Software User Manual HF Reader Testing Demo

(ISO14443A/B, MIFARE DESFire, ISO15693)

(Version 1.1)

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1. Introduction

This testing demo is offered for the basic functions available to operate read/write and other functions of the HF series Modules and Reader products designed by CHIKEK, and it supports of UART-TTL, RS232, RS485 and USB(COM) port products.

This demo is programmed basing on C# language and run under WINDOWS system.

Any other specific function not showing in this demo, can be realized by customize if there need, please contact our sales persons for details requesting.

2. Operation Features

2.1 Hardware connection

For Modules series product, please firstly refer to datasheet of the specified Module using for their PIN definition and connect them with correspond mid-ware tool when testing with PC.

For Reader product with USB COM port, just plug USB connector to the PC side.

Then please check the COM port if be recognized in PC successfully, the way to check it is: Open Computer Manager--Device Manager--COM and LPT, as below :



2.2 Software connection

Firstly double click the DEMO EXE file to open demo software, and enter into connection interface as below:

CareBart		Daudaata	115200 -	Address: 0	•		DisConnect	7
ComPort	COMI	Daudrate	115200	Address.		1		_
Baudrate	9600 👻	bps					Set Baudrate	
LED	Lighting Time	3	x50ms	No. of Times	4		Lighting	
BUZ	Beeping Time	3	x50ms	No. of Times	4		Beeping	
Address	0x00000010) 500ms!					Read Flash	
Address	0x0000008						Write Flash	
NOTE: Addr	ress as 32bit, MSB firs	et!						
ANT1	ON -	ANT2	ON 🗸	NOTE: Default antenna st	tatus is opene	d!	Get ANT Set ANT	
rotocol Sc onnect succ	reen ess							

Notes for Connectivity parameters:

Port number:	Refer to Device ManagerCOM&LPT, which on listing
Baudrate:	Default as 115200bps, available from 9600bps ~ 115200bps;
Address:	Not important

Make sure above parameters in right, then click Connect button to enter functions interface, and according response will be shown on "Protocol Screen" box.

2.3 System command

2.3.1 Set Baudrate

This function is to set according baudrate to be used in specific application. The available value is as listing and just select the right one to be set, as following show.

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.

File About	Exit						
System Aut	o-List Cards ISC	014443A-3/4 MIFA	RE Classic Ultralight/C	DESFire	ISO14443B	ISO15693	ISO781
- connectivity	У —						
Connection	USB	V Serial					
ComPort	COM1 🔻	Baudrate: 115200	Address: 0	•		DisConnect	
System					Г	ſ	
Baudrate	9600 -	bps			L	Set Baudrat	e
LED	19200	3 x50ms	No. of Times	s 4		Lighting	
BUZ	57600	3 x50ms	No. of Times	s <mark>4</mark>		Beeping	
NOTE: Ead	h cyu re unite is rixe 1 to	o 500ms!					_
Address	0x00000010					Read Flash	
Address	0x0000008				(Write Flash	
NOTE: Add	ress as 32bit, MSB firs	st!					
			_		[Get ANT	
ANT1	ON +	ANT2 ON	 NOTE: Default antenni 	a status is opene	ed!	Set ANT	
Protocol Sc	reen						_
Connect cucc >> 50 00 01	01 04 54	setup command se	nt				
<< 50 00 01	01 04 54succes	s setup	succeed response				
					ſ	Clear	
						LIEdi	

2.3.2 Set LED

This function is to set according LED's working way to be used in specific application. The available value including:

Lighting time: time length to be light, and the unit as 50ms

No. Of Times: time cycle, which means how many times to be light during whole length

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.

Connectivity Connection	USB	V Seri	al					
ComPort	COM1 -	Baudra	te: 115200 🔻	Address: 0	•		DisConnect	
System Baudrate	115200 🔻	bps					Set Baudrate	e
LED	Lighting Time	3	x50ms	No. of Times	4		Lighting	
BUZ NOTE: Each	Beeping Time	3 500ms!	x50ms	No. of Times	4		Beeping	
Address	0x00000010						Read Flash	
Address	0x0000008						Write Flash	
NOTE: Addre	ess as 32bit, MSB firs	ati						
	ON -	ANTO	ON -	NOTE: Default antenna st	etus is onen	adl	Get ANT	
ANII		ANTZ	UN T	NOTE: Delabit antenna si	utua la opern		Set ANT	
Protocol Ser > 50 00 02 0 < 50 00 00 0	900 13 03 04 56 13 53success	Comm	aand sent ▶ setup succ	eed response				

2.3.3 Set BUZ

This function is to set according buzzer's working way to be used in specific application. The available value including:

Beeping time: time length to be beeping, and the unit as 50ms

No. Of Times: time cycle, which means how many times to be beeping during whole length

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.

Connectivity	o-List Cards ISC)14443A-3/	4 MIFARE (Classic Ultralight/C	DESFire	ISO14443B	ISO15693	ISO/81
Connection ComPort	USB	Serial Baudrate	e: 115200 🔻	Address: 0	•	[DisConnect	
System								
Baudrate	115200 -	bps					Set Baudrate	
LED	Lighting Time	3	x50ms	No. of Times	4		Lighting	
BUZ	Beeping Time	3	x50ms	No. of Times	4		Beeping	
NOTE: Eac	h cycle time is fixed to	500ms!						
Address	0x00000010					[Read Flash	
Address	0x0000008					[Write Flash	
NOTE: Addr	ess as 32bit. MSB firs	at!						
						ſ	Get ANT	
ANT1	ON -	ANT2	ON -	NOTE: Default antenna st	tatus is openeo	"	Set ANT	
						L.		
	reen							1
Protocol Sc >> 50 00 02 (02 03 04 57							
Protocol Sc >> 50 00 02 (<< 50 00 00 (02 03 04 57)2 52success							
Protocol Sc >> 50 00 02 (<< 50 00 00 (02 03 04 57 02 52success							
Protocol Sc >> 50 00 02 (<< 50 00 00 (02 03 04 57 02 52success							
Protocol Sc >> 50 00 02 (<< 50 00 00 (02 03 04 57 02 52success							
Protocol Sc >> 50 00 02 (<< 50 00 00 (02 03 04 57 02 52success							

2.3.4 Set ANT

This function is to set which antenna to be ON or OFF when there are two antennas.

(Note: The antenna's default status is opened, and please refer to detail commands to do setup based on the Communication Protocol document for different product, or contact our technician for support)

And in the Box of Protocol Screen, there will be showing according setup command and right succeed response.

Connection		Serial	nppy 🖌 🖌 00	ess: 0	•	ĺ	DisConnect	
System								
Baudrate	115200 -	bps					Set Baudrate	•
LED	Lighting Time	3 x50ms	N	o. of Times	4		Lighting	
BUZ	Beeping Time	3 x50ms	N	o. o <mark>f Tim</mark> es	4		Beeping	
NOTE: Eacl	h cycle time is fixed to	500ms!						_
Address	0x00000010						Read Flash	
Address	0x0000008					(Write Flash	
NOTE: Adda	ess as 32hit, MSB first	H.						_
		Same Contract				. (Get ANT	
ANT1	ON 🗸	ANT2 ON		fault antenna sta	atus is openeo	"	Set ANT	
Protocol Sci > 50 00 00 0 < 50 00 01 0	een)B 5B)B 03 59success							

This product uses an embedded PCB antenna, which is not removable and has a maximum antenna gain of 0.0dbi.

2.4 Auto-List Card

This TAB is available to do Read all cards under 13.56MHz frequency automatically, and the function can be configured Protocol standard and Reading speed as following shown, the cards information will be listing on Card Listing box:

Demo	×
File About Exit	
System Auto-List Cards ISO14443A-3/4 MIFARE Classic	Ultralight/C DESFire ISO14443B ISO15693 ISO7816
Configure Auto-List	
☑ ISO14443 A	
V ISO14443 B	Protocol standard to be selected
✓ ISO15693	
All Types (NOTE: This option is to support all cards standards)	
Reading speed 445ms	Reading speed to Start Auto-list
U	be set
100ms 1	1000ms Stop Auto-List
Cards Listing	
-	
One card be detected:	
ISO14443A standard UID:0B64105B Card Type:0400 SAK:08	
2018/10/10 17:12:46	
One card be detected:	
UID:5CD17524000104E0	
2010/10/10 17:12:46	
	E
	Class
	Clear

2.5 ISO14443A-3/4

The interface is to enable ISO14443A-3 standard cards to enter into ISO14443A-4 standard and as a contactless CPU card.

2.5.1 Request card

The optional button including as below: Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

🔊 Demo	Backing and the		-	-			
File About Exit							
System Auto-List Cards	s ISO14443A-3/4	MIFARE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	ISO7816
Card Info							
Tag Type 44	400					Active-IDLE	
SAK 2	0					Active-ALL	
UID number 04	4461F7A662180					ACTIVE ALL	
Г ISO14443А-4 ———							
						Send RATS	
0	084000008					Send APDU	
0,	A000084000008				F	APDU Channe	
Protocol Screen			-				
>> 50 00 02 22 10 26 46 << 50 00 0B 22 44 00 20	07 04 46 1F 7A 66 2	1 80 FAsuccess					~
			-				
						Clear	
						0.50	*

2.5.2 Send RATS

RATS= Request for Answer to Select

This function is to make the card quit from ISO14443A-3 enter into 14443A-4 standard, and the data returned after Send RATS, it includes the information of the testing card's.

And the response to RATS is the "Answer to Select" ATS, and the ATS consists of specified bytes for communicate between PICC capabilities and PCD. Details specific byte's meaning, please refer to datasheet of using card.

🔂 Demo		
File About Exit		
System Auto-List Ca	rds ISO14443A-3/4 MIFARE Classic Ultralight/C DESFir	e ISO14443B ISO15693 ISO7816
Card Info		
Tag Tugo	4400	
Tag Type	20	Active-IDLE
SAK	20	Active-ALL
UID number	04461F7A662180	
150144424 4		
- ISU 14443A-4		
	0C75778002C1052F2F0035C7	Send RATS
	0084000008	Send APDU
	0A000084000008	APDU Channel
Protocol Screen		
>> 50 00 02 22 10 26 << 50 00 0B 22 44 00	46 20 07 04 46 1F 7A 66 21 80 FAsuccess	*
>> 50 00 00 2A 7A	77 80 02 C1 05 25 25 00 35 C7 CC success	
< 50 00 0C 2A 0C 75	11 00 02 C1 05 21 21 00 35 C7 CC Success	
		Clear +

2.5.3 Send APDU

This function button is a channel opened for the APDU commands, which according to different compatible commands for different cards, and please refer to them based on the cards' datasheet.

