return & Hex(rfid1443a_return(ind_disp)) & "-"

Next

Listbox1.Items.Add("Value=" & tmpdisp_return)

HextempLB = Hex(rfid1443a_return(4))

HextempHB = Hex(rfid1443a_return(5))

If Len(HextempLB) = 1 Then

HextempLB = "0" & HextempLB

End If

If Len(HextempHB) = 1 Then

HextempHB = "0" & HextempHB

End If

Hextemplate = "0123456789ABCDEF"

ValueLH = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1

ValueLH = ValueLH * 16

ValueLL = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1

ValueHH = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1

ValueHH = ValueHH * 16 ^ 3

ValueHL = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1

ValueHL = ValueHL * 16 ^ 2

money = ValueHH + ValueHL + ValueLH + ValueLL

Listbox1.Items.Add("Money=" & money)

Else

Listbox1.Items.Add("Increment value Error")

If index_return > 0 Then

Select Case rfid1443a_return(3)

Case &H.... 'Return code No tag Error

Listbox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code Read fail Error

Listbox1.Items.Add(rfid1443a_return(3) & "Read fail")

Case &H.... 'Return code Not authenticate Error

Listbox1.Items.Add(rfid1443a_return(3) & "Not authenticate")

Case &H.... 'Return code Not a value block Error

Listbox1.Items.Add(rfid1443a_return(3) & "Not a value block")

Case &H.... 'Return code checksum Error

Listbox1.Items.Add(rfid1443a_return(3) & "Checksum error")

End Select

End If

End If



4-4-8. Increment value

0xBA	Len	0x08	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be increased, 1 byte.

Value: The value to be increased by, 4 bytes.

Return:

0xBD	Len	0x08	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: The value after increment if the operation succeeds, 4 bytes

End Sub

4-4-8. Increment value

0xBA	Len	0x08	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be increased, 1 byte.

Value: The value to be increased by, 4 bytes.

Return:

0xBD	Len	0x08	Status	Value	Checksum
------	-----	------	--------	-------	----------

- Status: 0x00: Operation succeed
- 0x01: No tag
- 0x05: Write fail
- 0x06: Unable to read after write
- 0x0D: Not authenticate
- 0x0E: Not a value block
- 0xF0: Checksum error

Value: The value after increment if the operation succeeds, 4 bytes

Private Sub rfid1443a_increment_value_block(ByVal block As Byte, ByVal value As Integer)

```

.....
Hexnum = Hex(value)
If Len(Hexnum) < 4 Then
    For y = 1 To 4 - Len(Hexnum)
        Hexnum = "0" & Hexnum
    Next y
End If
Hextemplate = "0123456789ABCDEF"
HextempHB = Mid(Hexnum, 1, 2)
H = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1
L = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1
value2 = (H * 16) + L
HextempLB = Mid(Hexnum, 3, 2)
H = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1
L = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1
value1 = (H * 16) + L
    rfid1443a_cmd(0) = &H....           'Header
    rfid1443a_cmd(1) = &H....           'Len
    rfid1443a_cmd(2) = &H....           'Command
    rfid1443a_cmd(3) = block             'Block
    rfid1443a_cmd(4) = value1            'value1
    rfid1443a_cmd(5) = value2            'value2
    rfid1443a_cmd(6) = &H0               'value3
    rfid1443a_cmd(7) = &H0               'value4
    rfid1443a_cmd(8) = rfid1443a_checksum(7) 'Check Sum
    SerialPort1.Write(rfid1443a_cmd, 0, 9) 'Send Command
End Sub

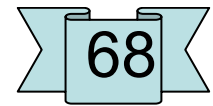
```



Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date          Dim ret As Boolean                      index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```



```
Do
    If SerialPort1.BytesToRead > 0 Then
        rx_byte = SerialPort1.ReadByte
        If index_return = 3 Then
            Select Case rf1443cmd
                Case &H1 'Select Mifare card
                    lenreturnbyte = .... ' Len return command
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                Case &H2 'Login to a sector
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H3 'Read a data block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H4 'Write a data block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H5 'Read a value block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H6 'Write a value block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H7 'Write master key (key A)
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
```

Case &H8 'Increment value

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = .... ' Len return command
```

```
Case &H9 'Decrement value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &HA 'Copy value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
```

