Version:

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User Manual HF Module OEM-HF-890



1. Introduction

This testing demo is usable for any kinds of readers with TTL or RS232 interface, and support to operate read/write cards compliant with ISO/IEC 14443A/B, ISO/IEC 15693 Standards, etc.

This DEMO is just for testing used, other specific app or request on function button, please refer to API documents, demo code and other second development files for your own program, or contact our sales for customization.

Remark: For USB-Com reader, before using this demo, please install the driver included

on the file package, no need for RS232/TTL module.

2. Operation procedure

2.1 Connection

Here taken Testing on PC side by using tool of RS232 DB9 connector

Please refer to the PIN definition of different modules, which shown as below:



Product Photo

PIN Definition

PIN Definition	RS232 Port
J1-PIN1	NC
PIN2	NC
PIN3	BUZ
PIN4	LEDG
PIN5	LEDR
J2- PIN1	RESET
PIN2	232-RX
PIN3	232-TX
PIN4	GND
PIN5	+5V(DC)
J3-PIN1	ANTENNA-
PIN2	ANTENNA+



Connect RS232 connector to PC, and check if the device be recognized, please look for the right COM Port number for connection in menu of "Device manager" Remark: if failed, there will be no according device display

2.2 System parameter setup

After succeed in hardware connection, please open SW of "DEMO" and the port

matching up, as following picture:

System ISO14443-TypeA Ultralight CPU	ISO14443-TypeB ISO15693	
Connection Port: COM1 COM1 Baudrate: COM1 Disconnect Disconnect	Setting Device Address Address: 00 Device Baudrate Baudrate: 9500 S/N: 00 00 00 00 00 00 01	Set Set
Information SW Version HW Version Device S/N	- Message	
Buzzer & LED Buzzer: OA (times) 18 (duration) Execute LED: OA (times) 18 (duration) Execute		Clear

Then please click " Connect" to build up communication port, and feedback displaying according device information and Message box, as below:

System 📕 ISO14443-TypeA 📕 UltraLight 📕 CPU	ISO14443-TypeB ISO15693	
Connection Port: COM6 Baudrate: 9600 Disconnect	Setting Device Address Address: 00 Device Baudrate Baudrate: 9600	Set Set
Device Addr:]00	Device S/N S/N: 00 00 00 00 00 00 00 01	Set
SW Version I0T V213-2.0 HW Version RDM530-S-E+S50570ULT-V4.0-ID Device S/N FF FF FF FF FF FF FF FF FF	Message > Connect < <connect success!<br="">2010 0 85 1575005</connect>	
Buzzer & LED Buzzer: 0A (times) 18 (duration) Execute LED: 0A (times) 18 (duration) Execute		Clear

In this system setup, there are function button for changing working mode of Buzzer and LED, detail command definition and format, please refer to document of API parameter.

Also you could setup the address of the device and serial number in this operation interface.(note: this is only used when there are multiple device working together).

2.3 ISO14443 Type A operation

2.3.1 ISO14443A Search card

Please enter to "ISO14443A Type A" operation interface, and click "Search" to look for

cards in the reading field, then get back UID of the card if succeed, shown as:

Search / Hait	_ Initialize
• Idle C All	Idle KeyA Sector: O1 KEY: FF FF FF FF FF
	C All C KeyB Value: 64 00 00 00 Initialize
Halt	Increment
Halt	Idle KeyA Sector: O1 KEY: FF FF FF FF FF FF
	C All C KeyB Value: 01 00 00 00 Increase
tead/Write	Decrement
Read	Idle KeyA Sector: Idle KEY: FF FF FF FF FF
G Idle ● KeyA Blocks: 01 KEY: FF FF FF FF FF FF	C All C KeyB Value: 01 00 00 00 Decreas
	Message
All C Keyb Addr: 10 Adio Read	<<82 F4 F4 3D one card be detected
Write	2013-8-8 15:05:25
G Idle	
CAII C KeyB Addr: 10 C Auto Write	

2.3.2 Card Halting operation

This process is to halt card:

ystem wode select help	
System System System System System	ISO14443-TypeB I ISO15693
Search / Halt	E-wallet Initialize I Idle I KeyA Sector: 01 KEY: FF FF FF FF FF FF FF
State State	C All C KeyB Value: 64 00 00 00 Initialize
Halt	Increment C Idle C KeyA Sector: 01 KEY: FF FF FF FF FF FF
she iteratorijo	C All C KeyB Value: 01 00 00 00 Increase
Read/Write	Decrement
Read	
G Idle	C All C KeyB Value: 01 00 00 00 Decrease
C All C KeyB Addr: 10 T Auto Read	Message > ≻Hait < <hait success!<br="">2013-7-31 18:14:30</hait>
G Idle C KeyA Blocks: 01 KEY: FF FF FF FF FF FF FF	
C All C KeyB Addr: 10 Auto Write	
FF	

2.3.3 Read data of card blocks

To operate card blocks information reading, card supporting types can be Mifare 1K,

Mifare 4K, and the working mode optional with Idle mode and All mode.