Demo	ADDED INVESTIG AND ADDED IN ADDED	
System Auto-List Ca	ards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire	ISO14443B ISO15693 ISO7816
Card Info		
Tag Type	4400	Active-IDLE
SAK	20	Active-ALL
UID number	04461F7A662180	
LISO14443A-4		
	0C75778002C1052F2F0035C7	Send RATS
	0084000008	Send APDU
	0A000084000008	APDU Channel
>> 50 00 02 22 10 26 << 50 00 0B 22 44 00 >> 50 00 00 2A 7A << 50 00 0C 2A 0C 74 >> 50 00 05 2C 00 84 << 50 00 01 2C 0B 76	46 20 07 04 46 1F 7A 66 21 80 FAsuccess 5 77 80 02 C1 05 2F 2F 00 35 C7 CCsuccess 00 00 08 F5 5success	Clear
		*

2.5.4 APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

File About Exit								
System Auto-List Ca	irds	ISO14443A-3/4	MIFARE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	ISO78
Card Info								
Tag Type	4400						Active-IDI F	
SAK	20						Active-ALL	
UID number	0446	1F7A662180						
	0084	000008					Send APDU	
-	0084	000008					Send APDU	
	0A00	0084000008					APDU Channe	1
								_
Protocol Screen	10							
>> 50 00 02 22 10 26 << 50 00 0B 22 44 00	46 20 07	04 46 1F 7A 66 2	1 80 FAsuccess					
>> 50 00 00 2A 7A	77 80	02 C1 05 2E 2E (0 35 C7 CCsucc	229				
>> 50 00 05 2C 00 84	00 00	08 F5						
<< 50 00 01 2C 0B 76 >> 50 00 07 2E 0A 00	suc 00 84	cess 00 00 08 FF						
<< F0 00 01 2E E0 3F	fail	ure						

Details commands please refer to ISO14443A-4 Standard .

2.6 MIFARE Classic

This Interface is opened all available data operations specially for the MIFARE Classic series cards, including card type of MIFARE Classic 1K, MIFARE Classic 4K, etc,

The function is enable to get card details information, read and write block data, key authenticate, also the E-wallet, etc.

Clear

2.6.1 MIFARE Classic- Request card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

When succeeded request card, the card's details information including card type, SAK, UID number, memory sizes, etc will be shown as below:

Demo File About Exit	And the second of the second second	
System Auto-List C	ards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire	ISO14443B ISO15693 ISO7816
Card Info		
Tag Type	0400 SAK 08	
UID number	0B64105B	
Memory Size	1 k	
Block Size	16 Bytes	Active IDLE
Number of Blocks	64 Blocks	
Number of Sectors	16 Sectors	Active-ALL
APDU	0A000084000008	APDU Channel
Card UID UB64 Block Addr 5	▼ Key Type KEYA ▼ Key FFFFFFFFFFF	Authenticate Read Block Write Block Read All Blocks
NOTE: Except for the f	unction "Read All Block", all commands must Authenticate Firstly !	E-Wallet
Protocol Screen		
>> 50 00 02 22 10 2 << 50 00 08 22 04 0	6 46 0 08 04 0B 64 10 5B 56success	

2.6.2 MIFARE Classic-APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands please refer to ISO14443A-3 Standard .

N Demo	-		-	-			
File About Exit							
System Auto-List Ca	ards ISO14443A-	3/4 MIFARE CI	assic Ultralight/C	DESFire	ISO14443B	ISO15693	ISO7816
_ Card Info							
Tag Type	SAK						
UID number							
Memory Size							
Block Size						Active-IDLE	
Number of Blocks						Active-ALL	
Number of Sectors			1				
APDU	0A000084000008						1
Block Addr 5	▼ Key Type	KEYA 🗸 Key	FFFFFFFFFF		I I I I I I I I I I I I I I I I I I I	Authenticate Read Block Write Block Read All Block	s
NOTE: Except for the fu	nction "Read All Block"	, all commands must	Autnenticate Firstiy !			E-Wallet	
Protocol Screen							
						Clear	*

2.6.3 MIFARE Classic- Key Authenticate

This is to use according KEY to authenticate for any specific Block address, Key Type and Key value. Please select the according parameter need to be used.

System Auto-List C	ards ISO	14443A-3/4	MIFARE Class	sic Ultralight/C	DESFire	ISO14443B	ISO15693	IS0781
Card Info								
Tag Type	0400	SAK 08						
UID number	0B64105B							
Memory Size	1 k							
Block Size	16 Bytes						Active IDLE	
Number of Blocks	64 Blocks						ACLIVE-IDEL	3
Number of Sectors	16 Sectors						Active-ALL	
APDU	0A0000840	80000					APDU Channe	
					-		an Charles -	
							Read Block Write Block	
NOTE: Except for the f	function "Read	All Block*, all	commands must Au	thenticate Firstly !		F	Read Block Write Block Read All Blocks	
NOTE: Except for the f	function "Read	All Block*, all	commands must Au	thenticate Firstly !			Read Block Write Block Read All Blocks E-Wallet	
NOTE: Except for the f	unction *Read	All Block*, all	commands must Au	thenticate Firstly !		F	Read Block Write Block Read All Blocks E-Wallet	
NOTE: Except for the f Protocol Screen >> 50 00 02 22 10 2 << 50 00 08 22 04 0 >> 50 00 0C 16 60 0 << 50 00 00 16 46	function *Read 6 46 0 08 04 0B 6 5 0B 64 10 -success	<i>All Block*, all</i> 54 10 5B 56 5B FF FF FF	success FFFFF0B	thenticate Firstly !		F	Read Block Write Block Read All Blocks E-Wallet	

Note:

1. The default Key value for a new MIFARE Classic 1K/4K card is FFFFFFFFFFFFFFF when there is no change of *it*

2. Before each authenticate, it must to do Active card firstly and make sure without any remove card from antenna field.

2.6.4 MIFARE Classic-Read Block

To get to read out the data stored in the according block address.

The parameters need to be selected including:

Block Addr: which block address to be read

Key Type: optional as KEYA or KEYB

Key: password of selected block (default value is FFFFFFFFFFFFFFFF for new card)

After Read Block, the data will be shown on the left side box also on Protocol Screen message box as below:

File About Exit		
System Auto-List C	ards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire	ISO14443B ISO15693 ISO7816
Card Info		
Tag Type	0400 SAK 08	
UID number	0B64105B	
Memory Size	1 k	
Block Size	16 Bytes	Active-IDI F
Number of Blocks	64 Blocks	
Number of Sectors	16 Sectors	Active-ALL
APDU	0A000084000008	APDU Channel
Card UID 0B64 Block Addr 5 000000000000000000000000000000000000	 105B Key Type KEYA ▼ Key FFFFFFFFFF 00000000000000000 data read out from selected 	Authenticate
Card UID 0B64 BlockAddr 5 000000000000000000000000000000000000	105B ▼ Key Type KEYA ▼ Key FFFFFFFFFF 000000000000000000000000000	Authenticate block Read Block Write Block Read All Blocks
Card UID 0B64 Block Addr 5 000000000000000000000000000000000000	105B ★ Key Type KEYA ★ Key FFFFFFFFFF 000000000000000000000000000	Authenticate block Read Block Write Block Read All Blocks E-Wallet
Card UID 0B64 Block Addr 5 000000000000000000000000000000000000	* Key Type KEYA Key FFFFFFFFFF 0000000000000000000000000000000000	Authenticate block Read Block Write Block Read All Blocks E-Wallet
Card UID 0B64 BlockAddr 5 000000000000000000000000000000000000	105B Key Type KEYA • Key FFFFFFFFFF 00000000000000000 data read out from selected unction "Read All Block", all commands must Authenticate Firstly! 6 46 0 08 04 0B 64 10 5B 56success 5 0B 64 10 5B FF FF FF FF FF 0B -success 3 0 00 00 00 00 00 00 00 00 00 00 00 00 0	Authenticate block Read Block Write Block Read All Blocks E-Wallet

Note:

1) Before Read Block, it must do Active card-->Authenticate firstly

2) Please input the right Key value for the card which changed before

2.6.5 MIFARE Classic-Write Block

This function button is for writing data into according requested block, also for password changing operation, detail operations please refer to datasheet of MIFARE Classic cards

The parameters need to be selected including:

Block Addr: which block address to be written

Key Type: optional as KEYA or KEYB

Data length: 16bytes

Auto List C	orde ISO14443A.3/4 MIFARE Classic Littralight/C DESEiro ISO14443	B 19016693 19078
Card Info	ands 13014443A-374 Will Arc Classic Ultranghice DESFile 13014443	B 13013633 13076
Tag Type	0400 SAK 08	
UID number	0B64105B	
Memory Size	1 k	
Block Size	16 Bytes	
Number of Blocks	64 Blocks	Active-IDLE
Number of Sectors	16 Sectors	Active-ALL
APDU	0A000084000008	APDU Channel
000000000000000000000000000000000000000	0000000011223344	Write Block
NOTE: Except for the fu	nction "Read All Block", all commands must Authenticate Firstly !	Read All Blocks
		E-Wallet
Protocol Screen		
<pre><< 50 00 08 22 04 00 >> 50 00 0C 16 60 0 << 50 00 00 16 46 >> 50 00 01 17 05 43 << 50 00 10 17 00 00 >> 50 00 12 18 05 00 << 50 00 01 18 48 </pre>	0 8 04 0B 64 10 5B 56success 5 0B 64 10 5B FF FF FF FF FF 0B success 0 00 00 00 00 00 00 00 00 00 00 00 00 0	. III

Note:

- 1) Before Write Block, it must do Active card-->Authenticate firstly
- 2) Please input the right Key value for the card which changed before
- 3) Please input right data length to be written
- 4) For password writing operation, pls refer to using card's datasheet for more details

2.6.6 MIFARE Classic-Read All Blocks

This is to get read out all blocks data in one time.

Before enter into Read All Blocks interface, it must do Active card firstly, but no need to do Authenticate. After entered Read All Blocks, please input right key value and Key Type to do Read, when succeed reading, all data information will be listing as each sector with each 4 blocks as following:

Demo	S Read All Blocks			■ - □ ×
File About System Aut	UID	0B64105B	Pay attention if the key used and key type	93 ISO7816
Taç UID nı	Default Key Key Type	FFFFFFFFFF KEYA -		
Memo	Memory Info Data Output is i	n Hexadecimal numbers	Read All Blocks	
Number of f Number of S	Sector:00 0B 64 10 5B 24 00 00 00 00 00 00 00 00 00 00 00 00 00	08 04 00 62 63 64 65 66 67 68 69 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Data information shown as each sector with each 4 block	LL s annel
- MIFARE 1K&4	Sector:01 00 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00 00 00 00 00 00	in this box	
Block Addr 000000000 000000000	Sector:02 00 00 00 00 00 00 00 00 00 00 00 00 00	00 FF 07 80 63 FF		ock
NOTE: Excep	Sector:03 00 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00 00 00 00 00 00		locks et
<pre><< 50 00 00 >> 50 00 01 << 50 00 10 >> 50 00 12 << 50 00 01 >> 50 00 01 >> 50 00 12 << 50 00 01 << 50 00 01 <<< 50 00 10 </pre>	Protocol Screen 00 00 00 00 00 00 00 00 00 00 00 00 00 00	0 00 00 00 00 00 00 00 00 00 00 00 00 0 00 0	00 00 00 00 00 00 00 00 00 00 00 00 00	E
	00 00 00 00 00 00 FF FF FF FF FF 76	0 00 00 00 00 00 00 00 00 00 00 00 00 success	00 00 00 00 00 FF 07 80 69 FF FF	

Note: When there are some sectors or blocks' key differed from others default key, their data will be failed to be read.

2.6.7 MIFARE Classic-E-wallet

This interface is available to do value operations directly for E-wallet function, please do according right setup for the values as below.

