

## Configuration Software for the Keyboard Emulation (HID Operation Mode)

NEO2

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Issue 0.9  
– 07. Juli 2025 –

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## 1 Installation

### 1.1 Function Description

This RFID device can be either operated in full read/write mode or in automatic read mode with keyboard emulation. The keyboard emulation works as a compatible HID\* device, so that it will operate with the most common operating systems.

**When in keyboard emulation mode, it is not possible to do normal read/write operations.**

\* Human Interface Device

### 1.2 USB Driver Installation

For the NEO2 family, use the driver for the CH340 chip. The driver is no longer installed automatically by the Windows OS. Use the files in the folder "USB\_Drivers" of the NEO2 SDK to install the driver.

### 1.3 Installing the Configuration Software

Install the software with the executable HID-Setting-Setup.msi. Once the installation is finished, you will have a new icon on your computer desktop:



Double-click on this icon to start the software.

## 2 Configuration Software "HID Setting"

### 2.1 Software Overview

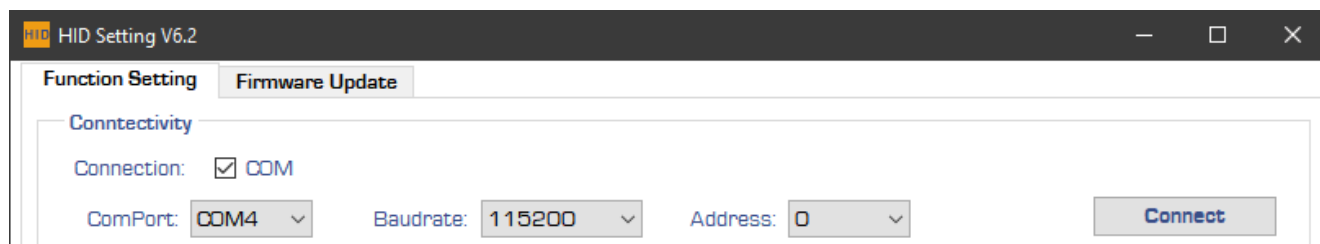
1. Select the communication parameters such as the ComPort and the Baudrate, then click on the button **[Connect]** to establish a connection with the reader.
2. Set the HID Operation Mode (O means off, I means on) using the **switch**.
3. Select the tag type you are using and the data that shall be read using the **dropdown menu**.
4. Finally, store the settings in the reader device using the button **[SET READER]**.
5. The communication between the software and the reader device can be monitored in the box named **Protocol Screen**.

The screenshot shows the 'HID Setting V6.2' application window. It has two tabs: 'Function Setting' (selected) and 'Firmware Update'. The 'Function Setting' tab contains several sections:

- Connectivity**: Includes 'Connection' (set to COM), 'ComPort' (COM1), 'Baudrate' (115200), and 'Address' (0). A blue '1 Connect' button is on the right.
- Settings Dual HID Mode**: Contains a 'Set Reader to HID Mode' switch (labeled '2' and turned on), a 'Working Mode' dropdown (labeled '3' and set to '00: HF 14443A LSB'), 'Memory Position' (00), 'Data Position' (0), 'Data Length' (16), 'Memory Key' (Key A checked, Key B unchecked, value FF FF FF FF FF FF), 'Output Format' (Number checked, ASCII unchecked), and 'HID Format' (Lowercase checked, Uppercase unchecked).
- LF + HF Enable**: Includes 'HF Data Format' (00 = 00: HF 14443A LSB), 'LF Data Format' (10: LF Read UID LSB of read-only tag type), and 'LF Page Address' (00). A red '4 SET READER' button is on the right.
- Prefix** and **Postfix**: Each has three dropdowns (Prefix1, Prefix2, Prefix3 and Postfix1, Postfix2, Postfix3) all set to 'No Prefix' or 'No Postfix'. A 'SET' button is below them.
- Protocol Screen**: A large purple box (labeled '5') for monitoring communication, with a 'CLEAR' button on the right.

