

# OEM-DESFire Series

## 13.56 MHz OEM RFID Module

### Test Software Brief Manual

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Issue 0.5  
– 18. January 2022 –

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## 1 Operation Examples

### 1.1 USB Driver Installation

If the device is connected to a PC for the first time, it can take some time for automatic installation of the Silicon Labs 210x Series VCP driver. If this is the case, pls. wait until this is fully done.

In rare cases it is possible, that automatic installation fails. Then perform a manual installation.

You can download the latest drivers here:

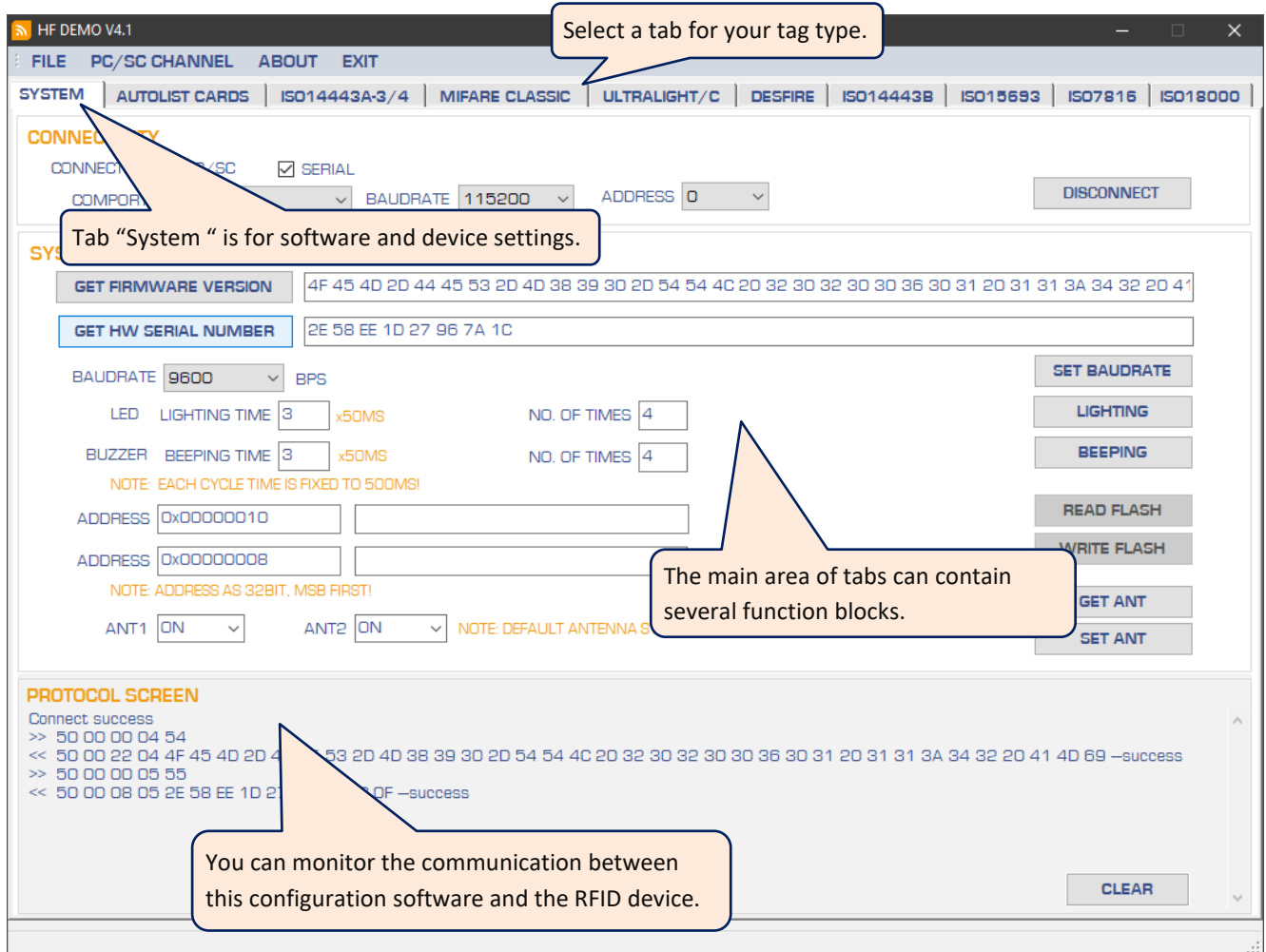
<https://www.silabs.com/developers/usb-to-uart-bridge-vcp-drivers>

### 1.2 Driver Installation PC/SC

Support for PC/SC is part of Windows OS. The automatic installation of the device driver takes much longer than for the serial interface (VCP). If you plug in the device for the first time, please wait until all processes finish.

