

μFR Card Formatter

Version 1.0

Table of contents

About	3
Reading card	4
Writing card	5
Burst programming	6
Authentication	7
Input files	9
Revision history	10

About

D-Logic uF Card Formatter - version 1.7.2 [DLL: 3.4.3 (0)] { . }

File

Actual File: none

Data on Card:

Sector: BinS: Block:

Sect	BinS	Block	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	0	0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
0	1	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
0	2	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	0	4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	1	5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1	2	6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	0	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	1	9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
2	2	10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	0	12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	1	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3	2	14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	0	16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	1	17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4	2	18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

ASCII:

0: -----
1: -----
2: -----
4: -----
5: -----
6: -----
8: -----
9: -----
10: -----
12: -----
13: -----
14: -----
16: -----
17: -----
18: -----
20: -----

Read Card
Write Card
Burst Programming
Start
Stop
☐ Create LOG file
Clear all

Keys (sector trailers definition - 1st part):

☐ Automatic key mode (authentication keys are in reader) ☒ AKM1 ☐ AKM2 Define keys for authentication

Sector:	Blocks:	Key A [HEX]	Key A	Key B [HEX]	Key B	Byte9 value
0	0 - 3	-----	-----	-----	-----	---
1	4 - 7	-----	-----	-----	-----	---
2	8 - 11	-----	-----	-----	-----	---
3	12 - 15	-----	-----	-----	-----	---
4	16 - 19	-----	-----	-----	-----	---
5	20 - 23	-----	-----	-----	-----	---
6	24 - 27	-----	-----	-----	-----	---
7	28 - 31	-----	-----	-----	-----	---
8	32 - 35	-----	-----	-----	-----	---
9	36 - 39	-----	-----	-----	-----	---
10	40 - 43	-----	-----	-----	-----	---
11	44 - 47	-----	-----	-----	-----	---
12	48 - 51	-----	-----	-----	-----	---
13	52 - 55	-----	-----	-----	-----	---
14	56 - 59	-----	-----	-----	-----	---
15	60 - 63	-----	-----	-----	-----	---

Access Bits (sector trailers definition - 2nd part):

Sector: BinS: Block:

Sect	BinS	Block	Access bits value
0	0	0	---
0	1	1	---
0	2	2	---
0	3	3	---
1	0	4	---
1	1	5	---
1	2	6	---
1	3	7	---
2	0	8	---
2	1	9	---
2	2	10	---
2	3	11	---
3	0	12	---
3	1	13	---
3	2	14	---
3	3	15	---

µFR Card Formatter is used for programming MIFARE® Classik 1K cards. You can read and write card data, change authentication keys and access bits and save data to file. Also, burst programming option is included where you can write data to multiple cards one after another.

Application has an option to write keys into the µFR reader for AKM1 (Automatic Key Mode 1) and AKM2 (Automatic Key Mode 2) mode.

Reading card

D-Logic uF Card Formatter - version 1.7.2 [DLL: 3.4.3 (0)] { UNKNOWN READER TYPE SN: UF101171 FW v5.0.36 }

File

Actual File: none

Data on Card:

Sector: BinS: Block:

Sect	BinS	Block	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	0	0	66	AB	51	79	E5	88	04	00	C8	23	00	20	00	00	00	19
0	1	1	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0	2	2	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	0	4	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	1	5	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	2	6	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	0	8	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	1	9	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	2	10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	0	12	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	1	13	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	2	14	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	0	16	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	1	17	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	2	18	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Information

Card was successfully read.
Card SN: 0x7951AB66

OK

Access Bits (sector trailers definition - 2nd part):

Sect	BinS	Block	Access bits value
0	0	0	0
0	1	1	0
0	2	2	0
0	3	3	1
1	0	4	0
1	1	5	0
1	2	6	0
1	3	7	1
2	0	8	0
2	1	9	0
2	2	10	0
2	3	11	1
3	0	12	0
3	1	13	0
3	2	14	0
3	3	15	1

For reading card data, put card on the reader and click the 'Read Card' button. After successful reading, card data will be displayed in hexadecimal and ASCII format. Displayed card data includes:

- Value of bytes stored in data blocks
- Card keys
- Card access bits
- Card UID in message box after reading

Writing card

D-Logic uF Card Formatter - version 1.7.2 [DLL: 3.4.3 (0)] { UNKNOWN READER TYPE SN: UF101171 FW v5.0.36 }

File

Actual File: none

Data on Card:

Sector: BinS: Block:

Sect	BinS	Block	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	0	0	66	AB	51	79	E5	88	04	00	C8	23	00	20	00	00	00	19
0	1	1	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0	2	2	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	0	4	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	1	5	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	2	6	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	0	8	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	1	9	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	2	10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	0	12	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	1	13	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	2	14	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	0	16	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	1	17	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	2	18	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Information

Card was successfully written.
Card SN: 0x7951AB66

OK

Keys (sector trailers definition - 1st part):

☐ Automatic key mode (authentication keys are in reader) ☒ AKM1 ☐ AKM2 Define keys for authentication

Sector:	Blocks:	Key A [HEX]	Key A	Key B [HEX]	Key B	Byte9 value
0	0 - 3	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
1	4 - 7	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
2	8 - 11	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
3	12 - 15	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
4	16 - 19	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
5	20 - 23	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
6	24 - 27	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
7	28 - 31	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
8	32 - 35	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
9	36 - 39	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
10	40 - 43	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
11	44 - 47	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
12	48 - 51	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
13	52 - 55	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
14	56 - 59	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
15	60 - 63	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69

Access Bits (sector trailers definition - 2nd part):

Sector: BinS: Block:

Sect	BinS	Block	Access bits value
0	0	0	0
0	1	1	0
0	2	2	0
0	3	3	1
1	0	4	0
1	1	5	0
1	2	6	0
1	3	7	1
2	0	8	0
2	1	9	0
2	2	10	0
2	3	11	1
3	0	12	0
3	1	13	0
3	2	14	0
3	3	15	1

Read Card

Write Card

Burst Programming

Start

Stop

☐ Create LOG file

Clear all

For writing content into card, simply fill in the data and click the **'Write Card'** button. You can write every single byte of data blocks, card keys and change the card access bits as shown on the picture above.

After successful writing you will be able to see a message box with content:
"Card was successfully written. Card SN: 0x???????"

Burst programming

For burst programming, click the **'Start'** button. You will see a message "Connecting to the reader...", wait until it changes to "No card!". When you see the "No card!" message, you can put card on the reader and start programming.

D-Logic uF Card Formatter - version 1.7.2 [DLL: 3.4.3 (0)] { UNKNOWN READER TYPE SN: UF101171 FW v5.0.36 }

File

Actual File: none

Data on Card:

Sector: BinS: Block:

Sect	BinS	Block	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0	0	0	66	AB	51	79	E5	88	04	00	C8	23	00	20	00	00	00	19
0	1	1	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0	2	2	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	0	4	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	1	5	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1	2	6	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	0	8	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	1	9	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
2	2	10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	0	12	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	1	13	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
3	2	14	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	0	16	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	1	17	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
4	2	18	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00

ASCII:

0: f«Qyâ` 00 È# 0000
1: 00000000000000000000
2: 00000000000000000000
4: 00000000000000000000
5: 00000000000000000000
6: 00000000000000000000
8: 00000000000000000000
9: 00000000000000000000
10: 00000000000000000000
12: 00000000000000000000
13: 00000000000000000000
14: 00000000000000000000
16: 00000000000000000000
17: 00000000000000000000
18: 00000000000000000000
20: 00000000000000000000

Read Card
Write Card

Burst Programming

Start
Stop
Create LOG file
Card SN: 7951AB66
Done

Clear all

Keys (sector trailers definition - 1st part):

☐ Automatic key mode (authentication keys are in reader) ☒ AKM1 ☐ AKM2 Define keys for authentication

Sector:	Blocks:	Key A [HEX]	Key A	Key B [HEX]	Key B	Byte9 value
0	0 - 3	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
1	4 - 7	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
2	8 - 11	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
3	12 - 15	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
4	16 - 19	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
5	20 - 23	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
6	24 - 27	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
7	28 - 31	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
8	32 - 35	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
9	36 - 39	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
10	40 - 43	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
11	44 - 47	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
12	48 - 51	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
13	52 - 55	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
14	56 - 59	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69
15	60 - 63	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy	69