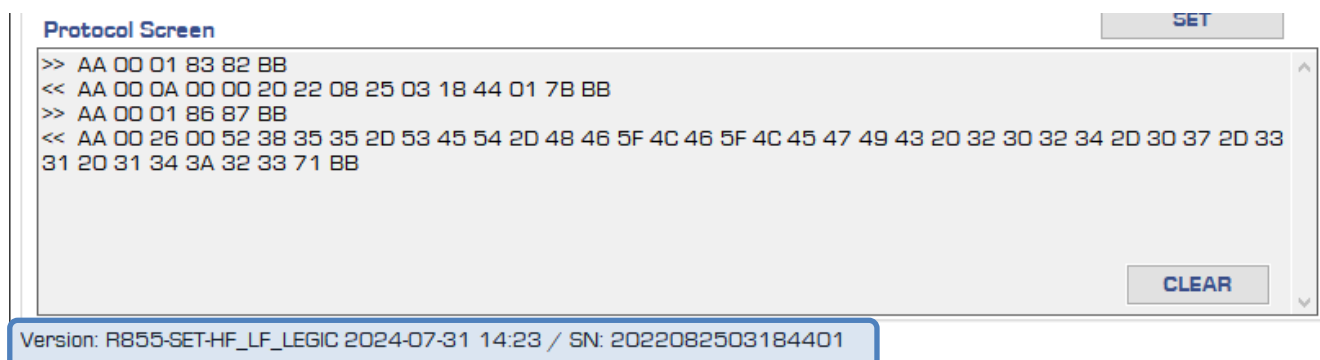
## 2.2 Connect your Device for Configuration

Please plug in the device first before starting the configuration software "HID Setting". Then start the configuration software "HID Setting".



If you have an early version of the NEO2 or have set it to other baudrates on purpose, please select the appropriate baudrate (the NEO2 firmware from before 2022-09-13 uses 9600 Baud, later versions use 115200 Baud).

Then click on [Connect]. You should see 4 lines of communication in the Protocol Screen and the firmware information and serial number shown in the [status bar](#).



### 2.3 Configuration for Dual Mode

The NEO2 devices with order code ending with HF-LF or HF-UHF support dual mode, meaning the device can be configured to read HF tags and UHF tags at the same time. Dual mode is working in HID mode as well.

After connecting to the device, to set the device into dual mode,

1. Select **Working Mode** "30: LF / UHF + HF Enable"
2. Configure the **data format** for HF mode and LF / UHF mode
3. Save the settings by clicking the button **[Set Reader]**.