Nomo Demo	100.00 mm			– – X
File About Exit				
System Auto-List Ca	ards ISO14443A-3/4	MIFARE Classic Ultr	alight/C DESFire ISO	14443B ISO15693 ISO7816
- Card Info				
Tag Type	0400 SAK 08			
UID numb	E-Wallet			
Memory S				
Block Si Number of Bloc	Initialize Value	64000000	Initialize	Active-IDLE
Number of Secto	Increase Value	0100000	Increase	Active-ALL
APD	Decrease Value	0100000	Decrease	APDU Channel
- MIFARE 1K&4K -	BackUp To	6 🗸	BackUp	
Card UID 0				
Block Addr 5				Authenticate
00000000000	Balance		Read Value	Read Block
00000000000				Write Block
NOTE: Except for	rotocol Screen			Read All Blocks
				E-Wallet
Protocol Screen				
<< 50 00 00 16 4				*
<< 50 00 10 17 0			Clear	-
< 50 00 12 18 0	success			
>> 50 00 01 17 05 43		0 00 00 00 11 22 33 57	SUCCESS	H
				Clear +

2.7 Ultralight/C

2.7.1 Ultralight/C-Active/Request Card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

When succeeded request card, the card's details information including card type, SAK, UID number, memory sizes, etc will be shown as below:

Demo File About Exit						
System Auto-List Car	rds ISO14443	A-3/4 MIFARE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693 ISO781
Card Info						
Tag Type	4400 SA	< 00				
UID number	043E40BADA25	80			-	
Memory Size						Active-IDLE
Page Size						ACUVENDEL
Number of Pages						Active-ALL
APDU	0A00008400000	8				APDU Channel
Ultralight/C						
3	49464D4B4146	5242214E4143554E5046		_	ſ	Authoritopto
KEY	+3+3+0+0+1+3	52422142414555415540				Authenticate
New KEY	0011223344556	6778899AABBCCDDEEFF				Change Key
PAGE ADDR	5 🔹					Read Page
		-		-	ſ	Write Page
NOTE: For Ult	relight C and compa	tible cerds you have to Authent	iceta firetlu l			
NOTE. FOI DIA	rangin o ano compa	uole cards, you have to Autoent	icale in suy :			
Protocol Screen			_			
>> 50 00 02 22 10 26		A DA 25 90 95 autoasa				*
<< 50 00 0B 22 44 00	00 07 04 SE 40 E	A DA 25 60 65 Success				
						Clear -

2.7.2 Ultralight/C--APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands	please refer to I	SO14443A-4 Standard
------------------	-------------------	---------------------

ystem	Auto-List Ca	rds	ISO144	143A-3/4	MIFARE	Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	ISO781
Card Int	fo	_	_								
	Tag Type			SAK							
	UID number										
1	Memory Size								ſ	Active-IDLE	
NUMBER	Page Size	_							ſ	Active-ALL	
Num	ADDU	0.0.0	0000400	0000					ſ	APDI I Chann	al
	APDU	UAU	0008400	0008					l	A DO Chain	ei
Jitralig	ht/C										
		191	54D4B4	14552422	1/1=/1/356	1E59/6			ſ	Authenticate	
	KEY	434		FF667700					l	Admenticate	<u>. </u>
	New KEY	001	1223344	55667788	99AABBC	CDDEEFF			l	Change Key	'
	PAGE ADDR	5	43	-					[Read Page	
				-					ſ	Write Page	
	NOTE: For Ult	reliah	t C and co	mostible cs	rde vou bau	e to Authenti	cata firstlu l				
	NOTE. FOR OR	rangna	10 610 60		nus, you nav	o to Autona	colo maly :				
rotoco	I Screen										
											*

2.7.3 Ultralight C Authenticate

This is only opened for Ultralight C and its compatible cards which with password protected.

The common MIFARE Ultralight card/tag is without password protected and no need to do it.

Please input right KEY value to do authenticate for the card

Card Info Tag Type 4400 SAK 00 UID number 043E40BADA2580 Active-IDLE Memory Size Active-IDLE Page Size Active-ALL Number of Pages Active-ALL APDU 0A000084000008 APDU Chann Ultralight/C KEY 49454D4B41455242214E4143554F5946 Authenticate New KEY 00112233445566778899AABBCCDDEEFF Change Key PAGE ADDR 5 Read Page Write Page Write Page Write Page	Active-IDLE Active-ALL APDU Channel Authenticate
Tag Type 4400 SAK 00 UID number 043E40BADA2580 Memory Size Active-IDLE Page Size Active-ALL Number of Pages Active-ALL APDU 0A000084000008 Ultralight/C	Active-IDLE Active-ALL APDU Channel Authenticate
UID number 043E40BADA2580 Memory Size Active-IDLE Page Size Active-ALL APDU 0A000084000008 UItralight/C KEY 49454D4B41455242214E4143554F5946 New KEY 00112233445566778899AABBCCDDEEFF Change Key PAGE ADDR 5 Read Page Write Page	Active-IDLE Active-ALL APDU Channel Authenticate
Memory Size Page Size Number of Pages APDU 0A000084000008 APDU Channe Ultralight/C KEY 49454D4B41455242214E4143554F5946 New KEY 00112233445566778899AABBCCDDEEFF PAGE ADDR 5 Write Page Write Page	Active-IDLE Active-ALL APDU Channel Authenticate
Page Size Active-IDLE Number of Pages Active-ALL APDU 0A000084000008 Ultralight/C APDU KEY 49454D4B41455242214E4143554F5946 New KEY 00112233445566778899AABBCCDDEEFF PAGE ADDR 5 F Read Page Write Page	Active-IDLE Active-ALL APDU Channel Authenticate
Number of Pages Active-ALL APDU 0A000084000008 Ultralight/C 49454D4B41455242214E4143554F5946 KEY 49454D4B41455242214E4143554F5946 New KEY 00112233445566778899AABBCCDDEEFF PAGE ADDR 5 Virte Page	Active-ALL APDU Channel Authenticate Change Kay
APDU 0A000084000008 Ultralight/C KEY 49454D4B41455242214E4143554F5946 Authenticate New KEY 00112233445566778899AABBCCDDEEFF Change Key PAGE ADDR 5 • Write Page Write Page	APDU Channel Authenticate Change Kay
Ultralight/C	Authenticate
Ultralight/C KEY 49454D4B41455242214E4143554F5946 New KEY 00112233445566778899AABBCCDDEEFF PAGE ADDR 5 Write Page	Authenticate
KEY 49454D4B41455242214E4143554F5946 Authenticate New KEY 00112233445566778899AABBCCDDEEFF Change Key PAGE ADDR 5 Read Page Write Page Write Page	Authenticate
New KEY 00112233445566778899AABBCCDDEEFF Change Key PAGE ADDR 5 Read Page Write Page Write Page	- Change Key
PAGE ADDR 5 - Read Page Write Page	Change Rey
Write Page	Read Page
	Write Page
NOTE: For Ultralight C and compatible cards, you have to Authenticate firstly !	ticate firstly !
Protocol Screen	

2.7.4 Ultralight C Change Key

This is only opened for Ultralight C and its compatible cards which with password protected.

And please do Authenticate with old KEY <u>before</u> Change Key.

The data length for the KEY value is 16bytes.

System	Auto-List Ca	rds	ISO14443A	-3/4 MII	ARE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	IS0781
Card In	fo									
	Tag Type	4400	SAK	00						
	UID number	043E	40BADA258	80						
	Memory Size									
	Page Size]					Active-IDLE	
Num	ber of Pages			1					Active-ALL	
	APDU	0A00	008400008						APDU Channe	el
liltralia	ht/C									
olualig		_							(
	KEY	4945	54D4B41455	242214E4	43554F5946				Authenticate	
	New KEY	0011	2233445566	778899AA	BBCCDDEEFF	-		[Change Key	
	PAGEADDR	5						[Read Page	
				_				1	Write Page	
	NOTE: For Ult	ralight	C and compati	hle cards w	w have to Authen	ticate firstly I				
		- dright	o and company			in the second				
Protoco	ol Screen									
>> 50 0	0 02 22 10 26	46	04 3E 40 B	DA 25 80	85 5000000					*
50 0	0 00 22 44 00	00 01	04 JL 40 D/	10423 00	03 30000033					
								1	Class	

2.7.5 Ultralight /C Read Page

To get to read out the data stored in the according page address.

And For MIFARE Ultralight C and its compatible cards, And NTAG 2xx series card

before Read Page, Authenticate is needed firstly and make sure no remove of card after Active card. If there any remove, please again as Active-IDLE/Active-ALL --> Authenticate then Read Page with optional Page Address, as below:

Demo File About Exit ISO14443A-3/4 Ultralight/C ISO15693 ISO7816 System Auto-List Cards MIFARE Classic DESFire ISO14443B Card Info 4400 SAK 00 Tag Type 043E40BADA2580 UID number Memory Size Active-IDLE Page Size Active-ALL Number of Pages APDU Channel APDU 0A000084000008 Ultralight/C . 49454D4B41455242214E4143554F5946 Authenticate KEY 00112233445566778899AABBCCDDEEFF Change Key New KEY PAGEADDR 5 -Read Page * Write Page 6 NOTE: For Ultr 8 patible cards, you have to Authenticate firstly ! 9 A **Protocol Screen** В >> 50 00 02 22 10 26 4 C << 50 00 0B 22 44 00 (D BA DA 25 80 85 --- success E F 10 11 12 13 14 15 16 Clear 17 18 19

For common MIFARE Ultralight card, Authenticate is no need.

2.7.6 Ultralight /C Write Page

To Write the requested data into the according page address.

And For MIFARE Ultralight C and its compatible cards, And NTAG 2xx series card

Before Write Page, Authenticate is needed firstly and make sure no remove of card after Active card. If there any remove, please again as Active-IDLE/Active-ALL --> Authenticate then Write Page to optional Page Address, as below:

X Demo File About Exit System Auto-List Cards ISO14443A-3/4 Ultralight/C ISO15693 ISO7816 MIFARE Classic DESFire ISO14443B Card Info 4400 SAK 00 Tag Type 043E40BADA2580 UID number Memory Size Active-IDLE Page Size Active-ALL Number of Pages APDU Channel APDU 0A000084000008 Ultralight/C . 49454D4B41455242214E4143554F5946 Authenticate KEY 00112233445566778899AABBCCDDEEFF Change Key New KEY Read Page PAGEADDR 5 -* Write Page 6 NOTE: For Ultr 8 E patible cards, you have to Authenticate firstly ! 9 A **Protocol Screen** В >> 50 00 02 22 10 26 4 C << 50 00 0B 22 44 00 (D BA DA 25 80 85 --- success F F 10 11 12 13 14 15 16 Clear 17 18 19

For common MIFARE Ultralight card, Authenticate is no need.

Note: Some specific page cannot be written please refer to datasheet of using card/tag.

2.8 **DESFire Interface**

2.8.1 Active DESFire card

The optional button including as below:

Active-IDLE: to request the cards not dormant

Active-ALL: Request cards including dormant cards

When succeeded request card, the card's detail information including card type, SAK, UID number will be shown as below:

System Auto-List Ca	ards ISO14443A	-3/4 MIFARE Classic Ultralight/C DESFire ISO14	4443B ISO15693 ISO781
Card/Sys Command			
Tag Type	4403 SAK	20	Active-IDLE
UID number	046C86FA3C4B8	0	Active-ALL
ATS			RATS
Version			Get Version
KEY Commands			
Key Version			Get Key Version
Key Number	00	KEY 000000000000000000000000000000000000	Authenticate
Key Setting			Get Key Setting
New Key Setting			Change Key Setting
Key Number		Key Setting 00	
Original Key	000000000000000000000000000000000000000	Change Key	
New Key	00112233445566	778899AABBCCDDEEFF	
Card Level			PICC Level
NOTE: Please cl	ick right side button fo	r further detail operation!	Application Level
1			. ppilodition corton
Protocol Screen	46		
<< 50 00 0B 22 44 03	20 07 04 6C 86 FA	3C 4B 80 FAsuccess	

2.8.2 DESFire Card-RATS

RATS= Request for Answer to Select

And the response to RATS is the "Answer to Select" ATS, and the ATS consists of specified bytes for communicate between PICC capabilities and PCD. Details specific byte's meaning, please refer to datasheet of using card.