```
End Select
End If
rfid1443a_return(index_return) = rx_byte
index_return = index_return + 1
If index_return = lenreturnbyte Then exitloop = True
End If
If Now >= timeend Then
    exitloop = True
End If
Loop While (exitloop <> True)
SerialPort1.DiscardInBuffer()
If index_return = lenreturnbyte Then
    ret = True
End If
rfid1443_return = ret
End Function
```

4-4-8. Increment value

0xBA	Len	0x08	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be increased, 1 byte.
 Value: The value to be increased by, 4 bytes.

Return:

0xBD	Len	0x08	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed
 0x01: No tag
 0x05: Write fail
 0x06: Unable to read after write
 0x0D: Not authenticate
 0x0E: Not a value block
 0xF0: Checksum error

Value: The value after increment if the operation succeeds, 4 bytes

4-4-9. Decrement value

0xBA	Len	0x09	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be decreased, 1 byte

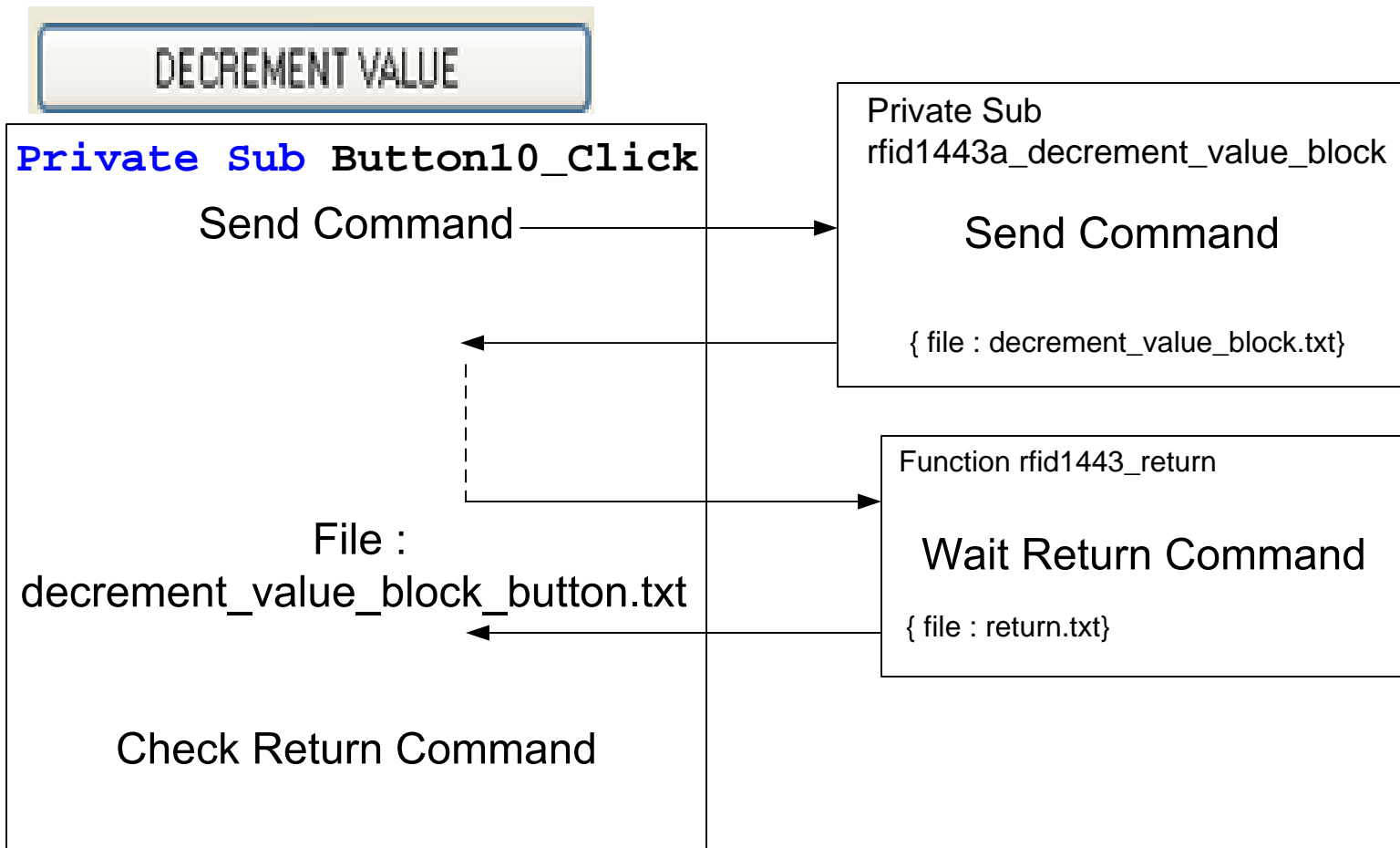
Value: The value to be decreased by, 4 bytes

Return:

0xBD	Len	0x09	Status	Value	Checksum
------	-----	------	--------	-------	----------

- Status: 0x00: Operation succeed
- 0x01: No tag
- 0x05: Write fail
- 0x06: Unable to read after write
- 0x0D: Not authenticate
- 0x0E: Not a value block
- 0xF0: Checksum error

Value: The value after decrement if the operation succeeds, 4 bytes



Private Sub Button10_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)

Handles Button10.Click

Form4.ShowDialog()

rfid1443a_decrement_value_block(Val(Form4.txtblock.Text), Val

If rfid1443_return(&H9) = True Then

Listbox1.Items.Add("Decrement value Success")

tmpdisp_return = ""

For ind_disp = 4 To 7

tmpdisp_return = tmpdisp_return & Hex(rfid1443a_return(ind_disp)) & "-"

Next

Listbox1.Items.Add("Value=" & tmpdisp_return)

HextempLB = Hex(rfid1443a_return(4))

HextempHB = Hex(rfid1443a_return(5))

If Len(HextempLB) = 1 Then

HextempLB = "0" & HextempLB

End If

If Len(HextempHB) = 1 Then

HextempHB = "0" & HextempHB

End If

Hextemplate = "0123456789ABCDEF"

ValueLH = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1

ValueLH = ValueLH * 16

ValueLL = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1

ValueHH = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1

ValueHH = ValueHH * 16 ^ 3

ValueHL = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1

ValueHL = ValueHL * 16 ^ 2

money = ValueHH + ValueHL + ValueLH + ValueLL

Listbox1.Items.Add("Money=" & money)

Else

Listbox1.Items.Add("Decrement value Error")

If index_return > 0 Then

Select Case rfid1443a_return(3)

Case &H.... 'Return code No tag Error

Listbox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code Read fail Error

Listbox1.Items.Add(rfid1443a_return(3) & "Read fail")

Case &H.... 'Return code Not authenticate Error

Listbox1.Items.Add(rfid1443a_return(3) & "Not authenticate")

Case &H.... 'Return code Not a value block Error

Listbox1.Items.Add(rfid1443a_return(3) & "Not a value block")

Case &H.... 'Return code checksum Error

Listbox1.Items.Add(rfid1443a_return(3) & "Checksum error")

End Select

End If

End If

End Sub

The screenshot shows a dialog box with a blue title bar that says "Input Value". Inside the dialog, there are two text input fields. The first field is labeled "Block" and the second is labeled "Value". Below these fields is a button labeled "Enter".



4-4-9. Decrement value

0xBA	Len	0x09	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be decreased, 1 byte

Value: The value to be decreased by, 4 bytes

Return:

0xBD	Len	0x09	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: The value after decrement if the operation succeeds, 4 bytes

4-4-9. Decrement value

0xBA	Len	0x09	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be decreased, 1 byte

Value: The value to be decreased by, 4 bytes

Return:

0xBD	Len	0x09	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: The value after decrement if the operation succeeds, 4 bytes

The image shows a dialog box titled "Input Value". It has two input fields: "Block" and "Value". Below these fields is a button labeled "Enter".

Private Sub rfid1443a_decrement_value_block(ByVal block As Byte, ByVal value As Integer)

Dim y As Integer

Dim value1, value2, H, L As Byte

Dim Hexnum, HextempHB, HextempLB, Hextemplate As String

Hexnum = Hex(value)

If Len(Hexnum) < 4 Then

For y = 1 To 4 - Len(Hexnum)

Hexnum = "0" & Hexnum

Next y

End If

Hextemplate = "0123456789ABCDEF"

HextempHB = Mid(Hexnum, 1, 2)

H = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1

L = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1

value2 = (H * 16) + L

HextempLB = Mid(Hexnum, 3, 2)

H = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1

L = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1

value1 = (H * 16) + L

rfid1443a_cmd(0) = &H.... 'Header

rfid1443a_cmd(1) = &H.... 'Len=

rfid1443a_cmd(2) = &H.... 'Command=

rfid1443a_cmd(3) = block 'Block

rfid1443a_cmd(4) = value1 'value1

rfid1443a_cmd(5) = value2 'value2

rfid1443a_cmd(6) = &H0 'value3

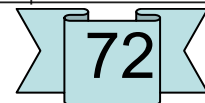
rfid1443a_cmd(7) = &H0 'value4

rfid1443a_cmd(8) = rfid1443a_checksum(7) 'Check Sum

SerialPort1.Write(rfid1443a_cmd, 0, 9) 'Send Command

End Sub

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------



Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date          Dim ret As Boolean                      index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```