**HID Setting V6.3**

**Function Setting** | **Firmware Update**

**Connectivity**

Connection: ☒ COM

ComPort: COM1 Baudrate: 115200 Address: 0 **Connect**

**Settings Dual HID Mode**

Set Reader to HID Mode ☒

**Working Mode** 30: LF / UHF + HF Enable 1

Memory Position 00 Data Position 0 Data Length 16

Memory Key (if applicable) ☒ Key A ☐ Key B Key FF FF FF FF FF FF

Output Format ☒ Number ☐ ASCII

HID Format ☒ Lowercase ☐ Uppercase

**LF/UHF + HF Enable** 2

HF Data Format 00: HF 14443A LSB

LF/UHF Data Format 1E: UHF Read EPC

LF Page Address 00

**SET READER** 3

**Prefix** Prefix1 No Prefix Prefix2 No Prefix Prefix3 No Prefix

**Postfix** Postfix1 No Postfix Postfix2 No Postfix Postfix3 No Postfix

**Protocol Screen** **SET**

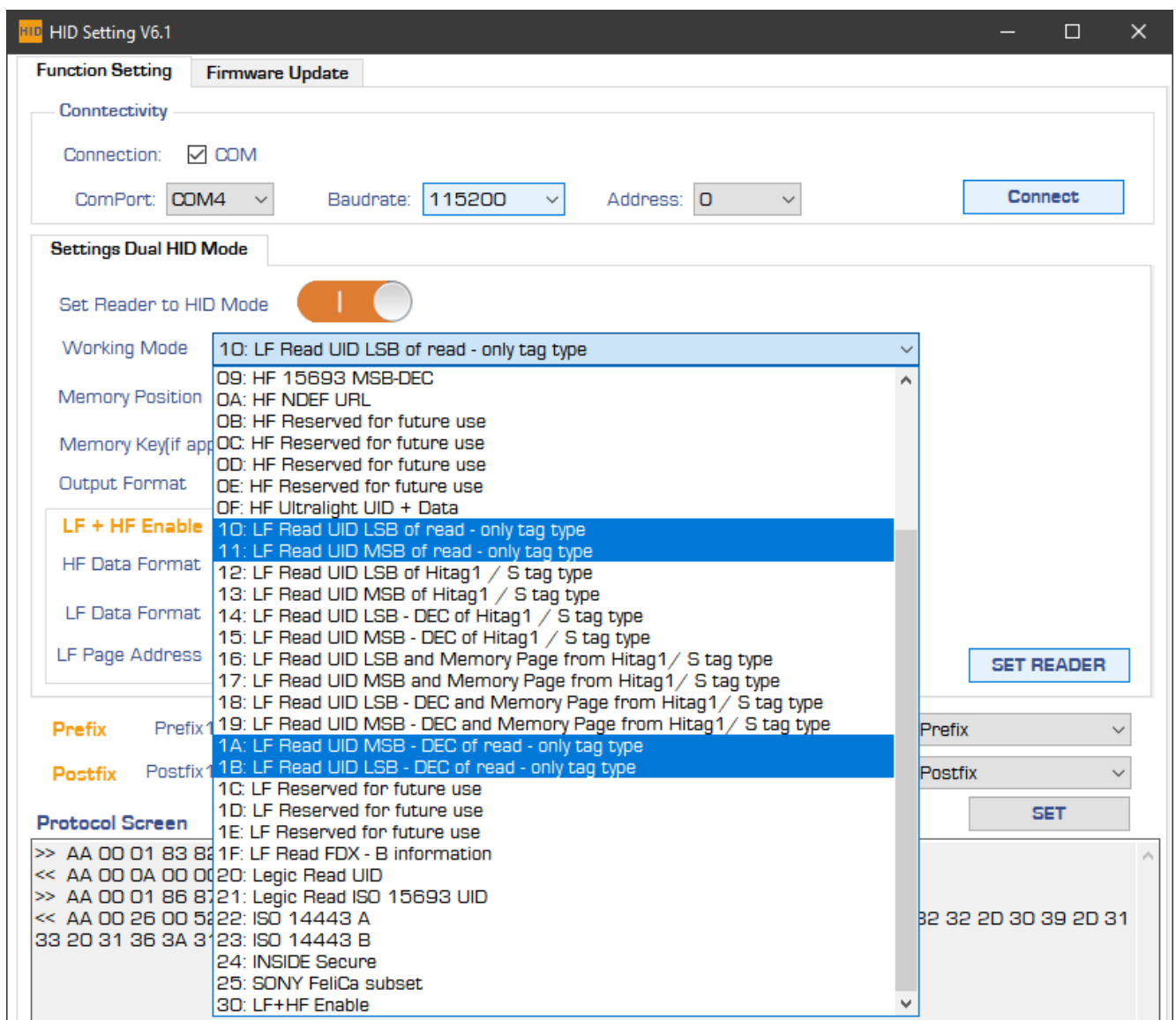
**CLEAR**

### 3 Configuration Examples

For configuration of prefixes and postfixes see file "NEO2-LF\_HF Configurable Prefixes and Postfixes".

#### 3.1 Capturing the UID of LF read-only RFID tags

1. As of 2022-09-13, the firmware uses 115200 Baud
2. Click on [Connect]
3. Switch the HID function on.
4. The functions **10/11** and **1A/1B** will read and output the UID in various Byte order (LSB or MSB) and number representations (hex or decimal).
5. Store the configuration in the RFID device with [Set Reader]



In the log screen, it should say **00** for Status = OK.