Access Bits (sector trailers definition - 2nd part):

Sector: BinS: Block:

Sect	BinS	Block	Access bits value
0	0	0	0
0	1	1	0
0	2	2	0
0	3	3	1
1	0	4	0
1	1	5	0
1	2	6	0
1	3	7	1
2	0	8	0
2	1	9	0
2	2	10	0
2	3	11	1
3	0	12	0
3	1	13	0
3	2	14	0
3	3	15	1

After successful programming you will see a green area with the message "Card SN: ??????? Done". After that you can put another card on the reader for programming. To stop burst programming, simply click the **'Stop'** button.

If you check the **'Create LOG file'** option, 'logs' folder will be created with txt file inside. In txt file all programmed cards will be written.

Authentication

Keys (sector trailers definition - 1st part):

☐ Automatic key mode (authentication keys are in reader) ☒ AKM1 ☐ AKM2 Define keys for authentication

Sector:	Blocks:	Key A [HEX]	Key A	Key B [HEX]	Key B	Byte9 value
0	0 - 3	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
1	4 - 7	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
2	8 - 11	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
3	12 - 15	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
4	16 - 19	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
5	20 - 23	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
6	24 - 27	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
7	28 - 31	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
8	32 - 35	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
9	36 - 39	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
10	40 - 43	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
11	44 - 47	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
12	48 - 51	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
13	52 - 55	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
14	56 - 59	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69
15	60 - 63	FFFFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFFFF	yyyyyy	69

For authentication to card, you can choose between:

- Automatic key mode (authentication keys are in reader)
- Define keys for authentication (Provided key)

For Automatic key mode you can choose between AKM1 and AKM2.

AKM1 stands for AUTOMATIC KEY MODE 1.

AKM2 stands for AUTOMATIC KEY MODE 2.

For more info about AKM1 and AKM2, please refer to:

µFR Series NFC Reader API

<https://git.d-logic.net/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR%20Series%20NFC%20reader%20API.pdf>

If you click on 'Define keys for authentication' button, this window will be open:

Authentication Keys

Sector:	Blocks:	Key A [HEX]	Key A [ASCII]	Key B [HEX]	Key B [ASCII]
0	0 - 3	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
1	4 - 7	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
2	8 - 11	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
3	12 - 15	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
4	16 - 19	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
5	20 - 23	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
6	24 - 27	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
7	28 - 31	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
8	32 - 35	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
9	36 - 39	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
10	40 - 43	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
11	44 - 47	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
12	48 - 51	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
13	52 - 55	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
14	56 - 59	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy
15	60 - 63	FFFFFFFFFFFF	yyyyyy	FFFFFFFFFFFF	yyyyyy

Copy from main window

Load from file

Set Transport Config.

Write keys in reader

Lock reader keys

Unlock reader keys

Close

Here you can define provided keys for all sectors in the card in different ways.

- You can copy keys from the main window if you click the 'Copy from main window' button.
- You can load keys from file
- Set transport configuration will set all keys to **FFFFFFFFFFFF** (hexadecimal)
- You can also write keys into reader from this table and choose write method between AKM1 and AKM2
- Also, you can lock or unlock writing keys into the reader providing 8 characters long password.

Input files

Input files example:

```
test_input_sector2.hex 321 Bytes
1 [card]
2 type=08
3
4 [trailers_byte9]
5 02: 32
6
7 [access_bits]
8 08: 0
9 09: 0
10 0A: 0
11 0B: 1
12
13 [data]
14 08: 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46
15 09: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
16 0A: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
17
18 [keys]
19 02.A: FF FF FF FF FF FF
20 02.B: FF FF FF FF FF FF
21
```

On the picture above you can see an example how to create an input file with defined keys, data blocks, access bits and sector trailer byte9 which can be loaded from software.

Revision history

Date	Version	Comment
2020-03-09	1.0	Base document