If you place an RFID tag to a PC/SC device for the first time, further drivers need to be installed. Please be patient until this is completely finished.

### 1.3 Software Screen Overview



## 2 Software Functions in Detail

### 2.1 Tab “System”

#### 2.1.1 Establishing Connection (VCP)

HF DEMO V4.1

FILE PC/SC CHANNEL ABOUT EXIT

SYSTEM AUTOLIST CARDS ISO14443A-3/4 MIFARE CLASSIC ULTRALIGHT/C DESFIRE ISO14443B ISO15693 ISO7816 ISO18000

**CONNECTIVITY**

CONNECTION ☐ PC/SC ☒ SERIAL

COMPORT COM8 BAUDRATE 115200 ADDRESS 0 DISCONNECT

The factory default setting for DESFire devices is 115200 Baud.

Establish the connection with [Connect]. Please pay attention to the status message on the Protocol Screen at the bottom of this software.

#### 2.1.2 Establishing Connection (PC/SC)

Checkmark “PC/SC” and select your device from the pull down menu “COMPORT”.

### 2.2 Reading Firmware Version and Hardware Serial Number

**SYSTEM**

GET FIRMWARE VERSION 4F 45 4D 2D 44 45 53 2D 4D 38 39 30 2D 54 54 4C 20 32 30 32 30 30 36 30 31 20 31 31 3A 34 32 20 41

GET HW SERIAL NUMBER 2E 58 EE 1D 27 96 7A 1C

#### 2.2.1 Changing The Baudrate

Do not change the baudrate using this function!

#### 2.2.2 IO Commands

Some devices have hardware to react to LED and Buzzer commands.

LED LIGHTING TIME 3 x50MS NO. OF TIMES 4 LIGHTING

BEEPER BEEPING TIME 3 x50MS NO. OF TIMES 4 BEEPING

NOTE: EACH CYCLE TIME IS FIXED TO 500MS!

#### 2.2.3 Address Setting (Reserved for Future Use)

This is intended for device working on an RS485 bus.

ADDRESS 0x00000010 READ FLASH

ADDRESS 0x00000008 WRITE FLASH

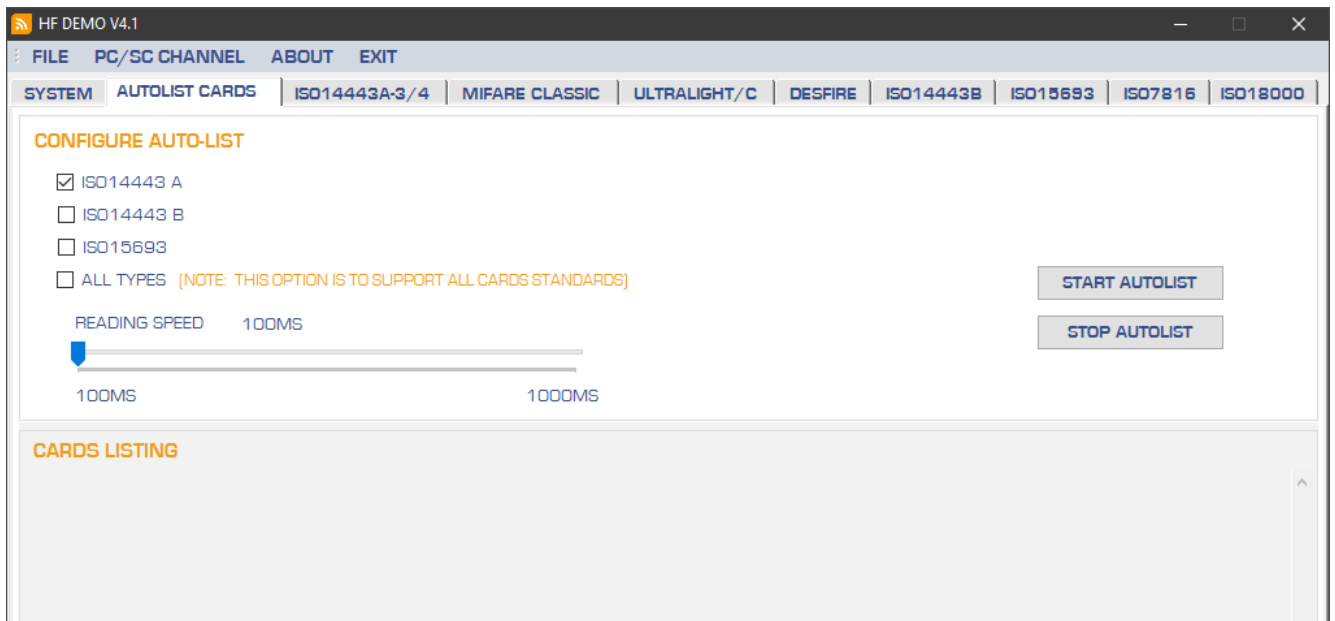
NOTE: ADDRESS AS 32BIT, MSB FIRST! GET ANT

