

DES CMD DATA structure

[2021/01/15]

DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	Desfire command code	Desfire command parameters	Checksum and Negate

Ex. Get Desfire card's UID command "02 05 9F 04 01 16 E4"

02 05 9F is RD300-DES1 DES Function Commands

DES CMD DATA: 04 01 16 E4

DES LEN: 0x04 (Count from 01~E4)

DES ADD: 0x01

DES FC: 0x16

DES DATA: none

DES CHECK: 0xE4 (04+01+16=1B, 1B(0001 1011) negate=E4(1110 0100))

(0x16) Activate 14443A Card and response UID

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	16	none	Checksum and Negate
04	01	16		E4

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	16	Response data	Checksum and Negate
0C	01	16	00 04 2F 8E 4A 80 4C 80	85
Response data: 00042F8E4A804C80 is card's UID.				

(0x18) Activate 14443-4 to execute combination command

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	18	none	Checksum and Negate
04	01	18		E2

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	18	Response data (ATS)	Checksum and Negate
0B	01	18	00 06 75 77 81 02 80	E6
05	01	18	02	DF
Response data: 00067577810280 is success, 02 is Fail				

(0xB0) Format card with default structure

(application ID=0x001001)

Format CMD data need send with no response command "0x9E"

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B0	Original key and New Key	Checksum and Negate
24	01	B0	00.....00 FF.....FF	3A
ex. Original key is "00000000000000000000000000000000"				
New Key is "FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF"				

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B0	Response data	Checksum and Negate
05	01	B0	00 00	49
Response data: 00 00 is success response, others are error code.				

(0xB1) Write file data to application ID "0x001001"

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B1	File ID, address, key and data	Checksum and Negate
36	01	B1	01 00 00.....00 FF.....FF	36
DES DATA[00-00]: File ID DES DATA[01-01]: Address DES DATA[02-17]: key (16 bytes) DES DATA[18-49]: Data (32 bytes)				

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B1	Response data	Checksum and Negate
00 05	01	B1	00	48
Response data: 00 is success response, others are error code. Ex. Request: 36 01 B1 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FF 36 Response: 00 05 01 B1 00 48				

(0xB3) Change key for application ID “0x001001”

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B3	Key No. , OLD key, NEW key	Checksum and Negate
25	01	B3	01 00.....00 11.....11	15
DES DATA[00-00]: Key No. (No. 01~13) DES DATA[01-16]: OLD key (16 bytes) DES DATA[17-32]: NEW key (16 bytes)				

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B3	Response data	Checksum and Negate
00 05	01	B3	00	46
Response data: 00 is success response, others are error code. Ex. Request: 25 01 B3 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 15 Response: 00 05 01 B3 00 46				

(0xB9) Select application ID

(0xB9) is combination command, need execute (0x18) command first.

Combination command: 0x18à0xB9

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B9	application ID (3 bytes)	Checksum and Negate
07	01	B9	F1 AD 00	A0

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B9	Response data	Checksum and Negate
05	01	B9	00	40

Response data: 00 is success response, others are error code.

(0xBA) Key verification

(0xBA) is combination command, need execute (0x18) command first.

Combination command: 0x18à0xB9à0xBA

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BA	Key ID and Key	Checksum and Negate
15	01	BA	01 00.....00	2E

Ex. Key ID: 01 and Key: "00000000000000000000000000000000"

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BA	Response data	Checksum and Negate
05	01	BA	00	3F

Response data: 00 is success response, others are error code.

(0xBB) Write file data

(0xBB) is combination command, need execute (0x18) command first.

Combination command: 0x18à0xB9à0xBAà0xBB

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BB	File ID, address, length and data	Checksum and Negate
18	01	BB	01 00 00 10 11.....FF AA	78
DES DATA[00-00]: File ID DES DATA[01-02]: Address DES DATA[03-03]: length (0~128) DES DATA[04-19]: Data				

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BB	Response data	Checksum and Negate
05	01	BB	00	3F
Response data: 00 is success response, others are error code. Ex. Request: 18 01 BB 01 00 00 10 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF AA 78 Response: 05 01 BB 00 3E				

(0xBC) Read file data

(0xBC) is combination command, need execute (0x18) command first.

Combination command: 0x18à0xB9à0xBAà0xBC

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BC	File ID, address and length	Checksum and Negate
08	01	BC	01 00 00 10	29
DES DATA[00-00]: File ID DES DATA[01-02]: Address DES DATA[03-03]: length (0~128)				

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BC	Response data	Checksum and Negate
?	01	BC	00 0xXX.....0xXX	?
Response data: 00 + file data is success response, others are error code. Ex. Request: 08 01 BC 01 00 00 10 29 Response: 15 01 BC 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF AA 8B				

(0xBD) Change key

(0xBD) is combination command, need execute (0x18) command first.

Combination command: 0x18à 0xB9à 0xBAà 0xBD

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BD	Key ID, parameters, new key and old key	Checksum and Negate
26	01	BD	01 EF FF.....FF 00.....00	29

Ex.

Key ID: 01

Key's permission Parameters: EF (Depends on Desfire protocol)

NEW Key: "FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF"

OLD Key: "00000000000000000000000000000000"

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	BD	Response data	Checksum and Negate
05	01	BD	00	3C

Response data: 00 is success response, others are error code.

(0xB4) Create new application

(application ID=0x00xxxx)

Request				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B4	Original key, application ID and size	Checksum and Negate
18	01	B4	00.....00 F1 AD 00 04	8C
<p>DES DATA[00-15]: Original application key DES DATA[16-17]: application ID, ex. FA AD means application ID is 0x00ADF1 DES DATA[18-19]: File size, ex. 00 04 means create 0x0400=1024 bytes file.</p> <p>Created application include a file "0x01" Read key ID is "0x01" and write key ID is "0x02"</p>				

Response				
DES LEN	ID	DES FC	DES DATA	DES CHECK
Length	01	B4	Response data	Checksum and Negate
05	01	B4	00	45
<p>Response data: 00 00 is success response, others are error code.</p> <p>Ex. Request: 18 01 B4 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 F1 AD 00 04 90 Response: 05 01 B4 00 45</p>				