

Application Note

RF PC Handheld Reader Module H102022. H102024

Firmware: 0.2

11/17/2003, wk

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1 Scope

The RFID 13.56 MHz RF PC Handheld Reader Module is a read write device that supports a broad range of transponders. It is designed to communicate with ISO15693, Tagit® and Icode®. With its integrated antenna and compact flash type 2 connector it is ready to use and easily connected into a handheld, laptop or tablet PC.

The RFID ISO 14443 AB RF PC Handheld Reader supports Mifare Standard, Ultralight, ProX and DESFire tags. Its open structure of the transfer command set allows to communicate with a broad range of dual processor cards based on ISO 14443-4.

Using a PCMCIA adapter it can be connected into a PCMCIA slot type 2. The unit includes a device driver for Windows 98, Me, 2000, NT Service Pack 4 and XP.

This document describes the installation of the device driver and an easy access to the RF PC Handheld Reader Modules. The command set of the RFID 13.56 MHz RF PC Handheld Reader Module is described in detail in the document RFID 13.56 MHz Multitag Reader Module [1] and is not listed here. The command set of the RFID ISO 14443 AB RF PC Handheld Reader Module is described in RFID Mifare Family Reader Module documentation [2].

WARNING:

Some PCMCIA adapters of handheld PCs are not compatible with the RF PC Handheld Readers. Extensive testing of used hardware is needed prior to any design-ins. No problems have been reported using Compact Flash adapters so far.

This product may be bundled with third party software. The warranty provisions of the document do not apply to such third party software. If a separate end user license agreement has been provided for such third party software, use of that software will be governed by that agreement.

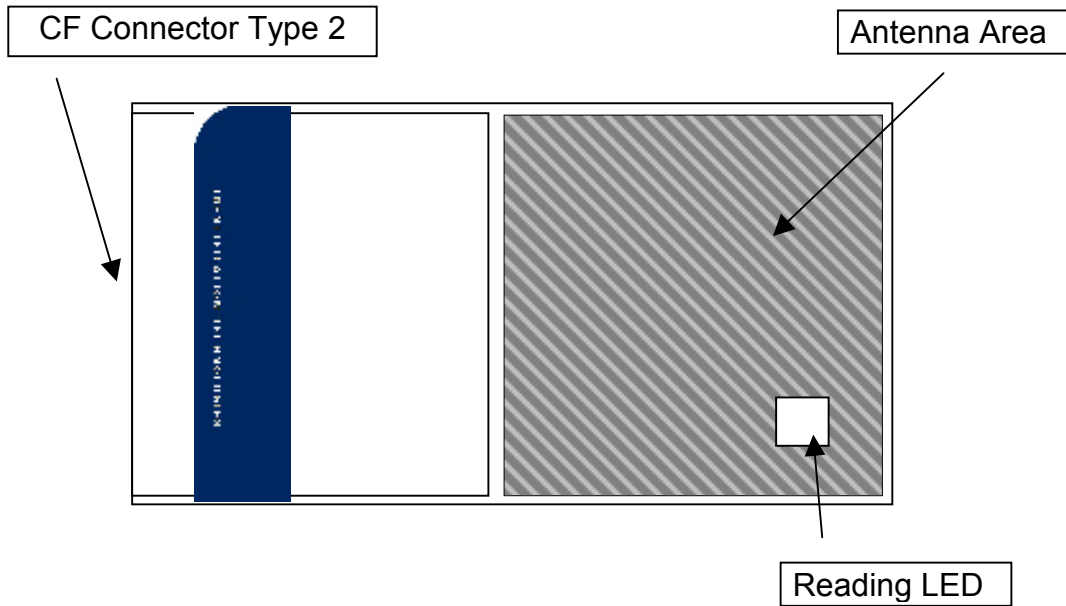
WARRANTY

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

CAUTION:

ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

2 Hardware



2.1 Remarks

The antenna must be free from any metal. A metal will prohibit the antenna field and less reading performance is reached.

3 Software

The RFID 13.56 MHz RF PC Handheld Reader Module is compatible to the RFID 13.56 MHz Multitag Reader Module H102022 [1].

The RFID ISO 14443 AB RF PC Handheld Reader Module is fully compatible to the RFID ISO 14443 AB Reader Module H102024 [2].

3.1 Installation of the PCMCIA driver

The RF PC Handheld Reader Module can be connected to a laptop or a PC using an adapter of PCMCIA type 2.

1. First time the module is plugged into the slot the user will be prompt to install the correct driver.
2. Follow the instructions on the screen.
3. Click on 'Have Disk...' to define the driver location manually.
4. go to folder 'RCPCHandheldRFID' and double-click on 'RFPCHandheldRFID.inf'.
5. Finish the installation

The system has loaded all necessary drivers of the RF PC Handheld Reader Module. Using a terminal program (e.g. HyperTerminal) the module can be accessed by opening the appropriate COM port.