#### 2.2.4 Antenna Configuration

NOTE: ADDRESS AS 32BIT, MSB FIRST!

ANT1 ON ANT2 ON NOTE: DEFAULT ANTENNA STATUS IS OPENED! GET ANT SET ANT

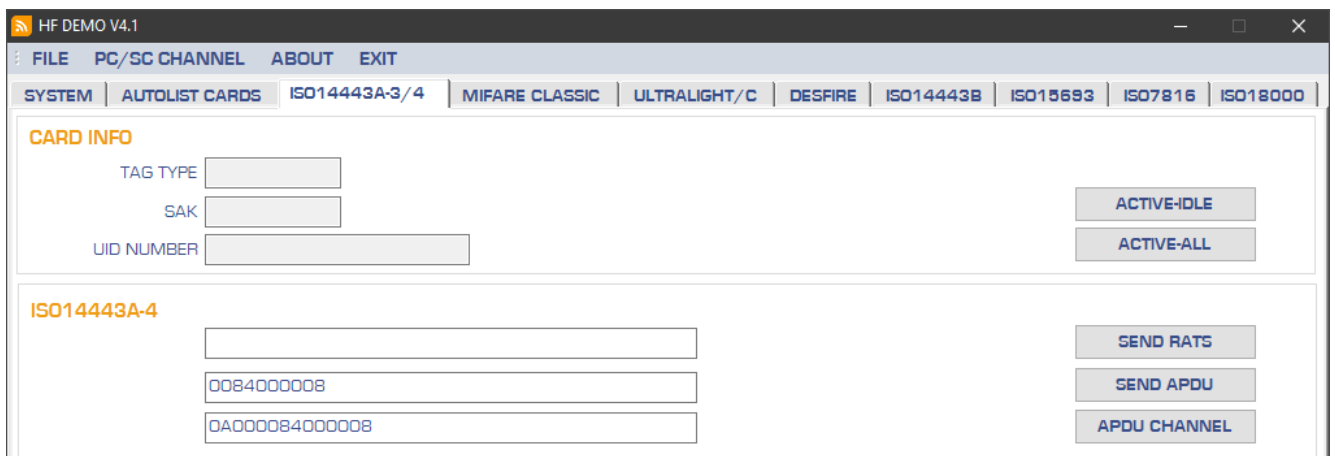
## 2.3 Tab “AUTOLIST CARDS”



This tab is to send continuous commands to detect tags. Use this tab to detect the tag type.

This is not a configuration tab for the explicit auto-list cards configuration command 0x23.

## 2.4 Tab “ISO1443A-3/4”



Active-IDLE= Send REQ, Anticollision, select, this will only work with cards that are NOT halted.

Active-ALL = Send WUPA , Anticollision, select, this will work with all cards.