**Protocol Screen**

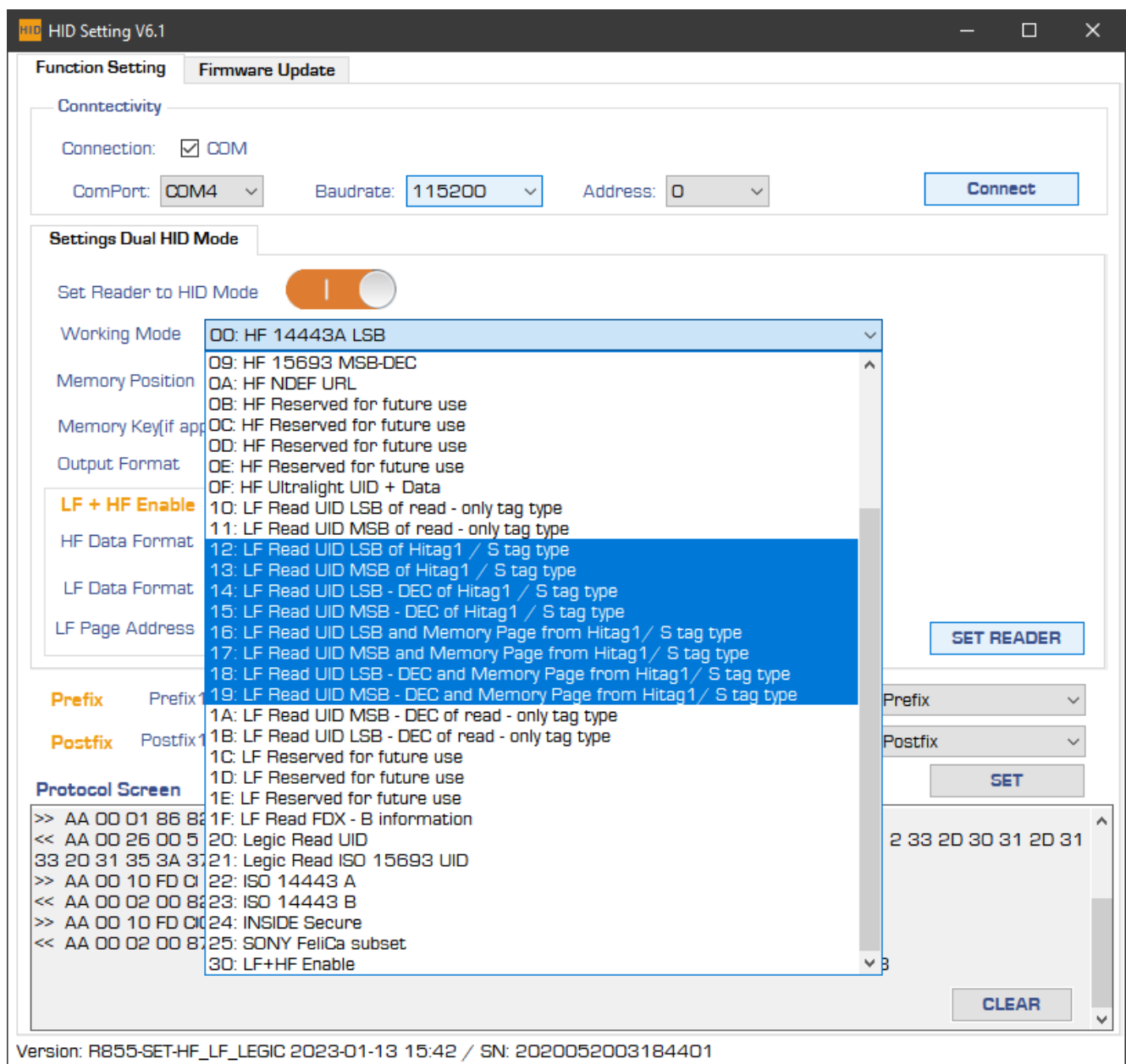
```

>> AA 00 01 83 82 BB
<< AA 00 0A 00 00 20 05 20 03 18 44 01 71 BB
>> AA 00 01 86 87 BB
<< AA 00 26 00 52 38 35 35 2D 53 45 54 2D 48 46 5F 4C 46 5F 4C 45 47 49 43 2D 32 30 32 32 2D 30 39 2D 31
33 20 31 36 3A 31 30 7B BB
>> AA 00 10 FD 00 1B 00 FF FF FF FF 10 60 00 00 10 00 56 BB
<< AA 00 02 00 80 82 BB

```

### 3.2 Capturing the UID or Data from Hitag 1/S Type RFID Tags

1. As of 2022-09-13, the firmware uses 115200 Baud
2. Click on [Connect]
3. Switch the HID function on.
4. The functions **12...15** will read and output the UID in various Byte order and number representations.  
The functions **16...19** will add the memory contents of one page to the UID.
5. Store the configuration in the RFID device with [Set Reader]



### 3.3 Capturing the UID of HF RFID tags of Standard ISO 14443A

1. As of 2022-09-13, the firmware uses 115200 Baud
2. Click on [Connect]
3. Switch the HID function on.
4. The functions **00**, **06...08** will read and output the UID in various Byte order (LSB or MSB) and number representations (hex or decimal).
5. Store the configuration in the RFID device with [Set Reader]

If you want to read data from a memory block or page, use functions **01**, **02**, **03** or **0F**.