Netom Auto List Ca	rde US014443A 3/4 MIEARE Classic Littralight/C DESEire	ISO14443B ISO15693 ISO78
Cood/Cup Command	IN ARE Classic Ollianghuc Decrine	130144430 13013033 13010
Tag Type	4403 SAK 20	Active-IDLE
UID number	046C86FA3C4B80	Active-ALL
ATS	067577810280	RATS
Version		Get Version
KEY Commands		
Key Version		Get Key Version
Key Number	00 KEY 000000000000000000000000000000000	Authenticate
Key Setting		Get Key Setting
New Key Setting		Change Key Setting
Key Number	Key Setting 00	
Original Key	000000000000000000000000000000000000000	Change Key
New Key	00112233445566778899AABBCCDDEEFF	
Card Level		
Cara Lever		PICC Level
NOTE: Please cl	ick right side button for further detail operation!	Application Level
Protocol Screen		
>> 50 00 02 22 10 26	46 20.07.04.6C 86 EA 3C 4B 80 EA	
>> 50 00 00 22 44 03	77 81 02 80 7B success	
< 50 00 00 ZA 00 75	11 01 02 00 1D SUCCESS	
		Clear

Note: Before RATS, Active-IDLE/Active-ALL is needed firstly.

2.8.3 DESFire Card-Get Version

То	aet	the	retu	rned	manu	ufactu	uring	related	data	of	the	DESF	ire	cards
-	J				-					-		-	-	

Demo File About Exit		
System Auto-List Ca	ards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire ISO14	443B ISO15693 ISO7810
Card/Sys Command Tag Type UID number ATS Version	4403 SAK 20 046C86FA3C4B80 067577810280 04010100180504010101041805046C86FA3C4B80BA7418B3A00816	Active-IDLE Active-ALL RATS Get Version
KEY Commands		
Key Version Key Number	00 KEY 000000000000000000000000000000000	Get Key Version Authenticate
Key Setting New Key Setting		Get Key Setting Change Key Setting
Key Number Original Key New Key	Key Setting 00 000000000000000000000000000000000000	Change Key
Card Level	lick right side button for further detail operation!	PICC Level Application Level
Protocol Screen << 50 00 0B 22 44 03	20 07 04 6C 86 FA 3C 4B 80 FAsuccess 77 81 02 80 7Bsuccess 1 01 01 00 18 05 04 01 01 01 04 18 05 04 6C 86 FA 3C 4B 80 BA 74 18 B3 A0 0	8 16 FBsuccess

Note: Active-IDLE/Active-ALL-->>RATS is needed before Get Version.

2.8.4 DESFire Card-Get Key Version

The Get Key Version command allows to read out the current key version of any key stored on the card.

Operation procedure: Active-IDLE/Active-ALL -->> RATS -->> Get Key Version

ards ISO1444	A-3/4 MIFARE Classic Ultralight/C DESFire ISO14	443B ISO15693 ISO76	
Tag Type 4403 SAK 20			
UID number 046C86FA3C4B80			
067577810280		RATS	
040101010018	0504010101041805046C86FA3C4B80BA7418B3A00816	Get Version	
00		Get Key Version	
00	KEY 000000000000000000000000000000000000	Authenticate	
		Get Key Setting	
		Change Key Setting	
	Key Setting 00		
000000000000000	Change Key		
001122334455			
		PICC Level	
ick right side buttor	for further detail operation!	Application Level	
77 81 02 80 7B	success 04 01 01 01 04 18 05 04 6C 86 FA 3C 4B 80 BA 74 18 B3 A0 0	8 16 FBsuccess	
	ards ISO14443 4403 SA 046C86FA3C4E 067577810280 0401010100180 00 00 00 00 00 00 00 00 00 00 00 00 0	ards ISO14443A-3/4 MIFARE Classic Ultralight/C DESFire ISO14 4403 SAK 20 046C86FA3C4B80 067577810280 0401010100180504010101041805046C86FA3C4B80BA7418B3A00816 00 00 KEY 000000000000000000000000000000000000	

2.8.5 DESFire Card- Key Authenticate

This procedure is not only confirm that both card/tag and reader device can trust each other, but also generates a session key which can be used to keep the further communication path secure.

Note Master Keys are identified by their key number 0x00, this is valid on PICC level (selected AID=0x00) and on Application Level.

Operation procedure: Active-IDLE/Active-ALL -->> RATS -- >> Authenticate

		1-5/4 Will AILE Classic Oldalight/C DECHING 150144	438 15015693 150
ard/Sys Command – Tag Type	4403 SAK	20	Active-IDLE
UID number 046C86FA3C4B80			Active-ALL
ATS	067577810280		RATS
Version	0401010100180	504010101041805046C86FA3C4B80BA7418B3A00816	Get Version
EY Commands			
Key Version	00		Get Key Version
Key Number	00	KEY 000000000000000000000000000000000000	Authenticate
Key Setting			Get Key Setting
ew Key Setting		1	Change Key Setting
Key Number		Key Setting 00	
Original Key	000000000000000000000000000000000000000	Change Key	
New Key	0011223344556		
ard Level			
			PICC Level
NOTE: Please click	< right side button f	'or further detail operation!	Application Level
otocol Screen			
50 00 1C 8B 04 01 0 50 00 01 85 00 D4 50 00 01 85 00 D4	1 01 00 18 05 0	4 01 01 01 04 18 05 04 6C 86 FA 3C 4B 80 BA 74 18 B3 A0 08	16 FBsuccess
50 00 11 81 00 00 00 50 00 00 81 D1su) 00 00 00 00 00 ccess	00 00 00 00 00 00 00 00 00 C0	

2.8.6 DESFire Card- Get Key Setting

This function command allows to get configuration information on the card/tag and application master key configuration setting.

It returns the maximum number of keys which can be stored within the selected application.

Before Get Key Setting, a proceeding authentication with the master key is required.

Operation procedure: Active-IDLE/Active-ALL -->> RATS -- >> Authenticate -->> Get Key Setting

vstem Auto-List Ca	rds ISO14443	A-3/4 MIFARE Classic Ultralight/C DESFire ISO14	443B ISO15693 ISO76
Card/Sus Command			
Tag Type	4403 SAM	20	Active-IDLE
UID number	046C86FA3C4B	80	Active-ALL
ATS	067577810280		RATS
Version	0401010100180	504010101041805046C86FA3C4B80BA7418B3A00816	Get Version
KEY Commands			
Key Version	00		Get Key Version
Key Number	00	KEY 000000000000000000000000000000000000	Authenticate
Key Setting	0F		Get Key Setting
New Key Setting			Change Key Setting
Key Number		Key Setting 00	
Original Key	000000000000000000000000000000000000000	000000000000000000	Change Key
New Key	0011223344556	6778899AABBCCDDEEFF	
Card Level			PICC Level
NOTE: Please cl	ick right side button	for further detail operation!	
			Application Level
Protocol Screen			
> 50 00 01 85 00 D4 > 50 00 11 81 00 00	success 00 00 00 00 00 00 00	0 00 00 00 00 00 00 00 00 C0	
50 00 00 81 D1 > 50 00 00 82 D2	SUCCESS		
< 50 00 02 82 0F 01	DEsuccess		

2.8.7 DESFire Card- Change Key Setting

This command changes the master key configuration setting depending on the currently selected AID.

This command takes one byte as parameter which codes the new master key settings., details configuration changeable bits, please refer to detail datasheet of using card.

Authenticate is needed before Change Key Setting.

Operation procedure: Active-IDLE/Active-ALL -->> RATS -- >> Authenticate -->> Change Key Setting

stem Auto-List Ca	rds ISO1444	34.3/4 MIEARE Classic Liltralight/C DESEire ISO14	1/3B IS015693 IS07
	1001111		
Tag Type	4403 SA	K 20	Active-IDLE
UID number	046C86FA3C4	B80	Active-ALL
ATS	067577810280		RATS
Version	040101010018	0504010101041805046C86FA3C4B80BA7418B3A00816	Get Version
KEY Commands			
Key Version	00		Get Key Version
Key Number	00	KEY 000000000000000000000000000000000000	Authenticate
Key Setting	0F		Get Key Setting
New Key Setting			Change Key Setting
Key Number		Key Setting 00	
Original Key	0000000000000	Change Key	
New Key	001122334455		
Card Level			PICC Level
NOTE: Please cl	ick right side buttor	n for further detail operation!	Application Level
Destanal Caroos			
< 50 00 01 85 00 D4	success		
>> 50 00 11 81 00 00 << 50 00 00 81 D1	00 00 00 00 00 00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00 00 C0	
>> 50 00 00 82 D2			
< 50 00 02 02 0F 01	DE Success		Clear

2.8.8 DESFire Card- Change Key

This command allows to change any key stored on the card/tag.

Parameter value to be changed:

Key Number:	One byte length and has to be range from 0x00 to number of application key to 1
Key Setting:	Whether a change of key is permit or not and show which key is need for Authenticate
	before the Change key command
Original Key:	Old key
New Key:	the key to be changed

To the Change Key Key or Master Key, <u>Authenticate Master Key is necessary</u>. Other details for specific operations, please refer to datasheet of using card.

Operation procedure: Active-IDLE/Active-ALL -->> RATS -- >> Authenticate -->> Change Key

		DEOFin Heart	
ystem Auto-List Ca	ds ISO14443A-3/4 MIFARE Classic	Ultralight/C DESFire ISO144	443B ISO15693 ISO78
Card/Sys Command			
Tag Type	4403 SAK 20		Active-IDLE
UID number	046C86FA3C4B80		Active-ALL
ATS	067577810280		RATS
Version	0401010100180504010101041805046C86F	FA3C4B80BA7418B3A00816	Get Version
KEY Commands			
Key Version	00		Get Key Version
Key Number	00 KEY 0000000000	000000000000000000000000000000000000000	Authenticate
Key Setting	0F		Get Key Setting
New Key Setting			Change Key Setting
Key Number	00 Key Setting 00		
Original Key	000000000000000000000000000000000000000		Change Key
New Key	00112233445566778899AABBCCDDEEFF	F	
Card Level			
			PICC Level
NOTE: Please ci	k right side button for further detail operation!		Application Level
Protocol Screen			
<pre><< 50 00 01 85 00 D4 >> 50 00 11 81 00 00 << 50 00 00 81 D1</pre>	success 0 00 00 00 00 00 00 00 00 00 00 00 00 0	00 C0	
>> 50 00 00 82 D2			
< 50 00 02 62 0F 01	/⊑Success		Clear

2.8.9 DESFire Card- PICC Level

This interface is for PICC application operations.