Remark:

Under idle mode, all cards in the IDLE state shall respond synchronously with ATQA Under All mode, all the card in the IDLE or HALT state shall respond synchronously with

ATQA.

"Blocks "dialog box stands for the blocks number to be read in one time, and the "Addr" is the start address of this reading, the "KEY" default is FF FF FF FF FF.

If the reading block/blocks is/are encrypted, please get and input the special key, see following:

If successfully, then Message box will return right information about the operation; if

failed, then feedback with wrong code, please refer to Wrong code list to know their

definition.

earch / Halt	E-wallet
Search Card	Initialize
Idle C All Search	
調准要因公司	C All C KeyB Value: 64 00 00 00 Initialize
Halt Lips 2ipg	Increment 6 jpg 6 jp
Halt	Idle · KeyA Sector: 01 KEY: FF
blocks number	All C Reyb Value: 01 00 00 00 Increase
ead/Write	Decrement
Read	
• Idle • KeyA Blocks: 01 KEY: FF FF FF FF FF FF	C All C KeyB Value: 01 00 00 00 Decrease
	Message
Auto Read	< <uid: 3d<="" 82="" f4="" td=""></uid:>
Write start address	< <data: 00="" 00<="" td=""></data:>
	2013-8-8 11:25:08
Idie (* KeyA BIOCKS: UI KEY: FF FF FF FF FF	
C All C KeyB Addr 10 C Auto Write	
	information return
FF AA BB	
A ANTELLA	

2.3.4 Write data into card blocks

To operate card blocks information writing, card supporting types can be Mifare 1K, Mifare 4K, and the working mode optional with Idle mode and All mode.

Remark:

Under idle mode, all cards in the IDLE state shall respond synchronously with ATQA Under All mode, all the card in the IDLE or HALT state shall respond synchronously with ATQA.

"Blocks "dialog box stands for the blocks number to be written in one time, and the

"Addr" is the start address of this writing , the "KEY" default is FF FF FF FF.

If the writing block/blocks is/are encrypted, please get and input the special key, see following:

If successfully, then Message box will return right information about the operation; if failed, then feedback with wrong code, please refer to Wrong code list to know their definition.

Search / Halt	E-wallet
Search Card	Initialize
© Idle C All	earch Generation (* Idle (* KeyA Sector: 01 KEY: FF FF FF FF FF FF FF
	C All C KeyB Value: 64 00 00 00 Initialize
Halt	Increment
	Halt G Idle G KeyA Sector: 01 KEY: FF
	C All C KeyB Value: 01 00 00 00 Increase
Read/Write	Decrement
Read	
G Idle	FF FF FF FF C All C KeyB Value: 01 00 00 00 Decreas
CAll C KeyB Addr: 10 ☐ Auto	Read >>Reading Start Address:10 Blocks:01 data after wr
when he	< <<01D: 82 F4 F4 3D <<data: 11="" 11<="" td=""></data:>
blocks humbe	2013-8-8 11:27:20
Ger MeyA Blocks: 01 KEY: FF FF FF	FF FF FF
	<82 F4 F4 3D Writing Success!
C All C KeyB Addr: 10 Auto	2013-8-8 11:27:17
start addre	SS
	information return

2.3.5 E-Wallet operation

Here in this demo, we just provide a simple operation interface, to demonstrate the using procedure of E-wallet, which including initialize, increment, decrement, detail operating sectors and value command, please refer to use manual of the card.