## 2.5 Tab “MIFARE Classic”

HF DEMO V4.1

FILE PC/SC CHANNEL ABOUT EXIT

SYSTEM AUTOLIST CARDS ISO14443A-3/4 **MIFARE CLASSIC** ULTRALIGHT/C DESFIRE ISO14443B ISO15693 ISO7816 ISO18000

**CARD INFO**

TAG TYPE  SAK

UID NUMBER

MEMORY SIZE

BLOCK SIZE

NUMBER OF BLOCKS

NUMBER OF SECTORS

APDU

ACTIVE-IDLE

ACTIVE-ALL

APDU CHANNEL

**MIFARE CLASSIC 1K&4K**

CARD UID

BLOCK ADDR  KEY TYPE  KEY

NOTE: EXCEPT FOR FUNCTION OF "READ ALL BLOCKS", ALL COMMANDS MUST DO AUTHENTICATE FIRSTLY!

AUTHENTICATE

READ BLOCK

WRITE BLOCK

READ ALL BLOCKS

E-WALLET

If you have detected a Mifare Classic card with [ ACTIVE-IDLE ] or [ ACTIVE-ALL ], you can click on [ READ ALL BLOCKS] to read out all accessible memory blocks or on [ E-WALLET] to check the payment functions for Mifare Classic.

READ ALL BLOCKS

UID

DEFAULT KEY

KEY TYPE

READ ALL BLOCKS

MEMORY INFO

DATA OUTPUT IS IN HEXADECIMAL NUMBERS

Sector:00  
1C 53 73 06 FA 88 04 00 48 85 14 90 49 20 50 10  
11 11 11 11 11 11 11 11 11 11 11 11 11 11 11  
22 22 22 22 22 22 22 22 22 22 22 22 22 22  
00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF

Sector:01  
44 44 44 44 44 44 44 44 44 44 44 44 44 44  
55 55 55 55 55 55 55 55 55 55 55 55 55 55  
66 66 66 66 66 66 66 66 66 66 66 66 66 66  
00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF

Sector:02  
88 88 88 88 88 88 88 88 88 88 88 88 88 88  
99 99 99 99 99 99 99 99 99 99 99 99 99 99  
AA AA AA AA AA AA AA AA AA AA AA AA AA AA  
00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF

Sector:03  
CC CC CC CC CC CC CC CC CC CC CC CC CC CC  
DD DD DD DD DD DD DD DD DD DD DD DD DD DD  
EE EE EE EE EE EE EE EE EE EE EE EE EE EE  
00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF

PROTOCOL SCREEN

<< 50 01 00 27 FF  
FF  
00 FF 07 80 69 FF  
FF  
00 00 00 00 00 00 FF 07 80 69 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF  
FF  
FF  
FF  
FF  
FF  
76 —success

CLEAR

E-WALLET

INITIALIZE VALUE

INCREASE VALUE

DECREASE VALUE

BACKUP TO

BALANCE

INITIALIZE

INCREASE

DECREASE

BACKUP

READ VALUE

PROTOCOL SCREEN

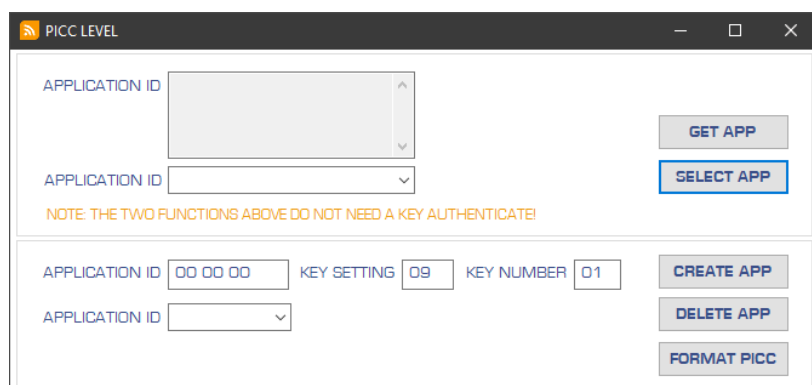
CLEAR

## 2.6 Tab "Ultralight/C"

If you need to access further Ultralight functions, refer to the tag's manual and use the APDU channel to send manufacturer-specific commands directly to the RFID tag.