When enter into PICC Level interface, Authenticate Master Key is necessary

Operation procedure: Active-IDLE/Active-ALL -->> RATS -- >> Authenticate -->> PICC Level

🔊 Demo		restar and restar	
File About Exit			
System Auto-List Ca	ards ISO14443/	A-3/4 MIFARE Classic Ultralight/C DESFire ISO14	443B ISO15693 ISO7816
Card/Sys Command			
Tag Type	4403 SAK	20	Active-IDLE
UID number	046C86FA3C4B	80	Active-ALL
ATS	067577810280		RATS
Version	0401010100180	504010101041805046C86FA3C4B80BA7418B3A00816	Get Version
KEY Commands			
Key Version	00		Get Key Version
Key Number	00	KEY 000000000000000000000000000000000000	Authenticate
Key Setting	0F		Get Key Setting
New Key Setting			Change Key Setting
Key Number	00	Key Setting 00	
Original Key	0000000000000	00000000000000000	Change Key
New Key	0011223344556	6778899AABBCCDDEEFF	
Card Level			
			2 PICC Level
NOTE: Please cl	lick right side button i	for further detail operation!	Application Level
Protocol Screen			
<pre><< 50 00 00 81 D1 >> 50 00 00 82 D2 << 50 00 02 82 0F 01 >> 50 00 11 81 00 00</pre>	success DEsuccess 00 00 00 00 00 00	00 00 00 00 00 00 00 00 00 00	
<< 50 00 00 81 D1	success		Clear +
2.8.9.1 PICC Level-Create Application

This command allows to create new application on the PICC

Parameters to be operated:

Application ID(AID): 24 bit number=0x00 00 00 and reserved as reference to the PICC itself Key Setting: Application Master Key Setting as defined in Chapter <u>2.8.6</u>

Key Number: Number of Keys defines how many keys can be stored within the application for cryptographic purposes

For example below:

🔊 Demo				and the second		E 83
File Ab	out Exit					
System	Auto-List Cards	ISO14443A-3/4	MIFARE Classic Ultra	light/C DESFire	ISO14443B ISO15693	ISO7816
Card/	PICC Level					
	Application ID	No App!	*			
			· •		Get APP	E I
VEVC		_				
L NCT U	Application ID		-		Select APP	
ĸ	NOTE: The two	o functions above s	lo not need a Key Authorit	instiant		
ĸ	NOTE. The tw		io not need a Key Addient	ication		
ĸ	-					
New K	Application ID	01 00 00	Key Setting 09	Key Number 01	Create APP	ng
к					Delete APP	
0	Application ID		-		20000707	
			_		Format PICC	
	>> 50 00 05 86 0					
Card	<< 50 00 00 86 C	6 success				
Protoc						
<< 50						•
>> 50 << 50					Clear	
>> 50		-				
					Clear	T T
						Control of

Note: Proceeding PICC Master key authentication may be required

2.8.9.2 PICC Level-Get Application

To Get the Application ID or IDs stored in the card.

Demo	and the second division of the	-	-	10,000	a state of	
File About Exit						
System Auto-List Cards	ISO14443A-3/4	MIFARE Classic	Ultralight/C	DESFire IS	014443B ISO156	93 ISO7816
Card/						
Application ID	All ApplDs: 01 00 00 00 00 01	*			Get APP	
KEY C Application ID	01 00 00	•			Select APP	
K NOTE: The tw	o functions above c	lo not need a Key Au	thentication!			Ē
New K Application ID	01 00 00	Key Setting 09	9 Key M	Number 01	Create APP] ng
O Application ID	01 00 00	•			Format PICC	
Protocol Screen	0					
Card << 50 00 07 88 0	2 01 00 00 00 00 0	1 DDsuccess				
Protoc << 50 >> 50						-
<< 50 >> 50 << 50	_				Clear	Ŧ
					Clea	ar 🗸

2.8.9.3 PICC Level-Select Application

To select the Application ID going for next further Application Level operations

Demo Filo At	out Evit	and second		100 m	and there is	
System	Auto-List Cards	1501///30-3//	MIFARE Classic	Ultralight/C DESE		15693 150781
System	PICC Level	100 1444 0 - 0/4	WIII AILE Classic	ontangino _ beor		×
Card/						
	Application ID	All ApplDs: 01 00 00 00 00 01	*		Get APP	
- KEY C	Application ID	01 00 00 01 00 00 00 00 01		hantication	Select APF	
ĸ	NOTE. The two	Tunctions above t	to not need a key Au	nenncation		- 6
New K	Application ID	01 00 00	Key Setting 09	Key Number	01 Create API	o ng
0	Application ID	01 00 00	*		Delete APF	
	Protocol Screen				Format PIC	
- Card	>> 50 00 00 88 D << 50 00 07 88 02	8 2 01 00 00 00 00 00 0	1 DDsuccess			
Protoc						-
>> 50 << 50 >> 50 << 50					Clear	-
						Clear

2.8.9.4 PICC Level-Delete Application

This command is to delete the application ID or IDs, the all application IDs will be listing on left side box.

ile At	oout Exit					
ystem_	Auto-List Cards	ISO14443A-3/4	MIFARE Classic Ult	ralight/C DESFire	ISO14443B ISO15693	ISO781
Card	N PICC Level					
caru	-					
	Application ID	All ApplDs: 01 00 00 00 00 01	*		Get APP	
KEY C	Application ID	01 00 00	•		Select APP	
к к	NOTE: The two	o functions above o	lo not need a Key Authe	ntication!		2
New K	Application ID	01 00 00	Key Setting 09	Key Number 01	1 Create APP	ng
0	Application ID	01 00 00	•		Delete APP Format PICC	
	Protocol Screen	000001				
Card	>> 50 00 00 88 D << 50 00 07 88 0	18 2 01 00 00 00 00 00 0	1 DDsuccess		*	
<pre>> roto < 50 > 50 < 50 > 50 > 50 < 50</pre>					Clear	
					Clear	

2.8.9.5 PICC Level-Format PICC

This command releases the PICC user memory and no parameter are passed with this command

Demo	haut Evit	and the second se		P	CO-Au Tra		<u> </u>
System	Auto-List Cards	ISO14443A-3/4	MIFARE Classic Ultra	ight/C DESFir	e ISO14443B	ISO15693	ISO7816
Card/	NICC Level						
	Application ID	All ApplDs: 01 00 00	*		Ge	et APP	
KEY C	Application ID NOTE: The tw	01 00 00 o functions above do	▼ o not need a Key Authent	cation!	Sele	ect APP	
K New K	Application ID	01 00 00	Key Setting 09	Key Number	01 Cre	ate APP	ng
0	Protocol Screen	010000		[Form	nat PICC	
- Card	>> 50 00 05 86 0 << 50 00 00 86 D >> 50 00 00 88 D << 50 00 04 88 0 >> 50 00 00 8A D << 50 00 00 8A D	1 00 00 09 01 DA 06success 08 1 01 00 00 DCsu 0A 0Asuccess	ccess			*	
Protoc << 50 >> 50 << 50 >> 50					CI	ear +	
<< 50						Clear	

2.8.10 DESFire Card- Application Level

When enter into Application Level, it must do Select APP --> Authenticate Master Key firstly .

no ribout Exit	1		
System Auto-List Ca	ards ISO1444	3A-3/4 MIFARE Classic Ultralight/C DESFire ISC	014443B ISO15693 ISO781
Card/Sys Command			
Tag Type	4403 SA	K 20	Active-IDLE
UID number	042F171AEB2	F80	Active-ALL
ATS	067577810280		RATS
Version	04010101001A	0504010101041A05042F171AEB2F80BA351765604712	Get Version
KEY Commands			
Key Version			Get Key Version
Key Number	00	KEY 000000000000000000000000000000000000	Authenticate
Key Setting			Get Key Setting
New Key Setting			Change Key Setting
Key Number		Key Setting 00	
Original Key	000000000000	000000000000000000000000000000000000000	Change Key
New Key	001122334455	66778899AABBCCDDEEFF	
Card Level			
			PICC Level
NOTE: Please cl	lick right side butto	for further detail operation!	Application Level
Protocol Screen			
<< 50 00 00 81 D1 >> 50 00 11 81 00 00	success 00 00 00 00 00 00	0 00 00 00 00 00 00 00 00 00 C0	
>> 50 00 11 81 00 00	00 00 00 00 00 00 00	0 00 00 00 00 00 00 00 00 00 C0	
<< 50 00 00 81 D1	success		Clear

2.8.10.1 Application Level-Get File IDs

This command returns the File IDs of all active files within the currently selected application

Application	Level			1				
File IDs	No Files			*				
				-				Get FileID
File ID	•							Delete File
- File Settin	g							
File ID	•							
File Type		Communicate way		Access right		File size		Get File Setting
File ID	-	Communicate way	00	Access right	EE EE			Change File Setting
Standard D	ataFile &	Backup File						
File ID	00	Communicate way	00	Access right	EE EE	File size	00 00 00	Create StdFile
NOTE: St	dFile mear	ns to Standard Data F	ile					Create BackupFile
File ID	•	Address 00	00	Length	04 00			
Data							*	Read Data
Data							BackupFile	Write Data
Value File &	Record F	ile —						
								Value File
NOTE: PI	ease click	right side button for fu	irther <mark>deta</mark> i	l operation!				Record File
Protocol Sc	reen							
> 50 00 00 < 50 00 01	8C DC 8C 00 DD	success						
								Clear

2.8.10.2 Application Level-Get File Setting

To Get information on the properties of a specific file, and the File ID need to be selected when proceeding

Application	Level		other designation of the local division of t	State of Contract			-	the local	
File IDs	05				*				
					+				Get FileID
File ID	05	•							Delete File
- File Settin	ig —	_							
File ID	05	•							
File Type	00		Communicate way	00	Access right	EEEE	File size	10 00 00	Get File Setting
File ID	05	•	Communicate way	00	Access right	EE EE			Change File Setting
Standard D	ataFi	le &	Backup File	_					
File ID	05		Communicate way	00	Access right	EE EE	File size	10 00 00	Create StdFile
NOTE: St	dFile	mea	ans to Standard Data Fi	le					Create BackupFile
File ID	05	٠	Address 00	00	Length	04 00			
Data								*	Read Data
Data								BackupFile	Write Data
Value File &	Rec	ord	File —						
									Value File
NOTE: P	ease	clic	k right side button for fu	rther deta	il operation!				Record File
Droto - I.C.									
< 50 00 01	8C 0)SUCCESS						
> 50 00 06	8F 0	5 00	EE EE 10 00 CC						
> 50 00 00	8F D 8C D	F!	success						
< 50 00 02	8C 0	1 05	DAsuccess		_				
< 50 00 01	8D 0	7 00	00 EE EE 10 00 CD	success					-
					_				Clear

2.8.10.3 Application Level-Change File Settings

This is to change the access parameters of an existing file.

Parameters to be changed:

File ID: file number within currently selected application, One byte Communication way: new communication settings, One byte Access right: new access rights, Two byte

More details information, please refer to datasheet of using card accordingly

Application	Level		-				-	de boat	
File IDs	05				*				
					+				Get FileID
File ID	05	•							Delete File
File Settin	ig —	-							
File ID	05	•							
File Type	00		Communicate way	00	Access right	EEEE	File size	10 00 00	Get File Setting
File ID	05	•	Communicate way	00	Access right	EE EE			Change File Setting
Standard D	ataFi	le &	Backup File						
File ID	05		Communicate way	00	Access right	EE EE	File size	10 00 00	Create StdFile
NOTE: S	tdFile	mea	ns to Standard Data F	ile					Create BackupFile
File ID	05	•	Address 00	00	Length	04 00			
Data								*	Read Data
Data								BackupFile	Write Data
alue File &	Rec	ord	File						
									Value File
NOTE: P	lease	click	right side button for fu	inther deta	ail operation!				Record File
Protocol Sc	roon								
> 50 00 04	8E 0	5 00	EE EE DF						
< 50 00 00	oe D	E	SUCCESS						
									Clear

2.8.10.4 Application Level-Create Std Data File/ Create Backup Data file

This is used to create files for the storage of plain unformatted user data within an existing application on the PICC, and Create Backup Data File supporting the feature of an integrated backup mechanism.