System 📕 ISO14443-TypeA 📓 UltraLight 📕 CPU 📔	ISO14443-TypeB	93	
earch / Halt	E-wallet		
Search Card	_ Initialize		
G Idla C All	Idle	r: 01 KEY:	FF FF FF FF FF FF
	C All C KeyB Value	: 64 00 00 00	Initialize
Halt			
Halt		r: 01 KEY:	FF FF FF FF FF FF
	C All C KeyB Value	: 01 00 00 00	Increase
ead/Write	Decrement		
Read		r: 01 KEY:	FF FF FF FF FF FF
Gerald Control Contro	C All C KeyB Value	: 01 00 00 00	Decrease
	Message		
C All C KeyB Addr: 10 ☐ Auto Read			
Write			
← Idle ← KeyA Blocks: 01 KEY: FF FF FF FF FF FF FF			
CAII C KeyB Addr: 10 T Auto Write			
FF AA BB			
-			

2.4 Ultralight operation

2.4.1 Search Mifare Ultralight

This procedure is need before reading or writing any specific page, just Click the

"Search", then you will get the CardID displaying in Message box, shown as below:

Search / Halt		Write		
G Idle C All	10x NY 100	Search Page0:	Page8:	
CardID: 04 D2 19 0/	A 19 27 80	Page1:	Page9:	
	Ciebe Receipe	Halt Page2:	Page10:	
Read		Page3:	Page11:	
		Page4:	Page12:	
Page0:	Page8:	Page5:	Page13:	
Page1:	Page9:	Page6:	Page14:	
Page2:	Page10:	rageo.		
Page3:	Page11:	Page/:	Page15:	
Page4:	Page12:	Page: 0	<u>−</u> 00	Write
		-Message >>Search	ning Mode:Idle	
Page5:	Page13:	<<04 D2 2013-7-30	19 0A 19 27 80 Searching Succe 0 19:40:29	ss!
Page6:	Page14:			
Page7:	Page15:		information retur	n

2.4.2 Read data of page

Please choose the page number in the drop-down list box, then click "Read", then get

the information of the paged chosen.



			602
System ISO14443	-TypeA	15014443-Турев 🔟 15015	093
Search / Halt		Write	
• Idle C All	Searc	h Page0:	Page8:
CardID: 04 D2 19 0A :	19 27 80	Page1:	Page9:
	Halt	Page2:	Page10:
lead	r r	Page3:	Page11:
Page0:	Page 8: 48 BE 15 04	Page4:	Page12:
Pageo.		Page5:	Page13:
Page1:	Page9:	Page6:	Page14:
Page2:	Page10:	Page7:	Page15:
Page3:	Page11:	Page: 00	- Wri
Page4:	Page12:	Message	
Page5:	Page13:	>>Reading Page: < <a8 04="" 1f="" be="" r<="" td=""><td>08 eading Success!</td></a8>	08 eading Success!
Page6:	Page14:	2013-7-30 19:42:10	
Page7:	Page15:	>>Searching Mod <<04 D2 19 0A 19 2 2013-7-30, 19:41:57	7 80 Searching Success!
Page 08			

2.4.3 Write data of page

To write information to the page, select the page number to be written under drop-down

list box, input data need to be written into (4 bytes), then click "Write".

To check out if the writing success, you could see the information return in the Message

box, also you could operate to read the page just wrote , shown as below:



3 CPU card operation

This interface is used for contactless CPU cards compliant with ISO 14443A standard,

here we provide three function button, including RATS(Request for Answer to Select),

RST ANT (Reset Antenna) and Send APDU.

These three function are fit for all common types of contactless CPU card,

tem Mo	ode Select Help		_			
System	ISO14443-TypeA	UltraLight	CPU	ISO14443-1	ypeB 📕 ISO15693	
Reque	d Operates			RATS RST ANT	Message >>RATS <10.78 80 90 02 20 90 00 00 00 RATS Success! 2013-7-30 19:45:31	10 00 96 68 57 44
-COS C	ommand Data :	20130720 20130720 20130720				
00 84	00 00 08			APDU		
mail			Ŧ			Clea

Sustan Mode Select Help	014442 T
System ISO14445-TypeA ISO14445-TypeA ISO	214445-19peb a 15013035
CPU Card Operates	Message >>APDU:00 84 00 00 08 < <c4 00<br="" 09="" 15="" 1e="" 2d="" 31="" 90="" b1="" dc="">2013-7-30 19:45:58</c4>
RATS	>>RATS <10 78 80 90 02 20 90 00 00 00 00 00 96 68 57 44 RATS Success! 2013-7-30 19:45:31
RST AN	T
COS Command	
Send Data :	
00 84 00 00 08	
APDU	
	Clear

4 ISO14443 Type B

Detail operation, there is other demo to do it.