**HID Setting V6.1**

**Function Setting** | Firmware Update

**Connectivity**

Connection: ☒ COM

ComPort: COM6 Baudrate: 115200 Address: 0 **Connect**

**Settings Dual HID Mode**

Set Reader to HID Mode ☒

Working Mode: 00: HF 14443A LSB

Memory Position: 00: HF 14443A LSB

Memory Key(if app): 01: HF Ultralight Data

Output Format: 02: HF Mifare Data

03: HF Mifare Data + UID

04: HF 15693 UID

05: HF 15693 UID + Data

06: HF 14443A MSB

07: HF 14443A LSB-DEC

08: HF 14443A MSB-DEC

09: HF 15693 MSB-DEC

0A: HF NDEF URL

0B: HF Reserved for future use

0C: HF Reserved for future use

0D: HF Reserved for future use

0E: HF Reserved for future use

0F: HF Ultralight UID + Data

10: LF Read UID LSB of read - only tag type

11: LF Read UID MSB of read - only tag type

12: LF Read UID LSB of Hitag1 / S tag type

13: LF Read UID MSB of Hitag1 / S tag type

14: LF Read UID LSB - DEC of Hitag1 / S tag type

15: LF Read UID MSB - DEC of Hitag1 / S tag type

16: LF Read UID LSB and Memory Page from Hitag1 / S tag type

17: LF Read UID MSB and Memory Page from Hitag1 / S tag type

18: LF Read UID LSB - DEC and Memory Page from Hitag1 / S tag type

19: LF Read UID MSB - DEC and Memory Page from Hitag1 / S tag type

1A: LF Read UID MSB - DEC of read - only tag type

1B: LF Read UID LSB - DEC of read - only tag type

1C: LF Reserved for future use

1D: LF Reserved for future use

**Prefix** Prefix

**Postfix** Postfix

**Protocol Screen**

**SET READER**

**SET**

**CLEAR**

### 3.4 Capturing the UID of HF RFID tags of Standard ISO 15693

1. As of 2022-09-13, the firmware uses 115200 Baud
2. Click on [Connect]
3. Switch the HID function on.
4. The functions **04**, **09**, **0C** and **0D** will read and output the UID in various Byte order and number representations. The function **05** will add the memory contents of one page to the UID.
5. Store the configuration in the RFID device with [Set Reader]

**HID Setting V6.2**

**Function Setting** | Firmware Update

**Connectivity**

Connection: ☒ COM

ComPort: COM4 Baudrate: 115200 Address: 0 **Connect**

**Settings Dual HID Mode**

Set Reader to HID Mode ☒

Working Mode: 00: HF 14443A LSB

Memory Position: 00: HF 14443A LSB

Memory Key(if app): 01: HF Ultralight Data

Output Format: 02: HF Mifare Data

HID Format: 03: HF Mifare Data + UID

**LF + HF Enable**

HF Data Format: 04: HF 15693 UID MSB

LF Data Format: 05: HF 15693 UID + Data

LF Page Address: 06: HF 14443A MSB

07: HF 14443A LSB-DEC

08: HF 14443A MSB-DEC

09: HF 15693 MSB-DEC

0A: HF NDEF URL

0B: HF Customized use

0C: HF 15693 UID LSB

0D: HF 15693 UID LSB-DEC

0E: HF Customized use

0F: HF Ultralight UID + Data

10: LF Read UID LSB of read - only tag type

11: LF Read UID MSB of read - only tag type

12: LF Read UID LSB of Hitag1 / S tag type

13: LF Read UID MSB of Hitag1 / S tag type

14: LF Read UID LSB - DEC of Hitag1 / S tag type

15: LF Read UID MSB - DEC of Hitag1 / S tag type

16: LF Read UID LSB and Memory Page from Hitag1/ S tag type

17: LF Read UID MSB and Memory Page from Hitag1/ S tag type

18: LF Read UID LSB - DEC and Memory Page from Hitag1/ S tag type

19: LF Read UID MSB - DEC and Memory Page from Hitag1/ S tag type

1A: LF Read UID MSB - DEC of read - only tag type

1B: LF Read UID LSB - DEC of read - only tag type

1C: LF Reserved for future use

1D: LF Reserved for future use

**SET READER**

Prefix: Prefix

Postfix: Postfix

**SET**

**CLEAR**

### 3.5 Read Memory Block and UID from a Mifare classic

Select an HID Mode with Mifare and Data.