Parameters to be created:

File ID:File number of the new file and range from 0x00 to 0x0F, ONE byteCommunicate way:Communication setting, ONE byteAccess right:Access right for the new file, TWO byteFile size:the file of the file in byte, THREE byte

More details information, please refer to datasheet of using card accordingly

Application	evel	
File IDs	No Files	
	-	Get FileID
File ID		Delect File
File Settin	9	
File ID	•	
File Type	Communicate way Access right File size	Get File Setting
File ID	Communicate way 00 Access right EE EE	Change File Setting
- Standard Da	ntaFile & Backup File	
File ID	05 Communicate way 00 Access right EE EE File size 10 00 00	Create StdFile
NOTE: St	dFile means to Standard Data File LSB first	Create BackupFile
File ID	✓ Address 00 00 Length 04 00	
Data	• • • • • • • • • • • • • • • • • • •	Read Data
Data	BackupFile	Write Data
- Value File 8	Record File	
10000		Value File
NOTE: PI	ease click right side button for further detail operation!	Record File
Protocol Sc	reen	
>> 50 00 00 << 50 00 01	BC DC BC 00 DDsuccess	*
>> 50 00 06 << 50 00 00	8F 05 00 EE EE 10 00 CC 8F DFsuccess	
		Clear

2.8.10.5 Application Level-Delete File

This command is to permanently deactivate a file within the file directory of currently selected application

This operation invalidates the file directory entry of the specified file which means that the file can't be accessed anymore.

Application	Level	other Designation of the local division of t		-		1000	and insert	
File IDs	No Files			*				
				÷				Get FileID
File ID	•							Delete File
- File Settin	ig —							
File ID	•							
File Type		Communicate way		Access right		File size		Get File Setting
File ID	-	Communicate way	00	Access right	EE EE			Change File Setting
Standard D	ataFile &	Backup File						
File ID	00	Communicate way	00	Access right	EE EE	File size	00 00 00	Create StdFile
NOTE: St	tdFile mear	ns to Standard Data F	ile					Create BackupFile
File ID	•	Address 00	00	Length	04 00			
Data							*	Read Data
Data							🔲 BackupFile	Write Data
Value File &	Record F	ile						
								Value File
NOTE: PI	ease click	right side button for fu	irther deta	il operation!				Record File
Protocol Sc	reen							
								Clear

2.8.10.6 Application Level-Read Data

To read data from Standard Data Files or Backup Data Files

Parameters to be operated:

File ID: the file number to be read from, ONE byte

Address: the starting position for the read operation , THREE byte, range from 0x00 00 00 to 0x FF FF FF Length: the number of data bytes to be read, THREE byte, and range 0x00 00 00 to 0x FF FF FF

Application	Level							
File IDs	05			*				
File ID	05 🗸			-				Get FileID Delect File
— File Settir	a							
File ID	05 🗸							
File Type	00	Communicate way	00	Access right	EEEE	File size	10 00 00	Get File Setting
File ID	05 👻	Communicate way	00	Access right	EE EE			Change File Setting
Standard D	ataFile 8	Backup File						
File ID	00	Communicate way	00	Access right	EE EE	File size	00 00 00	Create StdFile
NOTE: S	tdFile me	ans to Standard Data F	ile					Create BackupFile
File ID	05 👻	Address 00	00	Length	04 00			
Data	000000	00					* *	Read Data
Data							BackupFile	Write Data
Value File 8	Record	File						
Turuo I no I	, no o o na							Value File
NOTE: P	ease clic	k right side button for fu	irther det	ail operation!				Record File
Protocol Se	reen							
>> 50 00 00	8C DC							
<< 50 00 02 >> 50 00 01	8C 01 05 8D 05 D9	DAsuccess						
<< 50 00 07	8D 07 00	00 EE EE 10 00 CD	-success					
<< 50 00 03	95 00 00	00 00 C1 success						
								Clear

2.8.10.7 Application Level-Write Data

To write data to Standard Data Files and Backup Data Files

Parameters to be operated:

File ID: the file number to be written into, ONE byte

Address: the starting position for the writing operation , THREE byte, range from 0x00 00 to 0x FF FF FF

Length: the number of data bytes to be read, THREE byte, and range 0x00 00 00 to 0x FF FF FF Data:

More details information, please refer to datasheet of using card accordingly

	Level							
File IDs	05			*				
File ID	05 👻			*				Get FileID Delect File
File Settin	ıg —							Access to prove the second
File ID	05 👻							
File Type	00	Communicate way	00	Access right	EEEE	File size	10 00 00	Get File Setting
File ID	05 👻	Communicate way	00	Access right	EE EE			Change File Setting
Standard D	ataFile 8	Backup File						
File ID	00	Communicate way	00	Access right	EE EE	File size	00 00 00	Create StdFile
NOTE: S	tdFile me	ans to Standard Data F	ile					Create BackupFile
File ID	05 👻	Address 00	00	Length	04 00			
Data	000000	00					*	Read Data
	a 01020304 🔲 BackupFile							Write Data
Data	010203	04						
Data /alue File 8	010203	File —						Volue File
Data	010203	File						Value File
Data /alue File & NOTE: P	010203	File k right side button for fu	irther detai	l operation!				Value File Record File
Data Value File & NOTE: P	010203 & Record lease click	Filek right side button for fu	ırther detai	l operation!				Value File Record File
Data /alue File & NOTE: P Protocol Sc < 50 00 02	010203 Record lease clici reen 8C 01 05	Filek right side button for fu	uther detai	l operation!				Value File Record File
Data /alue File & NOTE: P Protocol Sc < 50 00 02 > 50 00 07	010203 Record lease click reen 8C 01 05 8D 05 D9 2D 05 D9	File k right side button for fu DAsuccess	uther detai	l operation!				Value File Record File
Data /alue File { NOTE: P Protocol Sc < 50 00 02 > 50 00 07 < 50 00 07 > 50 00 05	010203 Record lease clic reen 8C 01 05 8D 05 05 8D 07 00 95 05 00	File k right side button for fu DAsuccess 00 EE EE 10 00 CD 00 04 00 C1	uther detai	l operation!				Value File Record File
Data /alue File { NOTE: P Protocol Sc < 50 00 02 > 50 00 01 < 50 00 07 > 50 00 05 < 50 00 04	010203 Record lease clic reen 8C 01 05 8D 05 D9 8D 07 00 95 05 00 95 00 00	File k right side button for fu DAsuccess 00 EE EE 10 00 CD 00 04 00 C1 00 00 C1success	uther detai	l operation!				Value File Record File
Data /alue File { NOTE: P Protocol Sc < 50 00 02 > 50 00 01 < 50 00 05 < 50 00 04 > 50 00 04 > 50 00 09 < 50 00 04 > 50 00 04	010203 Record lease clic reen 8C 01 05 8D 05 D9 8D 07 00 95 05 00 95 00 00 96 05 00	File k right side button for fu DAsuccess 00 EE EE 10 00 CD 00 04 00 C1 00 00 C1success 00 04 00 01 02 03 04 C	uther detai -success >A	l operation!				Value File Record File

2.8.11 Application Level-Value File

2.8.11.1 Value File -Create Value File

To create files or the storage and manipulation of 32bit signed integer value within an existing application on the PICC

More details information, please refer to datasheet of using card accordingly

ApplicationLeve			and the second	Autom to	
Nalue File					
Value File —					
File ID 00	Communicat	e way 00	Access right 00 00	Limit Credit 00 🗸	
	Lower Limit	00 00 00 00	Upper Limit 00 00 00 00	Value 00 00 00 00	Create Value File
File ID 00	Value				Get Value
File ID 00	Value	01 00 00 00]	Credit	Debit
			Commit Transaction	Absort Transaction	Limit Credit
Protocol Scre	en				
>> 50 00 11 91 << 50 00 00 91	00 00 00 00 00 00 00 C1success	00 00 00 00 00 00	00 00 00 00 00 00 00		*
					Clear
_					

2.8.11.2 Value File -Get Value

It allows to read the currently stored value from Value File

Value File		
Value File		
File ID 00 Communicate way 00 Lower Limit 00 00 00 00	Access right 00 00 Limit Credit 0	0 Create Value File
File ID 00 Value 00 00 00 00		Get Value
File ID 00 Value 01 00 00 00	C	redit Debit
	Commit Transaction Absort Tran	Isaction Limit Credit
Protocol Screen		
>> 50 00 11 91 00 00 00 00 00 00 00 00 00 00 00 00 00	0 00 00 00 00 00 D0	*
<< 50 00 04 97 00 00 00 00 C3success		
		Clear

2.8.11.3 Value File-Transactions operation

The transactions are including:

Credit: increase a value stored in a Value File

Debit: decrease a value stored in a Value File

- **Commit Transaction**: Validate all previous write access on Backup Data File, Value Files and Record Files within one application
- Abort Transaction: invalidate all previous write access on Backup Data File, Value Files and Record Files within one application
- Limit Credit: limited increase of a value in a Value File without having full Read&Write permission to the file

More details information, please refer to datasheet of using card accordingly

No Value File	
Value File	
File ID 00 Communicate way 00 Access right 00 00 Limit Credit 00 Imit Credit Imit Credit	Create Value File
File ID 00 Value 00 00 00 00	Get Value
File ID 00 Value 01 00 00 00 Credit Commit Transaction Absort Transaction	Debit Limit Credit
Protocol Screen	
	*
	Clear

2.8.12 Application Level- Record File

2.8.12.1 Record File-Create Linear/Cyclic Record File

This is used to create files for multiple storage of structural data, for example for logging transactions,

More details information, please refer to datasheet of using card accordingly

Record File	
_ Create/Clear Record File	
File ID 00 Communicate way 00 Access right 00 00	Create Linear Record File
File size 00 00 00 Record Number 00 00	Create Cyclic Record File
	Clear Record File
Read Record	
File ID 00 Record No. 00 00 Record Number 00 00	-
*	
The second se	Read Record
Write Record	
File ID 00 Address 00 00	
-	Write Record
Protocol Screen	
	*
	Clear

2.8.12.2 Record File-Read Record

To read out a set of complete records from a Cyclic or Liner Record File

Parameters to be read:

File ID: the file number to be read from, ONE byte length

Record No: the offset of the newest record which is read out, THREE bytes long

Record Number: the number of records to be read from PICC

Record File	
Create/Clear Record File	
File ID 00 Communicate way 00 Access right 00 00	Create Linear Record File
File size 00 00 00 Record Number 00 00	Create Cyclic Record File
	Clear Record File
Read Record	
File ID 00 Record No. 00 00 Record Number 00 00	
*	
	Read Record
r Write Record	
File ID 00 Address 00 00	
*	Write Record
Protocol Screen	
	*
	Clear

2.8.12.3 Record File-Write Record

To write data to a Cyclic or Liner Record File

Parameters to be written:

File ID: the file number to be written into and has to be range from 0x00 to 0x07, ONE byte length Address: the offset within one single record, and range from 0x00 00 00 to record size - 1

reate/Clear F	Record File					
ile ID 00	Communicate	way 00	Access right	00 00		Create Linear Record File
	File size	00 00 00	Record Number	00 00		Create Cyclic Record File
						Clear Record File
lead Record	-					
ile ID 00		Record No.	00 00	Record Number	00 00	
	51				*	
						Dead Deard
	-				Ŧ	Read Record
/rite Record						
ile ID 00	Address	00 00				
	63				*	
					*	Write Record
otocol Scree	1					

2.9 ISO14443B

2.9.1 ISO14443B- Active-TypeB

To active ISO14443 Type B cards/tag

Demo	Statistics and statistics		and the second second	340	the local		
File About Exit	arda 180144424 2/4		Liltraliaht/C	DESEiro	ISO14443B	19015602	1007916
System Auto-List Ca	ards 15014445A-5/4	WIFARE Classic	Oltraight/C	DESFILE	10014450	13015635	1307010
Card Info							
	10					Active-TypeB	
						, iourio 13polo	
LISO14443B-4							
	0084000008			2		APDU	
	008400008					APDU Channel	
	0,0000400000						
Protocol Screen							
							^
					ſ	Cloar	
						Clear	

2.9.2 ISO14443B-4 APDU

Demo ile About Exit		
System Auto-List Car	ds ISO14443A-3/4 MIFARE Classic	Ultralight/C DESFire ISO14443B ISO15693 ISO781
Card Info	24 DE	
Tag Type		
UID number		Active-TypeB
ISO14443B-4		
	0084000008	APDU
-	0A000084000008	APDU Channel
Protocol Screen		
		Clear

2.9.3 ISO14443B-4 APDU Channel

This is transfer channel to send any available commands to the card directly through RF chipset.

Details commands please refer to ISO14443B-4 Standard .

ile About	Evit			-	340	the local		 >
system A	uto-List Cards	ISO14443A-3/4	MIFARE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693 IS	50781
_ Card Info		73				·		
4.94	Tag Type					_		
UIE	0 number						Active-TypeB	
ISO14443B	.4 ———							
	008	4000008					APDU	
	0A0	00084000008					APDU Channel	

2.10 ISO15693

2.10.1 ISO15693-Inventory

To get the UID of ISO15693 standard cards/tags.

Use 16 times Slot

When ______ is selected, it can be read multiple cards in one time, and the all UID

numbers will be listing on leftside box.

D701524900010450	I Line 16 times Slat	Inventory
UID number B791F3A8000104E0	✓ Use to times Slot	Select Card
NOTE: Checkmark "Use 16 times Slot" when reading mul	tiple cards!	Ctev Quiet
APDU 0A000084000008		APDU Channel
Flag 0x22 - Block Addr 2 -		Read Block
NOTE: Default Flag =0x22, you need UID for all operation	11223344	Write Block
For single card operation,there is no need to do Ir	iventory firstly!	Lock Block
	A CONTRACTOR OF THE OWNER	Write AFI
AFI Attention: Be	careful when do LockAFI, this is one time operation!!	Lock AFI
DSEID		Write DSFID
Attention: Be	careful when do LockDSFID,this is one time operation!!	Lock DSFID
		GET Card Info
etecel Sercen • 50 00 03 A1 06 00 00 F4 • 50 00 08 A1 B7 91 F3 A8 00 01 04 E0 61succ	cess	Clear

2.10.2 ISO15693-Select card

To select the card for further read/write operations, when there are multiple cards, please select the right one on UID number lists after inventory.

ver B791f	-3A8000104E0							
ber B791I	F3A8000104E0							
			8	✓ Use	16 times Slot		Inventory	
eckmark "lice 1	£ times Slot" when re	edina multinle	oerdel				Select Card	
Schlidin Use it	Junits out mistrice	saing manapro	Colua:				Stay Quiet	
J 0A000	0084000008					A	PDU Channel	
)x22 -	Block Addr 2	•					Read Block	
efault Flag =0x2:	2 . vou need UID for a	Il operations;	11223344				Write Block	
r single card ope	eration,there is no ne	ed to do Invent	tory firstly!				Lock Block	
							Write AFI	
	Atte	ntion: Be care	ful when do Lo	ockAFI, this is o	ne time operatio	m!!	Lock AFI	
		Attention: Be careful when do LockDSFID, this is one time operation!!				Write DSFID		
	Alle					Lock DSFID		
							GET Card Info	
	I 0A00I x22 → fault Flag =0x22 single card ope	DA000084000008 x22 Block Addr 2 fault Flag =0x22, you need UID for all single card operation, there is no need Attended Attended	Image: Description of the second system Image: Descriptio	I 0A000084000008 x22 Block Addr 2 fault Flag =0x22, you need UID for all operations; 11223344 single card operation, there is no need to do Inventory firstly! Attention: Be careful when do Lu Attention: Be careful when do Lu Attention: Be careful when do Lu	Image: state of the state	Image: Description of the second s	I 0A000084000008 A x22 Block Addr Image: Constraint of the state of the sta	Image: Stay Quiet Image: Stay Quiet APDU Channel x22 Block Addr Fault Flag =0x22, you need UID for all operations; 11223344 fault Flag =0x22, you need UID for all operations; 11223344 Single card operation, there is no need to do Inventory firstly! Lock Block Attention: Be careful when do LockAFI, this is one time operation!! Write AFI Attention: Be careful when do LockDSFID, this is one time operation!! Write DSFID Attention: Be careful when do LockDSFID, this is one time operation!! GET Card Info

2.10.3 ISO15693-Stay Quiet

To make the	card	to	be	slept
-------------	------	----	----	-------

ystem Auto-List	Cards ISO14	443A-3/4	MIFARE Clas	sic UI	tralight/C	DESFire	ISO14443B	ISO15693	IS078
ISO15693									
UID number	B791F3A80001	04E0		¥	🔽 Use	16 times Slo	t	Inventory	
NOTE Charles	Mine 40 Kimpe Cla							Select Card	
NOTE: Checkman	Cose 16 times Siol	when reading	multiple caras					Stay Quiet	
APDU	0A0000840000	08						APDU Channe	1
Flag 0x22	- Block A	ddr 2	•					Read Block	
NOTE: Default Fla	ag =0x22 , you need	UID for all ope	rations; 1122	23344				Write Block	
For single	card operation,then	e is no need to	do Inventory firs	stly!				Lock Block	
		_					6	Write AFI	
AFI		Attention	Be careful who	en do Loci	AFI, this is c	one time operat	ion!!	Lock AFI	
DSFID					000010 4614			Write DSFID	
		Allenbon	. De careiui wii	an do Lock	DoriD,uiis I	s one une ope		Lock DSFID	
								GET Card Info	
Protocol Screen									
>> 50 00 03 A1 06	00 00 F4	04 50 64	meredu.						4
>> 50 00 09 A6 22	B7 91 F3 A8 00 01	01 04 E0 61s	success						
> 50 00 02 A6 00 > 50 00 09 A2 22	B7 91 F3 A8 00	5 01 04 E0 41							
<< 50 00 02 A2 00	00 F0succes	S							
								01	

2.10.4 ISO15693-APDU

This is transfer channel to send any available commands to the card directly through RF chipset.

And The first CMD before transfer must be ISO15693_Inventory, this will set the reader (or module) go into ISO15693 mode, Details commands please refer to ISO15693 Standard .

ystem Auto-List Cards ISO1	4443A-3/4 MIFARE	Classic Ult	alight/C	DESFire	ISO14443E	ISO15693	ISO78
ISO15693							
UID number B791F3A800	0104E0	•	🔽 Use 1	6 times Slo	t [Inventory]
NOTE: Checkmark "Use 16 times S	lot" when reading multiple	cards!			[Select Card	
		And the			[Stay Quiet	
APDU 0A000084000	0008				[APDU Channel	
Flag 0x22 - Block	Addr 2 🗸					Read Block]
NOTE: Default Flag =0x22 , you ne	ed UID for all operations;	11223344				Write Block	
For single card operation,the	ere is no need to do Inventi	ory firstly!			[Lock Block]
					[Write AFI]
AFI	Attention: Be care	ful when do Lock.	FI, this is or	e time operat	ion!!	Lock AFI]
DSFID	Attention: Po pers	ful when de Leoki	CEID this is		(Write DSFID]
	Allenbon, be care	ui when do Locki	oriu,mis is	one time oper		Lock DSFID]
					[GET Card Info]
Protocol Screen							
>> 50 00 03 A1 06 00 00 F4 << 50 00 08 A1 B7 91 F3 A8 00 0 >> 50 00 09 A6 22 B7 91 F3 A8 0 << 50 00 02 A6 00 00 F4succe	1 04 E0 61success 0 01 04 E0 45 ss						

2.10.5 ISO15693-Read Block

To read the data in specific block address

Parameters to be optional:

Flag: 0x22 or 0x02, refer to datasheet of using card

Block Addr: the block address to be read

ISO15693	uto-List C	ards	ISO14443A	-3/4	MIFAR	E Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	ISO781
the second se											
UID nun	nber	B791F3/	48000104E	0			✓ Use	16 times Slo	t	Inventory	
NOTE C	heckmark '	Tice 16 tu	nee Slot" whe	n readin	a multiple	cardel				Select Card	
NOTE O	nockindra	030 10 11	nes citer mile	in reading	y manapro	Corda:				Stay Quiet	
API	DU	0A00008	34000008							APDU Channel	
Flag	0x22 -	· E	Block Addr	2	•	0000000)			Read Block	
NOTE: I	Default Flag	; =0x22 , y	ou need UID :	for all op	erations;	11223344	ŧ.			Write Block	
F	or single ca	ard operat	ion,there is n	o need to	do Inven	tory firstly!				Lock Block	
					10.00					Write AFI	
AFI				Attentio	n: Be care	eful when do	LockAFI, this is (one time operat	ion!!	Lock AFI	
DSFID	_		_	Attentio	n: Re care	ful when do	lockDSEID this i	s one time one	ration	Write DSFID	
				/						Lock DSFID	
										GET Card Info	

2.10.6 ISO15693-Write Block

To write data into specific block address

Parameters to be optional:

Flag:0x22 or 0x02, refer to datasheet of using cardBlock Addr:the block address to be written, 4byte length

ystem	Auto-List	Cards	ISO14443A	-3/4 1	MIFARE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	ISO7816
ISO156	93									
UID	number	B791F	3A8000104E0)		▼ Us	se 16 times Slo	ot	Inventory	
NOT	- Chaokman	Wilso 16	times Slott when	o reading	multiple cordol				Select Card	
NOT	L Checkman	K USE IO	umes siot whe	reading	multiple cards:				Stay Quiet	
,	APDU	0A000	084000008						APDU Channe	1
Flag	0x22	•	Block Addr	2	• 0000000	0			Read Block	
NOT	E: Default Fl	ag =0x22 .	you need UID f	or all oper	ations: 1122334	4			Write Block	
	For single	card oper	ation,there is no	need to a	lo Inventory firstly!				Lock Block	
									Write AFI	
AFI				Attention:	Be careful when do	LockAFI, this i	s one time operat	tion!!	Lock AFI	
DSFID	-			Attention	Pa coroful when do	LookDSEID th	n in one time one	ration	Write DSFID	
				Allenbon.	De careiur mien uu	LOUND OF ID, UI	a la one unie ope		Lock DSFID	
									GET Card Info	
Protoco	Screen									
>> 50 0 << 50 0 >> 50 0 << 50 0 >> 50 0 << 50 0 << 50 0 << 50 0	0 03 A1 06 0 08 A1 B7 0 09 A6 22 0 02 A6 00 0 0B A3 22 0 06 A3 00 0 0A A5 22 0 02 A5 00	00 00 F 91 F3 A B7 91 F 00 F4 02 01 E 00 00 0 02 B7 9 00 F7	4 &8 00 01 04 E -3 A8 00 01 04 -success 87 91 F3 A8 0 0 00 00 F5 11 F3 A8 00 0 -success	0 61s 4 E0 45 0 01 04 success 1 04 E0	uccess E0 41 47					*