3.1.1 HyperTerminal settings

First you have to connect to the correct COM port. Normally the system sets up COM 4 or COM 5 for the PCMCIA slots. The baud rate depends on the startup settings of the reader device. Default is 9600 baud.

Description
8 data bits
No parity bit
1 stop bit
No flow control

Figure 3-1: Communication settings

3.2 Pocket PC2002

Pocket PC2002 has not included a simple terminal program like HyperTerminal. Following steps create a connection to the RF PC Handheld Reader Module. Pocket PC internally detects all CF or PCMCIA slots and can manage them without any driver installation.

1. Plug the RF PC Handheld Reader Module into the CF slot.
2. Click on 'start->Settings'
3. Go to tab 'connections' and click on 'connection with the internet'
4. Create a new connection
5. Type in a new name of the connection (e.g. 'RFID')
6. Go to tab 'modem' and create a new modem connection
7. Type in a name
8. Choose as modem 'RFID_AT-RF_PC_Handheld_Reader' and set baud rate to 9600
9. Change to modem settings to following: data bits 8, parity no, stop bit 1, no flow control
10. Enable all checkboxes below and click 'OK'
11. Click on continue and disable both checkboxes and finish the set up.
12. Run new connection.
13. Click ok when the system prompts for a login.
14. A terminal window appears
15. Type in any command

Refer to the appropriate documentations for a detailed description of the command set. Alternatively the demonstration program RFIDReader.exe can be used to access the RF PC Handheld Reader.

3.3 Pocket PC2003

The new operating systems PocketPC2003 (Windows CE 4.2) cannot be access in the same way. To access the RF PC Handheld module a small software is needed which handles a COM port. An open source project is available to illustrate basic communication to the device. (RFIDReader.exe).

3.4 Writing your own Application in Visual C++

This example illustrates the access to a com port of a handheld. A handheld normally sets the serial port of the CF slot to 4, 5, or 6.

```
// set the appropriate com port
CString m_Serial = "com4";
bool m_contReceiveMode = false;
HANDLE hComm;

// Open communication
hComm = CreateFile(m_Serial.GetBuffer(), GENERIC_READ |
GENERIC_WRITE, 0, NULL, OPEN_EXISTING, FILE_FLAG_WRITE_THROUGH,
NULL);
if (hComm == INVALID_HANDLE_VALUE)
{
    printf("error\n");
    hComm = NULL;
}
else
{
    COMMTIMEOUTS noblock;
    DCB dcb;

    // set communication timeout
    GetCommTimeouts(hComm, &noblock); // get communication timeouts
    if (m_contReceiveMode == false)
    {
        // get answer (ReadFile waits for answer until timeout)
        // use timeouts, because it is easier to handle
        noblock.ReadTotalTimeoutConstant = 2000; // 2 seconds timeout
        noblock.ReadTotalTimeoutMultiplier = MAXDWORD;
        noblock.ReadIntervalTimeout = MAXDWORD;
    }
    else
    {
        // get answer for polling (immediate return from ReadFile)
        noblock.ReadTotalTimeoutConstant = 0;
        noblock.ReadTotalTimeoutMultiplier = 0;
        noblock.ReadIntervalTimeout = MAXDWORD;
    }
    if (SetCommTimeouts(hComm, &noblock) == 0) // set communication
timeouts
        printf("error\n");

    // set communication state
    GetCommState(hComm, &dcb);
    dcb.BaudRate = 9600;
    dcb.ByteSize = 8;
    dcb.fParity = FALSE;
```

```
dcb.StopBits = ONESTOPBIT;
//***** IMPORTANT LINES
dcb.fDtrControl = DTR_CONTROL_ENABLE;
dcb.fRtsControl = RTS_CONTROL_DISABLE;

if (SetCommState(hComm, &dcb) == 0)
    printf("error\n");
}

/* type in your application here*/

// close communication and free handle
CloseHandle(hComm);
```

Figure 3-2: Source code of com settings

3.4.1 Remarks

The DTR signal is used to switch on and off the whole unit. The DCB block manages to set a connection to the RF PC Handheld Reader Module. Opening and closing the COM port is used to enable and disable the whole device. This ends up in a customizable power management.

3.5 Writing applications in embedded Visual Basic

The DTR signal must be handled in the same way as described above. The DTR signal switches on and off the whole unit. Since the com port module of Visual Basic does not support the DTR easily a more sophisticated solution is needed.

It is not recommended to write applications in Visual Basic.

4 Revision History

Date	Revision number
9/18/2003	0.1
10/7/2003	0.2
11/17/2003	0.3

5 References

[1] RFID 13.56 MHz Multitag Reader Module Documentation, H102022

[2] RFID ISO 14443 AB Reader Module Documentation, H102024

[3] <http://www.ehag.ch>

[4] <http://www.microsoft.com>