Set the memory block to read from.

Choose the Key to use for authentication.

Finally configure the HID output format.

E.g see picture below

Set Reader to HID Mode ☒

Working Mode Q3: HF Mifare Data + UID

Memory Position 3D Data Position 0 Data Length 16

Memory Key(if applicable) ☒ Key A ☐ Key B Key FF FF FF FF FF FF

Output Format ☒ Number ☐ ASCII

HID Format ☐ Lowercase ☒ Uppercase

#### Example Output

0C9CF822031401000000000000035452309010055

0C9CF822 Is the 4 Bytes long UID of this tag in hexadecimal interpretation.  
031401000000000000035452309010055 Are the 16 Bytes from memory block 0x3D (#62)

### 3.6 Read Part of Memory Block and UID from a Mifare classic

Now we cut the first 4 Bytes from the memory block and limit the data to 8 Bytes.

Working Mode Q3: HF Mifare Data + UID

Memory Position 3D Data Position 4 Data Length 8

#### Example Output

0C9CF822000000000354523

0C9CF822 Is the 4 Bytes long UID of this tag in hexadecimal interpretation.  
000000000354523 Are the trimmed 8 Bytes from memory block 0x3D (#62)

### 3.7 Additional Settings of the Output Format

#### 3.7.1 Output Format

Output Format ☒ Number ☐ ASCII

With the two radiobuttons, you can select either the output as number value or the ASCII numbers.

##### Example of Mifare with 4 Bytes UID operation mode

- Hexadecimal value: 03e7fb6b
- ASCII Numbers: 3033453746423642

##### Example of Mifare with 4 Bytes UID-DEC operation mode

- Decimal value: 65534827
- ASCII numbers: 3635353334383237

#### 3.7.2 HID Format

HID Format ☒ Lowercase ☐ Uppercase

##### Example of Mifare with 4 Bytes Lowercase

- Hexadecimal value: 03e7fb6b

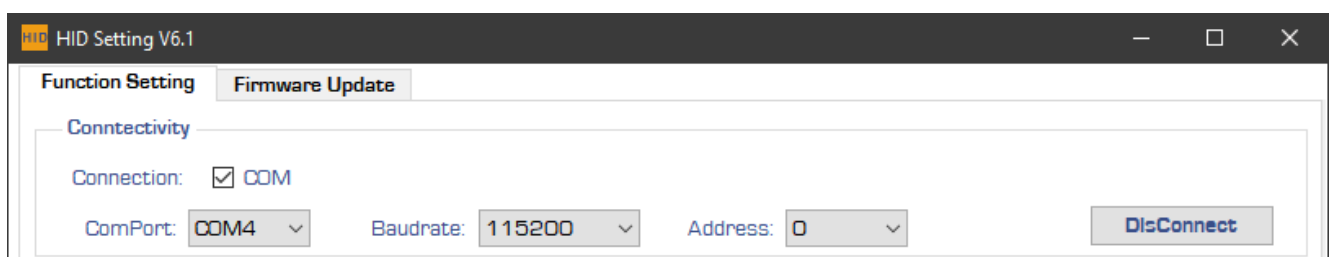
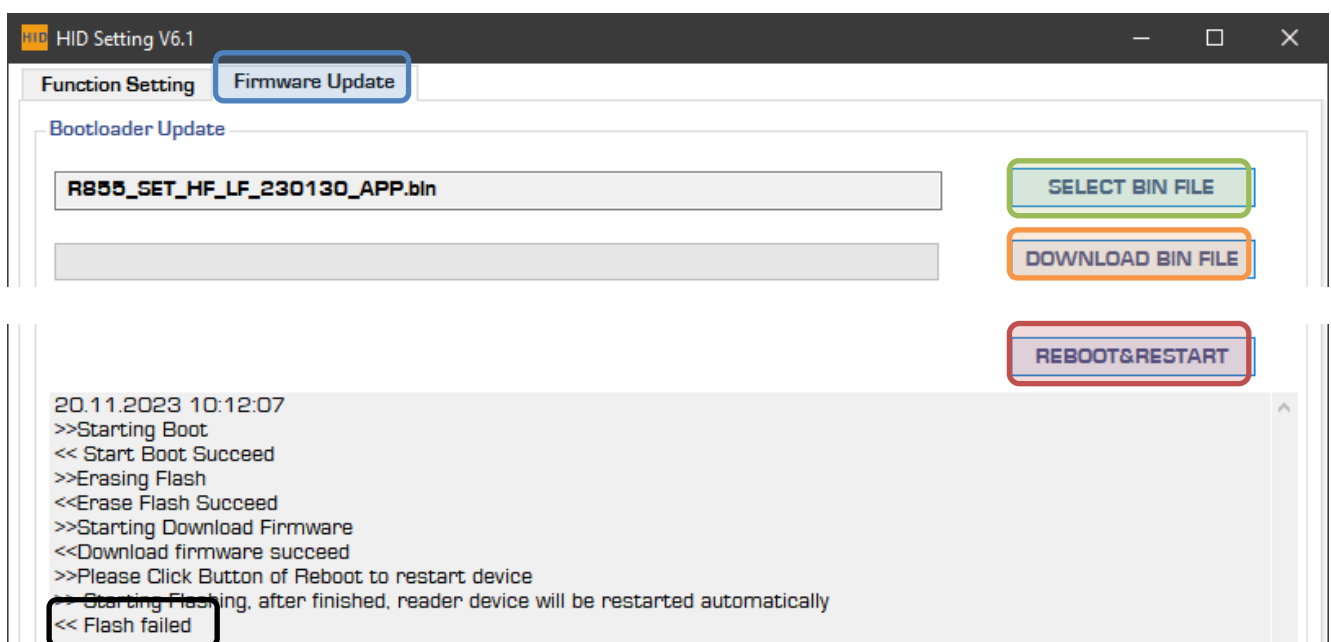
##### Example of Mifare with 4 Bytes Uppercase