```
    If SerialPort1.BytesToRead > 0 Then
        rx_byte = SerialPort1.ReadByte
        If index_return = 3 Then
            Select Case rf1443cmd
                Case &H1 'Select Mifare card
                    lenreturnbyte = .... ' Len return command
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                Case &H2 'Login to a sector
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H3 'Read a data block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H4 'Write a data block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H5 'Read a value block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H6 'Write a value block
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H7 'Write master key (key A)
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
                Case &H8 'Increment value
                    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                    lenreturnbyte = .... ' Len return command
```

Case &H9 'Decrement value

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
lenreturnbyte = .... ' Len return command
```

```
Case &HA 'Copy value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
```

End Select

End If

```
rfid1443a_return(index_return) = rx_byte
```

```
index_return = index_return + 1
```

```
If index_return = lenreturnbyte Then exitloop = True
```

End If

```
If Now >= timeend Then
```

```
    exitloop = True
```

End If

```
Loop While (exitloop <> True)
```

```
SerialPort1.DiscardInBuffer()
```

```
If index_return = lenreturnbyte Then
```

```
    ret = True
```

End If

```
rfid1443_return = ret
```

End Function

4-4-9. Decrement value

0xBA	Len	0x09	Block	Value	Checksum
------	-----	------	-------	-------	----------

Block: The block number to be decreased, 1 byte

Value: The value to be decreased by, 4 bytes

Return:

0xBD	Len	0x09	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block

0xF0: Checksum error

Value: The value after decrement if the operation succeeds, 4 bytes

4-4-10. Copy value

0xBA	Len	0x0A	Source	Destination	Checksum
------	-----	------	--------	-------------	----------

Source: The source block copy from, 1 byte

Destination: The destination copy to, 1 byte

The source and destination must in the same sector

Return:

0xBD	Len	0x0A	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

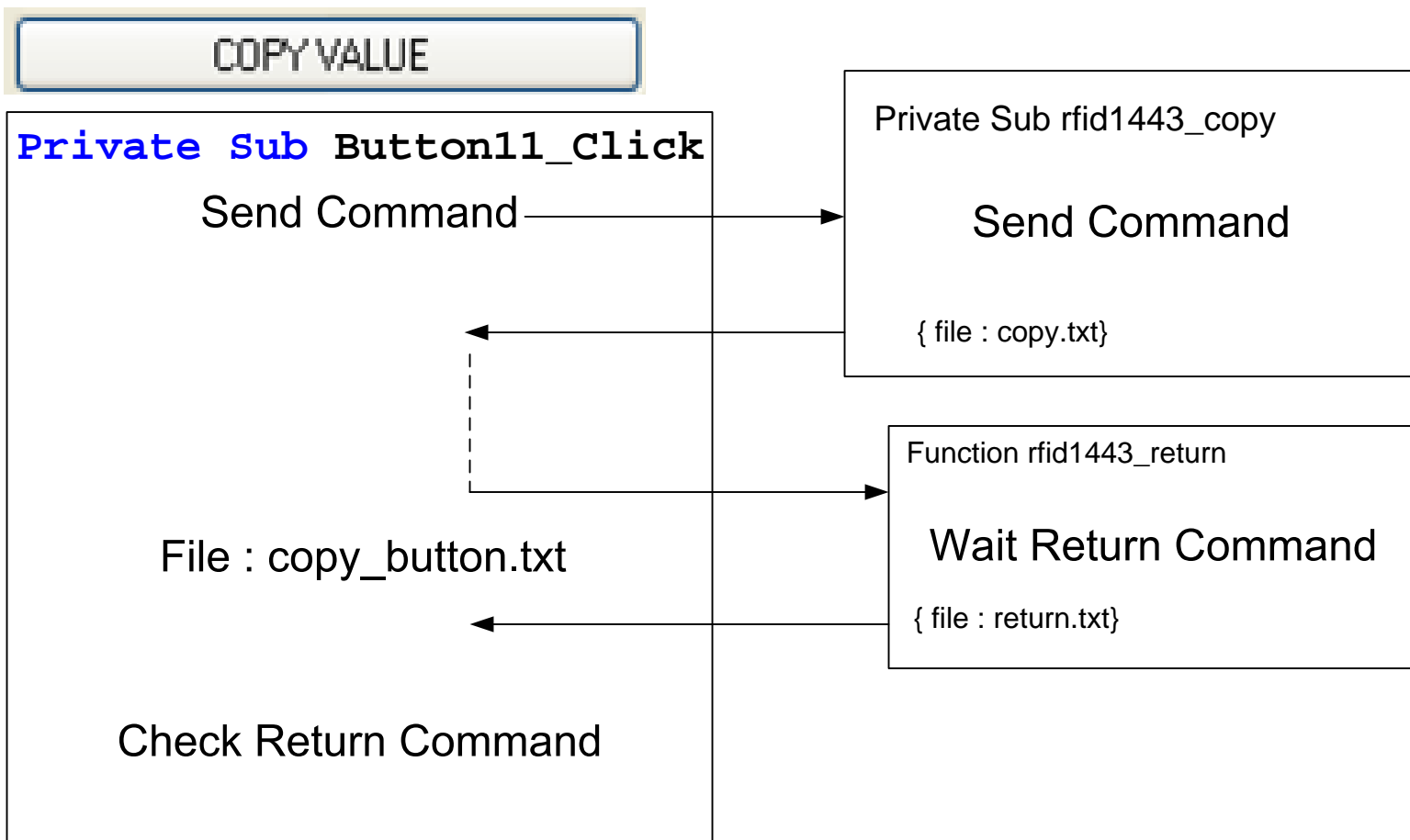
0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block (Source)

0xF0: Checksum error

Value: The value after copy if the operation succeeds, 4 bytes

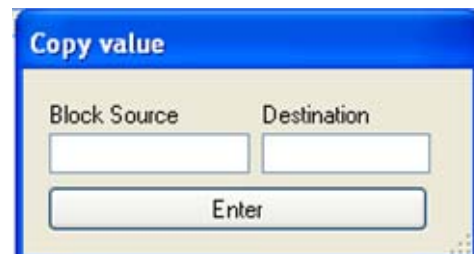


.....
rfid1443_copy(Val(Form5.txtblock_source.Text), Val(Form5.txtblock_destination.Text))

```

If rfid1443_return(&HA) = True Then
    ListBox1.Items.Add("Copy value Success")
    tmpdisp_return = ""
    For ind_disp = 4 To 7
        tmpdisp_return = tmpdisp_return & Hex(rfid1443a_return(ind_disp)) & "-"
    Next
    ListBox1.Items.Add("Value=" & tmpdisp_return)
    HextempLB = Hex(rfid1443a_return(4))
    HextempHB = Hex(rfid1443a_return(5))
    If Len(HextempLB) = 1 Then
        HextempLB = "0" & HextempLB
    End If
    If Len(HextempHB) = 1 Then
        HextempHB = "0" & HextempHB
    End If
    Hextemplate = "0123456789ABCDEF"
    ValueLH = InStr(1, Hextemplate, Mid(HextempLB, 1, 1)) - 1
    ValueLH = ValueLH * 16
    ValueLL = InStr(1, Hextemplate, Mid(HextempLB, 2, 1)) - 1
    ValueHH = InStr(1, Hextemplate, Mid(HextempHB, 1, 1)) - 1
    ValueHH = ValueHH * 16 ^ 3
    ValueHL = InStr(1, Hextemplate, Mid(HextempHB, 2, 1)) - 1
    ValueHL = ValueHL * 16 ^ 2
    money = ValueHH + ValueHL + ValueLH + ValueLL
    ListBox1.Items.Add("Money=" & money)
Else
    ListBox1.Items.Add("Copy value Error")
    If index_return > 0 Then
        Select Case rfid1443a_return(3)
            Case &H.... 'Return code No tag Error
                ListBox1.Items.Add(rfid1443a_return(3) & "No tag")
            Case &H.... 'Return code Read fail Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Read fail")
            Case &H.... 'Return code Not Authenticate Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Not authenticate")
            Case &H.... 'Return code Not a value block Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Not a value block")
            Case &H.... 'Return code Checksum Error
                ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")
        End Select
    End If
End If