5. ISO15693 Operation

5.1 Inventory

To search the card or cards in the reading field,

Cond (M/	aru				- Sustam Info	
Pood AM		115 1	☐ Auto	Inventory	Flag: 02 UID:	GetSysI
	rite					C
Read				00000	Secure Into	_
Flag:	02	Addr: 01	Blocks: 05	ReadPlack	Flag: 02 Addr: 00 Blocks: 05	GatSacu
UID:				Readblock	UID:	
Write					- Transmit Command	
Flag:	02	Addr: 05	Blocks: 01			DataTran
UID:	el manento -	Data: 11 11	11 11	WriteBlock	Length 102 Data: 02 28	Patarran
-Lock-		- da ' g	indu and		Message	
Flag:	02	Block: 05		LockBlock	<uid1:e0 00="" 01="" 04="" 24="" 7b="" ce<="" eb="" td=""><td></td></uid1:e0>	
Write &	Lock (AFI	DSFID)			1 card be detected)
AFI]		
Flag:	02 UID:		AFI: 06	Write_AFI		
Flag:	02 UID:			Lock_AFI		
DSFID						
Flag:	02 UID:		DSFID: 08	Write_DSFID		
Flag:	02 UID:	station 9	el ili	Lock_DSFID		
15693 G	eneral Comm	nands				
10000 01	eneral comm	iuna s		Stay_Quiet		
et	22 100	PS -		- Calast		
Flag:	22 010:			Select		

5.2 Read block

To read data of the block

Please refer to user manual of different chip cards, to get the Flag value, then input the

right one, and chose the start address and blocks number to be read.

Following is the example for the I CODE SLI chip cards, the Flag value is 02, as

following:

ISC	D15693 Command Search Card	block	s number	System Info & Secure Info System Info Flag: 02 UID:	GetSvsIr
E	Read/Write	t dddress			
	Read Flag: 02 UID:	Addr: 01 Blocks: 05	ReadBlock	Flag: 02 Addr: 00 Blocks: 1	05 GetSeculi
	Write Flag: 02 UID:	Addr: 05 Blocks: 01 Data: 11 11 11 11	WriteBlock	Transmit Command Length 02 Data: 02 2B	DataTran
	Lock Flag: 02	Block: 05	LockBlock	-Message >>ReadBlock Flags:02 StartAddr:01 Bl <<00 00 00 00 00 00 00 00 00 00 00 00 00	ocks:05 0 00 00 00 11 11 1:
F	Write & Lock (AFI	DSFID)		11	
	AFI Flag: 02 UID:	AFI: 06	Write_AFI	2010 0 9 2112200	
	DCEID		LOCK_AFI		
	Flag: 02 UID:	DSFID: 08	Write_DSFID		
	Flag: 02 UID:		Lock_DSFID		
	15693 General Comr	mands			
			Stay_Quiet		
-1	Flag: 02 UID: Flag: 02 UID: 15693 General Comr	DSFID: 08	Write_DSFID Lock_DSFID Stay_Quiet		

5.3 Write block

To write data of the block

Please refer to user manual of different chip cards, to get the Flag value, then input the

right one, and chose the start address and blocks number to be written.

Following is the example for the I CODE SLI chip cards, the Flag value is 02

oyotom		o typen a oldalight		13013055	
Read/W Read/W Read Flag: UID:	Command Card /rite	Aut	ReadBlock	System Info & Secure Info System Info Flag: 02 UID: Secure Info Flag: 02 Addr: 00 Blocks: 05 UID:	GetSysInf
-Write Flag: UID: -Lock-	02	Addr: 05 Blocks: 01 Data: 11 11 11 11	WriteBlock	Transmit Command Length 02 Data 02 28 Message >>WriteBlock Flags:02 StartAddr:05 Blocks:	DataTransi 01
Write 8	02 & Lock (AFI 1	DSFID)	LockBlock	< < Writing Success ! 2013-8-9 21:54:38	
Flag:	02 UID:	AFI: 0	5 Write_AFI Lock_AFI		
DSFID					
Flag:	02 UID:	DSFID: 0	8 Write_DSFID		
Flag:	02 UID:		Lock_DSFID		
15693 (General Comm	ands	Stay_Quiet		

5.4 Lock block

Here needed to input the right Flag of the using card and choose the blocks number to be locked.