- Hexadecimal value: 03E7FB6B

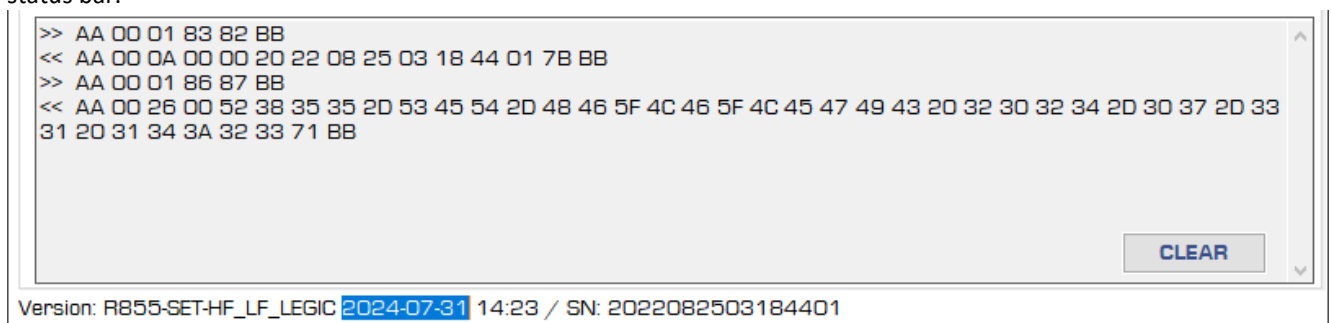
## 4 Firmware Update

As of the firmware with date info 2022-09-13 it is possible to update the firmware using this HID Setting software. Connect with the device you want to update and change to the **second tab** labelled “Firmware Update”

1. Click on [SELECT BIN FILE] will open the file selector. For your convenience, you can select the Firmware file in the explorer press and hold the [Shift] key, right-click and select “copy as path”. After this you can simply paste the path into the file input line in the file selector.
2. Start the update with click on [DOWNLOAD BIN FILE]
3. Please wait until the process is finished.
4. Click on [REBOOT&RESTART]
5. Sometimes you get the error message “Flash failed”. Please ignore this and test the device. If in doubt, do a power cycle.



Now you can change back to the tab “Function Setting” Disconnect => Connect and see the new version information in the status bar.



## 5 Glossary

HID	Human Interface Device
LSB	Least Significant Byte
MSB	Most Significant Byte

## 6 Revision History

Date	Version	Description
2023-03-03	0.3	First English draft
2023-08-03	0.4	More examples in a nutshell
2023-11-20	0.5	FW Update added
2024-08-12	0.6	Screenshots updated; Software Designation updated