## 2.7 Tab "DESFire"

The memory of a DESFire RFID tag is organized as a computer memory. You can have folders, which are called "Applications". Access the Application management by click on the button [ PICC LEVEL ].



**PICC LEVEL**

APPLICATION ID

APPLICATION ID

NOTE: THE TWO FUNCTIONS ABOVE DO NOT NEED A KEY AUTHENTICATE

APPLICATION ID  KEY SETTING  KEY NUMBER

APPLICATION ID

GET APP

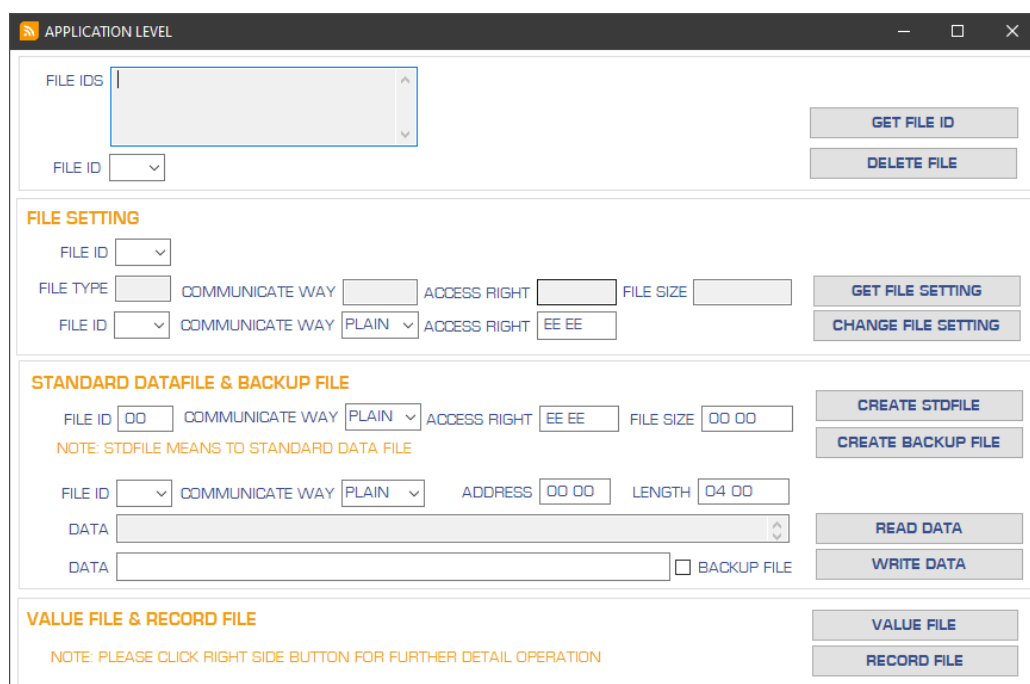
SELECT APP

CREATE APP

DELETE APP

FORMAT PICC

After you have selected or created an Application, you can open the file management by click on the button [ APPLICATION LEVEL ] in the main screen.