2.10.7 ISO15693-Lock Block

To lock the specific block address

Parameters to be optional:

Flag: 0x22 or 0x02, refer to datasheet of using card

Block Addr: the block address to be locked

UID number B791F3A8000104E0	rd at
UID number B791F3A8000104E0 UID number B791F3A8000104E0 UID number Use 16 times Slot Inventory Select Car Stay Quie APDU 0A000084000008 APDU Chan Flag 0x22 Block Addr 2 00000000 Read Bloc 11223344 Utite Bloc	rd et
NOTE: Checkmark "Use 16 times Slot" when reading multiple cards! Select Car APDU 0A000084000008 Flag 0x22 Block Addr 2 11223344 Write Block	rd et
APDU 0A000084000008 Stay Quie Flag 0x22 ▼ Block Addr 2 11223344 Write Block	et inel
APDU 0A000084000008 APDU Chan Flag 0x22 Block Addr 2 00000000 Read Block 11223344 Write Block Write Block 11223344 Write Block	inel
Flag 0x22 Block Addr 2 00000000 Read Block 11223344 11223344 Write Block 11223344 </th <td>iner</td>	iner
11223344 Write Bloc	:k
NOTE: Default Flag =0x22, you need UID for all operations; T1223344	:k
For single card operation, there is no need to do Inventory firstly!	k
Write AF	
AFI Attention: Be careful when do LockAFI, this is one time operation!! Lock AFI	
DSFID Attention: Be careful when do LockDSFID this is one time operation!	ID
Lock DSFI	D
GET Card In	nfo

2.10.8 ISO15693-Write AFI

AFI=Application Family Identifier, which it's a 8-bit value and located at Byte 2 in Block -2 ,and it allows for example the creation of label families.

For details please refer to ISO 15693-3.

stem Auto-List Cards	ISO14443A-3/4 MIFA	RE Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	ISO7
SO15693							
UID number B791F3	3A8000104E0		✓ Use	16 times Slo	t	Inventory	
NOTE: Checkmark "Use 16 t	imes Slot" when reading multi	nie cardsi				Select Card	
						Stay Quiet	
APDU 0A0000	8400008					APDU Channe	
Flag 0x22 -	Block Addr 2 🗸	00000000				Read Block	
NOTE: Default Flag =0x22,	you need UID for all operation	s; 11223344				Write Block	
For single card opera	ation,there is no need to do Inv	entory firstly!				Lock Block	
			han			Write AFI	
AFI	Attention: Be c	areful when do Lo	ockAFI, this is o	one time operat	ion!!	Lock AFI	
DSFID	Attention: Pe o	anaful mbaa da Lu			estion all	Write DSFID	
	Allenborr, De Ca	sreiur wien oo Lo	uns i	s one une oper		Lock DSFID	
						GET Card Info	
rotocol Screen							
					_		

2.10.9 ISO15693-Lock AFI

For details please refer to ISO/IEC 15693-3.

system Auto-L	ist Cards	ISO14443A-3/4	MIFARE	Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	IS078
ISO15693									
UID number	B791F	3A8000104E0		3	✓ Use	16 times Slot		Inventory	
NOTE: Checks	ark "lice 16	times Slot" when rear	ling multiple	cordal				Select Card	
WOTE CHECKI	Mark Use 10	unies oloc interread	ing malaple (carus:				Stay Quiet	
APDU	0A000	084000008					F	APDU Channe	1
Flag 0x22	•	Block Addr 2	•	00000000				Read Block	
NOTE: Defaul	Flag =0x22	, you need UID for all	operations;	11223344	-			Write Block	
For sin	gle card oper	ration,there is no need	to do Invento	ory firstly!				Lock Block	
									_
AFI		Atten	tion: Be care	ful when do L	ockAFI, this is c	one time operation	nil 🗧	VVrite AFI	-
DOCID		Atten	tion: Be caref	ful when do L	ockDSFID,this i	s one time operat	tion!!	vvnte DSFID	
DSFID								Lock DSFID	
DSFID								GET Card Info	
DSHD									
Protocol Scree	1								
Protocol Scree	1								
Protocol Scree	1								
Protocol Scree	1								
Protocol Scree	1								
Protocol Screet	1								

2.10.10 ISO15693-Write DSFID

DSFID= Data Storage Format Identifier, which is located at Byte 3 in Block -2.

For details please refer to ISO/IEC 15693-3.

vstem	Auto-List C	ehre'	ISO14443A	-3/4	MIEAR	- Classic	Liltr	alight/C	DESE	re ISO144	43B ISC	015693	15078
ISO1569	3	arus	10011113	(5/4	iviii / u u		Old	angnoo	DECI		100		10010
	umber	B791F:	3A8000104E	0		_		V Use	16 times	Slot	Inv	entory	
NOTE	Chaolimarki	Nine 46	times Clatt uks		n a multiple	and at					Sele	ct Card	
NOTE	Спесктагк	USE 161	imes Siot' whe	n readi	ng muluple	cards!					Sta	y Quiet	
A	PDU	0A0000	084000008								APDU	Channe	1
Flag	0x22 -		Block Addr	2	•	0000000)				Rea	d Block	
NOTE	E Default Flag	=0x22,	you need UID (for all o	perations;	11223344	.				Write	e Block	
	For single ca	ard open	ation,there is n	o need	to do Inven	tory firstly!					Loci	k Block	
				an de							Wr	ite AFI	
AFI				Attenti	ion: Be care	eful when do i	LockA	FI, this is c	one time o	peration!!	Loc	ck AFI	
DSFID				Attenti	on: Be care	eful when do l	LockE	SFID,this i	s one time	operation!!	Write	DSFID	
											Lock	DSFID	
											GET	Card Info	
Protocol	Screen												
													4
													_
											C	lear	

2.10.11 ISO15693-Lock DSFID

For details please refer to ISO/IEC 15693-3.

	Auto List Cards	100111120 2/4		Liltraliaht/C	DECEira	100111120	15015693	100704
system	Auto-List Cards	15014443A-3/4	WIFARE Classic	Oltralignt/C	DESFILE	150144430	10010000	150701
ISO156								
UID	number B791	F3A8000104E0		👻 🔽 Use	16 times Slot	t 📃	Inventory	
NOT	E: Chackmark Mise 1	6 times Slot" when read	ing multiple certal				Select Card	
NOT	L Checkinark Use I	o unies sioc mien readi	ng mulipe caras:				Stay Quiet	
,	APDU 0A00	0084000008				ł	APDU Channel	
Flag	0x22 -	Block Addr 2	- 0000000	0			Read Block	
NOT	TE: Default Flag =0x2	2 , you need UID for all c	operations; 11223344	4			Write Block	
	For single card ope	eration,there is no need	to do Inventory firstly!				Lock Block	
							Write AFI	
AF		Attent	ion: Be careful when do	LockAFI, this is (one time operati	on!!	Write AFI Lock AFI	
AF		Attenti	ion: Be careful when do	LockAFI, this is (one time operati	on!!	Write AFI Lock AFI Write DSFID	
AF	i	Attenti	ion: Be careful when do ion: Be careful when do	LockAFI, this is (LockDSFID,this i	one time operati is one time oper	on!!	Write AFI Lock AFI Write DSFID Lock DSFID	
AF		Attenti	ion: Be careful when do ion: Be careful when do	LockAFI, this is (LockDSFID,this i	one time operati is one time oper	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	
AF		Attent	ion: Be careful when do ion: Be careful when do	LockAFI, this is (LockDSFID,this i	one time operati is one time oper	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	
AF DSFIE	I	Attent	ion: Be careful when do ion: Be careful when do	LockAFI, this is (LockDSFID,this i	one time operati	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	
AF DSFIE	I Screen	Attent	ion: Be careful when do ion: Be careful when do	LockAFI, this is (LockDSFID,this i	one time operati	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	
AF DSFIE Protoco	l Screen	Attent	ion: Be careful when do ion: Be careful when do	LockAFI, this is (one time operati	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	
AF DSFIE Protoco	I	Attent	ion: Be careful when do ion: Be careful when do	LockAFI, this is (LockDSFID,this i	one time operati	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	
AF DSFIE Protoco	l	Attent	ion: Be careful when do ion: Be careful when do	LockAFI, this is (one time operati	on!!	Write AFI Lock AFI Write DSFID Lock DSFID GET Card Info	

2.10.12 ISO15693-Get Card Info

System	Auto-List Cards	ISO14443A-3/4	4 MIFAR	E Classic	Ultralight/C	DESFire	ISO14443B	ISO15693	IS0781
ISO15693	3				-				
	mber B791	F3A8000104E0			🗸 🔽 Use	16 times Slot		Inventory	
NOTE		10 times Clatt when re						Select Card	
NOTE	Checkmark Use	io times Siot, when re-	ading muluple	Cards!				Stay Quiet	
AF	DU 0A00	00084000008						APDU Channel	
Flag	0x22 -	Block Addr 2	•					Read Block	
NOTE	Default Flag =0x2	2 , you need UID for a	Il operations;	11223344	-			Write Block	
	For single card op	peration,there is no ne	ed to do Inven	tory firstly!				Lock Block	
								Write AFI	
AFI	00	Atte	ention: Be care	eful when do l	ockAFI, this is c	one time operation	on!!	Lock AFI	
DSFID	00	Atte	ention: Be care	eful when do l	ockDSEID this i	s one time onen	ation!	Write DSFID	
								Lock DSFID	
								GET Card Info	
Protocol	Screen								
>> 50 00 << 50 00 >> 50 00 << 50 00	03 A1 06 00 00 08 A1 B7 91 F3 09 A6 22 B7 91 02 A6 00 00 F4	F4 A8 00 01 04 E0 6 F3 A8 00 01 04 E success	1success 0 45	S					*
>> 50 00	09 AC 22 B7 9 10 AC 00 00 0F	1 F3 A8 00 01 04 E 5 B7 91 F3 A8 00 0	0 4F 1 04 E0 00	00 1B 03 0	1 62succes	s			
							_		_

Other functions not on above listing or any other specific request about our device, please contact our sales person or technical engineers for support, THANK YOU.

Contact information:

SHENZHEN CHIKEK Intelligent TECH CO.,LTD

Room 210, 2nd Bldg, WanYuan Commercial Building, 71th District, XinAn Street, BaoAn, 518101, SHENZHEN

TEL: 86-755-23766242 -803 FAX: 86-755-23571242 Email: sales@chikek-rfid.com , <u>support@chikek-rfid.com</u> Website: <u>www.chikek-rfid.com</u>

FCC statement

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 undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

--Reorient or relocate the receiving antenna.

--Increase the separation between the equipment and receiver.

--Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

--Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.