Attention: if the block locked, rewriting for these blocks will be not available any more.

system a 150.	4443-TypeA 🔳 UltraLight I	CPU SIG014443-	TypeB 📕 ISO15693	
ISO15693 Comma	d	Sy	stem Info & Secure Info	
(Attention	(Insertion) -	UID:	GetSysIn
Read/Write Read Flag: 02 UID:	Rewriting will be not	available if the block loo	cked ! Addr: 00 Block	5: 05 GetSeculi
Write				
Flag: 02		确定	取消 Data 02.2B	DataTrans
UID:				
Flag: 02	Block: 05	LockBlock 20	WriteBlock Flags:02 StartAddr:05 Writing Success ! 13-8-9 21:54:38	Blocks:01
Flag: 02 UI	D: AFI: 06	Write_AFI		
	D:	Lock_AFI		
Flag: 02 UI	1			
Flag: 02 UI				
Flag: 02 UI DSFID Flag: 02 UI	DSFID: 08	Write_DSFID		
Flag: 02 UI DSFID Flag: 02 UI Flag: 02 UI	DSFID: 08	Write_DSFID Lock_DSFID		
Flag: 02 UI DSFID Flag: 02 UI Flag: 02 UI 15693 General C	D: DSFID: 08 D: DSFID: 08	Write_DSFID Lock_DSFID		
Flag: 02 UI DSFID Flag: 02 UI Flag: 02 UI Flag: 02 UI	D: DSFID: 08	Write_DSFID Lock_DSFID Stay_Quiet		

5.5 Write & Lock (AFI/DSFID)

Please refer to the ISO15693 standard.

5.6 ISO15693 General Commands

5.6.1 Stay_Quiet

To make the card to be slept

5.6.2 Select

To select the single card on the reading field

5.6.3 RST to Ready

To wake-up the single card be stay_quiet

5.7 System info & Secure info

This is to get the system & secure information of the card, here this testing demo is available with three buttons of "GetSysInfo", "GetSecurInfo" and "Data Transmit"

Other incomplete functions or operation, please refer to API document for reference and develop the own software accordingly.

Federal Communication Commission Statement (FCC, U.S.)

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 a 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 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. 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.

FCC Caution:

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

IMPORTANT NOTES

Co-location warning:

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

OEM integration instructions:

This device is intended only for OEM integrators under the following conditions:

The module may not be co-located with any other transmitter or antenna. The module shall be only used with the original antenna(s) that has been originally tested and certified with this module.

As long as the above conditions are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.). Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:

This transmitter module is authorized only for use in device where the module is completely used without any changes, and without any other modules. The final end product must be labeled in a visible area with the following: "Contains Transmitter Module FCC ID: S6A-HF-M890".

Information that must be placed in the end user manual:

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

- English: "

This device complies with Industry Canada licence-exempt RSS stand ard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device."

- French:"

Le présent appareil est conforme aux CNR d'Industrie Canada applica bles aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil nedoit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en

compromettre le fonctionnement."

Industry Canada Statement:

This device complies with RSS-210 of the Industry Canada Rules. Operation is subject to the following two conditions: 1) this device may not cause interference and 2) this device must accept any interference, including interference that may cause undesired operation of the device.

IC Radiation Exposure Statement: This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment.

Avis d' Industrie Canada
Cet appareil est conforme à la norme CNR-210 des règlements d'
Industrie Canada. Son
fonctionnement est sujet aux deux conditions suivantes:
1) Cet appareil ne doit pas provoquer d' interférences et
2) Cet appareil doit accepter toutes les interférences, y compris celles pouvant entraîner son dysfonctionnement.
Avis d' Industrie Canada sur l' exposition aux Rayonnements: Cet appareil est conforme aux limites d' exposition aux rayonnements d'

Precaución para los usuarios:

Los cambios y las modificaciones no aprobadas expresamente por la parte responsable del cumplimiento podrían invalidar la autoridad del usuario a utilizar este equipo.

Nota: Este equipo ha sido probado y es compatible con los límites de un dispositivo digital de Clase B, según el párrafo 15 del Reglamento de FCC. Dichos límites han sido definidos con el fin de proporcionar una protección razonable contra interferencias perjudiciales en una instalación residencial. Este equipo genera, utiliza y puede irradiar energía en radiofrecuencia y, si no se instala y utiliza de acuerdo con las instrucciones, podría provocar interferencias perjudiciales en la recepción de ondas de radio o televisión, lo cual puede determinarse apagando y encendiendo el equipo. Animamos al usuario a intentar corregir las interferencias llevando a cabo una o más de las siguientes medidas:

- Reorientar o colocar la antena receptora en otro lugar.
- Aumentar la separación entre el equipo y el receptor.
- Conectar el equipo a un enchufe perteneciente a un circuito distinto al que pertenece el enchufe al que está conectado el receptor.
- Consulte a su proveedor o a un técnico experimentado en radio /TV para más información.