**APPLICATION LEVEL**

FILE IDS

FILE ID

GET FILE ID

DELETE FILE

**FILE SETTING**

FILE ID

FILE TYPE  COMMUNICATE WAY  ACCESS RIGHT  FILE SIZE

FILE ID  COMMUNICATE WAY  ACCESS RIGHT

GET FILE SETTING

CHANGE FILE SETTING

**STANDARD DATAFILE & BACKUP FILE**

FILE ID  COMMUNICATE WAY  ACCESS RIGHT  FILE SIZE

NOTE: STDFILE MEANS TO STANDARD DATA FILE

CREATE STDFILE

CREATE BACKUP FILE

FILE ID  COMMUNICATE WAY  ADDRESS  LENGTH

DATA

DATA  ☐ BACKUP FILE

READ DATA

WRITE DATA

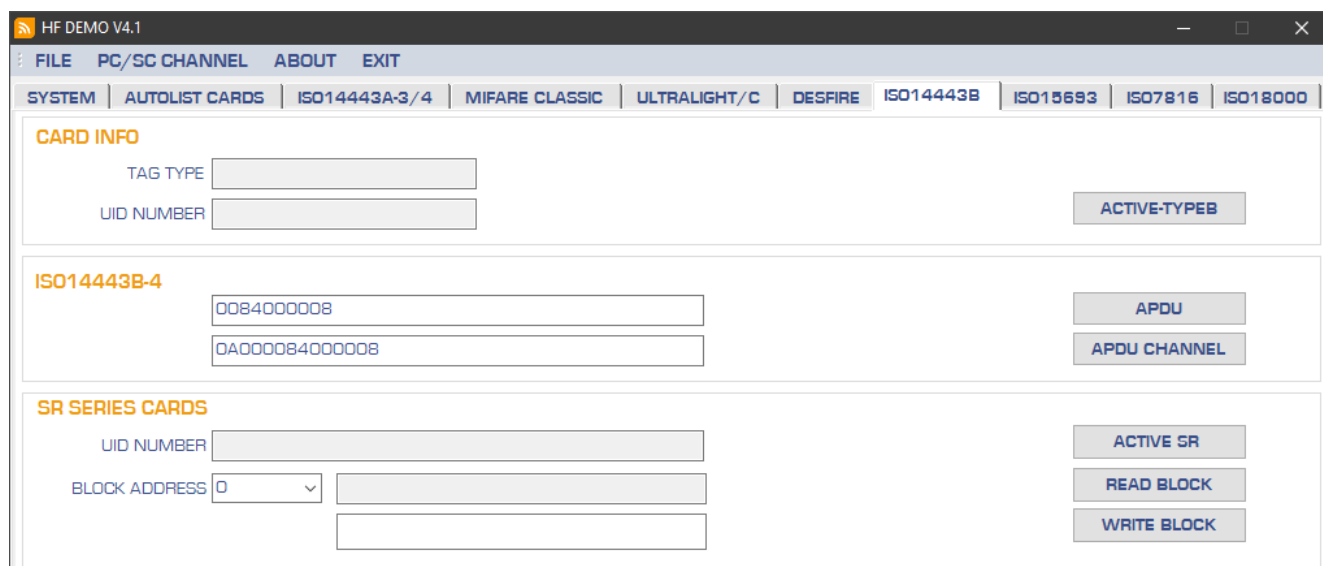
**VALUE FILE & RECORD FILE**

NOTE: PLEASE CLICK RIGHT SIDE BUTTON FOR FURTHER DETAIL OPERATION

VALUE FILE

RECORD FILE

## 2.8 Tab “ISO 14443B”



**HF DEMO V4.1**

FILE PC/SC CHANNEL ABOUT EXIT

SYSTEM AUTOLIST CARDS ISO14443A-3/4 MIFARE CLASSIC ULTRALIGHT/C DESFIRE ISO14443B ISO15693 ISO7816 ISO18000

**CARD INFO**

TAG TYPE

UID NUMBER

ACTIVE-TYPES

**ISO14443B-4**

APDU

APDU CHANNEL

**SR SERIES CARDS**

UID NUMBER

BLOCK ADDRESS

ACTIVE SR

READ BLOCK

WRITE BLOCK

## 2.9 Tab “ISO15693”

The screenshot shows the 'ISO15693' tab in the HF DEMO V4.1 application. The interface includes a menu bar (FILE, PC/SC CHANNEL, ABOUT, EXIT) and a tab bar with options: SYSTEM, AUTOLIST CARDS, ISO14443A-3/4, MIFARE CLASSIC, ULTRALIGHT/C, DESFIRE, ISO14443B, ISO15693 (selected), ISO7816, and ISO18000. The main area is titled 'ISO15693' and contains several input fields and buttons. On the left, there is a 'UID NUMBER' dropdown, a checked 'USE 16 TIMES SLOT' checkbox, and a note: 'NOTE: CHECKMARK "USE 16 TIMES SLOT" WHEN READING MULTIPLE CARDS!'. Below this is an 'APDU' text field containing '0A0000840000008'. In the center, there is a 'FLAG' dropdown set to '0x22', a 'BLOCK ADDR' dropdown set to '2', and a text field containing '11223344'. A note below these fields states: 'NOTE: DEFAULT FLAG=0x22, YOU NEED UID FOR ALL OPERATIONS! FOR SINGLE CARD OPERATION, THERE IS NO NEED TO DO INVENTORY FIRSTLY!'. At the bottom left, there are 'AFI' and 'DSFID' text fields, each with an attention note: 'ATTENTION: BE CAREFUL WHEN DO LOCK AFI, THIS IS ONE TIME OPERATION!' and 'ATTENTION: BE CAREFUL WHEN DO LOCK DESFID, THIS IS ONE TIME OPERATION!'. There is also a 'UID-CLASS' text field. On the right side, there is a vertical column of buttons: INVENTORY, SELECT CARD, STAY QUIET, APDU CHANNEL, READ BLOCK, WRITE BLOCK, LOCK BLOCK, WRITE AFI, LOCK AFI, WRITE DSFID, LOCK DSFID, GET CARD INFO, and GET ICLASS.