```



4-4-10. Copy value

0xBA	Len	0x0A	Source	Destination	Checksum
------	-----	------	--------	-------------	----------

Source: The source block copy from, 1 byte
 Destination: The destination copy to, 1 byte
 The source and destination must in the same sector

Return:

0xBD	Len	0x0A	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed
 0x01: No tag
 0x05: Write fail
 0x06: Unable to read after write
 0x0D: Not authenticate
 0x0E: Not a value block (Source)
 0xF0: Checksum error
 Value: The value after copy if the operation succeeds, 4 bytes

4-4-10. Copy value

0xBA	Len	0x0A	Source	Destination	Checksum
------	-----	------	--------	-------------	----------

Source: The source block copy from, 1 byte

Destination: The destination copy to, 1 byte

The source and destination must in the same sector

Return:

0xBD	Len	0x0A	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

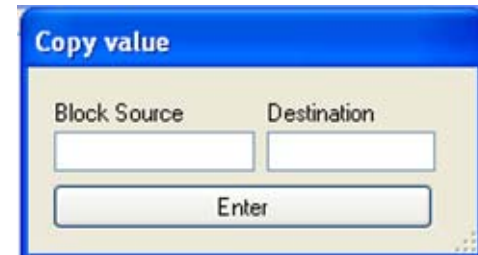
0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block (Source)

0xF0: Checksum error

Value: The value after copy if the operation succeeds, 4 bytes



Private Sub rfid1443_copy(ByVal source As Byte, ByVal destination As Byte)

rfid1443a_cmd(0) = &H....

'Header

rfid1443a_cmd(1) = &H....

'Len

rfid1443a_cmd(2) = &H....

'Command

rfid1443a_cmd(3) = source

'Source

rfid1443a_cmd(4) = destination

'Destination

rfid1443a_cmd(5) = rfid1443a_checksum(4)

'Check Sum

SerialPort1.Write(rfid1443a_cmd, 0, 6)

'Send Command

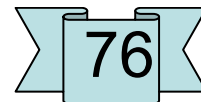
End Sub

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------

Function rfid1443_return (ByVal rf1443cmd As Byte) As Boolean

```
Dim rx_byte As Byte          Dim lenreturnbyte As Byte = 100          Dim exitloop As Boolean
Dim timeend As Date          Dim ret As Boolean                      index_return = 0
timeend = Now.AddMilliseconds(2000)
Do
```

```
-----
If SerialPort1.BytesToRead > 0 Then
    rx_byte = SerialPort1.ReadByte
    If index_return = 3 Then
        Select Case rf1443cmd
            Case &H1 'Select Mifare card
                lenreturnbyte = .... ' Len return command
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
            Case &H2 'Login to a sector
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H3 'Read a data block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H4 'Write a data block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H5 'Read a value block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H6 'Write a value block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H7 'Write master key (key A)
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H8 'Increment value
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H9 'Decrement value
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
```



Case &HA 'Copy value

```
If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
```

```
lenreturnbyte = .... ' Len return command
```

```
End Select
```

```
End If
```

```
rfid1443a_return(index_return) = rx_byte
```

```
index_return = index_return + 1
```

```
If index_return = lenreturnbyte Then exitloop = True
```

```
End If
```

```
If Now >= timeend Then
```

```
    exitloop = True
```

```
End If
```

```
Loop While (exitloop <> True)
```

```
SerialPort1.DiscardInBuffer()
```

```
If index_return = lenreturnbyte Then
```

```
    ret = True
```

```
End If
```

```
rfid1443_return = ret
```

```
End Function
```

4-4-10. Copy value

0xBA	Len	0x0A	Source	Destination	Checksum
------	-----	------	--------	-------------	----------

Source: The source block copy from, 1 byte

Destination: The destination copy to, 1 byte

The source and destination must in the same sector

Return:

0xBD	Len	0x0A	Status	Value	Checksum
------	-----	------	--------	-------	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x06: Unable to read after write

0x0D: Not authenticate

0x0E: Not a value block (Source)

0xF0: Checksum error

Value: The value after copy if the operation succeeds, 4 bytes

4-4-7. Write master key (key A)

0xBA	Len	0x07	Sector	Key	Checksum
------	-----	------	--------	-----	----------

Sector: The sector number to be written, 1 byte.

Key: Authentication key, 6 bytes

Return:

0xBD	Len	0x07	Status	Key	Checksum
------	-----	------	--------	-----	----------

Status: 0x00: Operation succeed

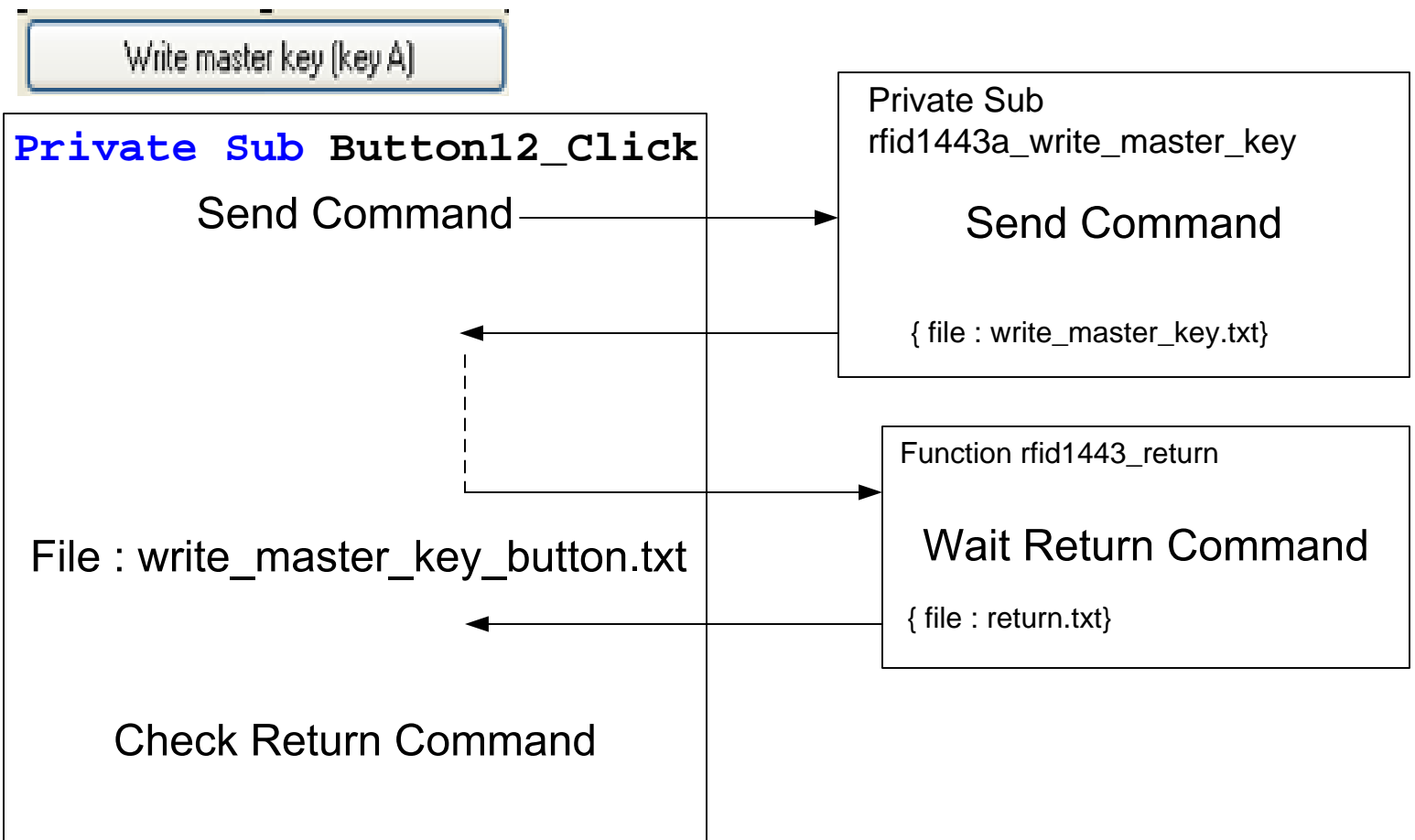
0x01: No tag

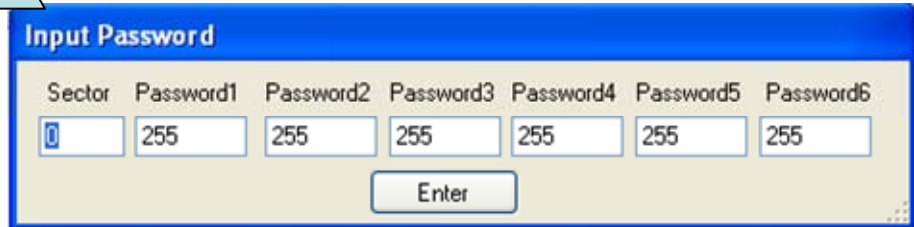
0x05: Write fail

0x0D: Not authenticate

0xF0: Checksum error

Key: Authentication key written if the operation succeeds, 6 bytes.