## 2.10 Tab “ISO7816”

The screenshot shows the 'ISO7816 PSAM' tab in the HF DEMO V4.1 application. The interface is similar to the previous one, with the same menu bar and tab bar. The main area is titled 'ISO7816 PSAM' and contains input fields and buttons. On the left, there is a 'SAM SLOT' dropdown set to 'SAM1', a 'BAUDRATE' dropdown set to '9600', and a note: 'NOTE: DEFAULT BAUDRATE IS 9600BPS!'. Below these is an 'ATS' text field and an 'APDU' text field containing '00840000008'. At the bottom, there is a note: 'NOTE: 1. DEFAULT BAUDRATE IS 9600 BPS 2. IF THE BAUDRATE OF PSAM CARD IS NOT 9600, PLS SET IT TO CORRECT VALUE.' On the right side, there is a vertical column of buttons: DETECT, SET, POWER ON, and SEND APDU.

## 2.11 Tab “ISO18000”

### 2.11.1 Overview

HF DEMO V4.0

FILE PC/SC CHANNEL ABOUT EXIT

SYSTEM | AUTOLIST CARDS | ISO14443A-3/4 | MIFARE CLASSIC | ULTRALIGHT/C | DESFIRE | ISO14443B | ISO15693 | ISO7816 | ISO18000

**ISO18000-3**

EPC/UII NUMBER

EPC/UII NUMBER  PC

RN16/HANDLE

MEMORY BANK  START ADDR  NUMBER OF BLOCKS

READ DATA

DATA TO WRITE

PASSWORD  OPTIONS

PMASK  PACTION

RECOMM BITS

HANDLE

POINTER LENGTH

INVENTORY

ACK

REGEN

READ

WRITE

ACCESS

LOCK

KILL

SET HANDLE

BLOCK WRITE

BLOCK ERASE

BLOCK PERMA LOCK

**PROTOCOL SCREEN**

CLEAR

### 2.11.2 Write 1 Block of Data in Block 0x0004

**HF DEMO V4.1**

FILE PC/SC CHANNEL ABOUT EXIT

SYSTEM AUTOLIST CARDS ISO14443A-3/4 MIFARE CLASSIC ULTRALIGHT/C DESFIRE ISO14443B ISO15693 ISO7816 ISO18000

**ISO18000-3**

EPC/UUI NUMBER 000000000000480138F2512D

EPC/UUI NUMBER

RN16/HANDLE

MEMORY BANK USER START ADDR 0400 NUMBER OF BLOCKS 0x00 00

READ DATA 00 00 11 11 22 22 33 33 00

DATA TO WRITE 4444

PASSWORD 00

OPTIONS NO COVER CODING

PACTION 00 00

RECOMM BITS 00

HANDLE 00 00

POINTER LENGTH

INVENTORY

ACK

REGEN

READ

WRITE

ACCEPT

KILL

SET HANDLE

BLOCK WRITE

BLOCK ERASE

BLOCK PERMA LOCK

**PROTOCOL SCREEN**

>> 50 00 07 B5 00 03 04 00 00 44 44 E5

<< 50 00 00 B5 E5 —success

CLEAR

1. Enter the start address. This value is hexadecimal with the least-significant Byte first (leftmost).

2. Enter 1 block = 2 Bytes of data to write.

3. Click on [WRITE].

4. Monitor the result here.

#### Important Note

The I-Code ILT-M supports to write only 1 block at once using this command.

### 2.11.3 Read All Blocks, New Data at Block 0x0004

[illegible]