Private Sub Button12_Click(ByVal sender As System.Object, ByVal e As System.EventArgs) Handles Button12.Click

Form2.ShowDialog()

rfid1443a_write_master_key(Val(Form2.txtsector.Text),

Val(Form2.txtpassword1.Text), Val(Form2.txtpassword2.Text),

Val(Form2.txtpassword3.Text), Val(Form2.txtpassword4.Text),

Val(Form2.txtpassword5.Text), Val(Form2.txtpassword6.Text))

If rfid1443_return(&H7) = True Then

 ListBox1.Items.Add("Write master key (key A) Success")

 ListBox1.Items.Add("KEY=" & Hex(rfid1443a_return(4)) & ":" & Hex(rfid1443a_return(5))

& ":" & Hex(rfid1443a_return(6)) & ":" & Hex(rfid1443a_return(7)) & ":" & Hex(rfid1443a_return(8))

& ":" & Hex(rfid1443a_return(9)))

Else

 ListBox1.Items.Add("Write master key (key A) Error")

 If index_return > 0 Then

 Select Case rfid1443a_return(3)

Case &H.... 'Return code No tag Error

 ListBox1.Items.Add(rfid1443a_return(3) & "No tag")

Case &H.... 'Return code Write fail Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Write fail")

Case &H.... 'Return code Not authenticate Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Not authenticate")

Case &H.... 'Return code Checksum Error

 ListBox1.Items.Add(rfid1443a_return(3) & "Checksum error")

 End Select

 End If

End If

.....

End Sub

4-4-7. Write master key (key A)

0xBA	Len	0x07	Sector	Key	Checksum
------	-----	------	--------	-----	----------

Sector: The sector number to be written, 1 byte.

Key: Authentication key, 6 bytes

Return:

0xBD	Len	0x07	Status	Key	Checksum
------	-----	------	--------	-----	----------

Status: 0x00: Operation succeed

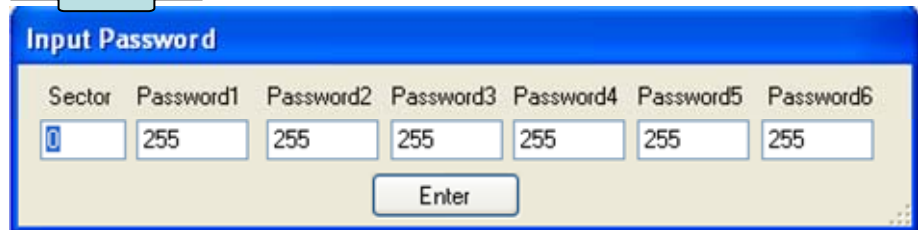
 0x01: No tag

 0x05: Write fail

 0x0D: Not authenticate

 0xF0: Checksum error

Key: Authentication key written if the operation succeeds, 6 bytes.



Private Sub rfid1443a_write_master_key(ByVal sector As Byte, ByVal password1 As Byte, ByVal password2 As Byte, ByVal password3 As Byte, ByVal password4 As Byte, ByVal password5 As Byte, ByVal password6 As Byte)

rf1443a_cmd(0) = &H.... 'Header
rf1443a_cmd(1) = &H.... 'Len
rf1443a_cmd(2) = &H.... 'Command
rf1443a_cmd(3) = sector 'Sector

rf1443a_cmd(4) = password1 'Password1
rf1443a_cmd(5) = password2 'Password2
rf1443a_cmd(6) = password3 'Password3
rf1443a_cmd(7) = password4 'Password4
rf1443a_cmd(8) = password5 'Password5
rf1443a_cmd(9) = password6 'Password6

rf1443a_cmd(10) = rfid1443a_checksum(9) 'Check Sum
SerialPort1.Write(rf1443a_cmd, 0, 11) 'Send Command

End Sub

4-4-7. Write master key (key A)

0xBA	Len	0x07	Sector	Key	Checksum
------	-----	------	--------	-----	----------

Sector: The sector number to be written, 1 byte.

Key: Authentication key, 6 bytes

Return:

0xBD	Len	0x07	Status	Key	Checksum
------	-----	------	--------	-----	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

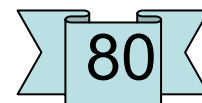
0x0D: Not authenticate

0xF0: Checksum error

Key: Authentication key written if the operation succeeds, 6 bytes.

Reader to Host:

Preamble	Len	Command	Status	Data	Checksum
----------	-----	---------	--------	------	----------



Function rfid1443_return

(ByVal rf1443cmd As Byte) As Boolean

Dim rx_byte As Byte Dim lenreturnbyte As Byte = 100 Dim exitloop As Boolean
 Dim timeend As Date Dim ret As Boolean index_return = 0
 timeend = Now.AddMilliseconds(2000)
 Do

```

If SerialPort1.BytesToRead > 0 Then
    rx_byte = SerialPort1.ReadByte
    If index_return = 3 Then
        Select Case rf1443cmd
            Case &H1 'Select Mifare card
                lenreturnbyte = .... ' Len return command
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
            Case &H2 'Login to a sector
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H3 'Read a data block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H4 'Write a data block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H5 'Read a value block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
            Case &H6 'Write a value block
                If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
                lenreturnbyte = .... ' Len return command
    
```

Case &H7 'Write master key (key A)

If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success

lenreturnbyte = ' Len return command

```

Case &H8 'Increment value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &H9 'Decrement value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
Case &HA 'Copy value
    If rx_byte <> &H.... Then exitloop = True 'Check Status Not Success
    lenreturnbyte = .... ' Len return command
    
```

End Select

End If

rf1443a_return(index_return) = rx_byte

index_return = index_return + 1

If index_return = lenreturnbyte Then exitloop = True

End If

If Now >= timeend Then

exitloop = True

End If

Loop While (exitloop <> True)

SerialPort1.DiscardInBuffer()

If index_return = lenreturnbyte Then

ret = True

End If

rfid1443_return = ret

End Function

4-4-7. Write master key (key A)

0xBA	Len	0x07	Sector	Key	Checksum
------	-----	------	--------	-----	----------

Sector: The sector number to be written, 1 byte.

Key: Authentication key, 6 bytes

Return:

0xBD	Len	0x07	Status	Key	Checksum
------	-----	------	--------	-----	----------

Status: 0x00: Operation succeed

0x01: No tag

0x05: Write fail

0x0D: Not authenticate

0xF0: Checksum error

Key: Authentication key written if the operation succeeds, 6 bytes.

```
-----  
Private Sub Form1_Load()  
    'File : from_load.txt  
End Sub  
-----  
Function rfid1443a_chcektagin() As Boolean  
    Dim r As Boolean  
    If SerialPort1.CD Holding = False Then r = True  
    rfid1443a_chcektagin = r  
End Function  
-----  
Private Sub rfid1443a_reset()  
    ' file : reset.txt  
End Sub  
-----  
Private Sub rfid1443a_select_card()  
    'file : select_card.txt  
End Sub  
-----  
Private Sub rfid1443a_login_sector()  
    ' file : login_sector.txt  
End Sub  
-----  
Private Sub rfid1443a_read_data_block()  
    ' file : read_data_block.txt  
End Sub  
-----  
Private Sub rfid1443a_write_data_block()  
    ' file : write_data_block.txt  
End Sub  
-----  
Private Sub rfid1443a_read_value_block()  
    ' file : read_value_block.txt  
End Sub  
-----  
Private Sub rfid1443a_write_value_block()  
    ' file : write_value_block.txt  
End Sub  
-----
```

RS232 Set ใช้กับทุกการทดลอง

1. ใช้ตรวจสอบ Tag
ว่าอยู่ในบริเวณที่สื่อสารได้หรือไม่

2. ใช้ Reset Reader

3. ใช้อ่าน UID Tag

4. ใช้ login Sector Tag

5. ใช้ Read data

6. ใช้ Write Data

8. ใช้ Read Value

7. ใช้ Write value

End Class

```
-----
Private Sub rfid1443a_write_master_key()
    ' file : write_master_key.txt
End Sub
```

12. ใช้ Write Key

```
-----
Private Sub rfid1443a_increment_value_block()
    ' file : increment_value_block.txt
End Sub
```

9. ใช้ Increment value

```
-----
Private Sub rfid1443a_decrement_value_block()
    ' file : decrement_value_block.txt
End Sub
```

10. ใช้ Decrement value

```
-----
Private Sub rfid1443_copy()
    ' file : copy.txt
End Sub
```

11. ใช้ Copy value

```
-----
Function rfid1443_return()
    ' file : return.txt
End Function
```

ใช้กับการทดลองตั้งแต่หมายเลข 3 ขึ้นไป

```
-----
Function rfid1443a_checksum()
    ' File : checksum.txt
End Function
```

ใช้กับการทดลองตั้งแต่หมายเลข 2 ขึ้นไป

```
-----
Private Sub Button6_Click()
    ' File : write_data_block_button.txt
End Sub
```

6. ใช้ Write data

```
-----
Private Sub Button2_Click()
    Button2.Click
    rfid1443a_reset()
End Sub
```

2. ใช้ Reset Reader

```
-----
Private Sub Button1_Click()
    If rfid1443a_chcektagin() = True Then
        ListBox1.Items.Add("TAG INP")
    Else
        ListBox1.Items.Add("TAG OUT")
    End If
End Sub
```

1. ใช้ตรวจสอบ Tag

ว่าอยู่ในบริเวณที่สื่อสารได้หรือไม่

```
-----
End Class
```

```
Private Sub Button4_Click()  
    ' File : login_sector_button.txt  
End Sub
```

4. ใช้ login Sector Tag

```
Private Sub Button3_Click()  
    'File : select_card_button.txt  
End Sub
```

3. ใช้อ่าน UID Tag

```
Private Sub Button13_Click(ByVal sender As System.Object, ByVal e  
    As System.EventArgs) Handles  
    Button13.Click  
    ListBox1.Items.Clear()  
End Sub
```

ใช้ Clear List Box

```
Private Sub Button5_Click()  
    ' File : read_data_block_button.txt  
End Sub
```

5. ใช้ Read data

```
Private Sub Button7_Click()  
    ' File : write_value_block_button.txt  
End Sub
```

7. ใช้ Write value

```
Private Sub Button8_Click()  
    ' File : read_value_block_button.txt  
End Sub
```

8. ใช้ Read Value

```
Private Sub Button9_Click()  
    'File: increment_value_block_button.txt  
End Sub
```

9. ใช้ Increment value

```
Private Sub Button10_Click()  
    ' File : decrement_value_block_button.txt  
End Sub
```

10. ใช้ Decrement value

```
Private Sub Button11_Click()  
    'File : copy_button.txt  
End Sub
```

11. ใช้ Copy value

```
Private Sub Button12_Click()  
    'File : write_master_key_button.txt  
End Sub
```

12. ใช้ Write Key

End Class