YHY502C new commands

New commands：

1、Test_Com；
2、MConfigure；
3、Load_key；
4、ChangeKey；
5、Lock/Unlock Sector；
6、Sector_Read；
7、Sector_Write。

Description：

1、 Test_Com

This command is use to test the RS232 communication. If succeess the module will send back the same string to the host.

Table 1. Command--:Host →YHY502

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	Len	0x00	N bytes	BCC

Table 2. Response--: YHY502→Host

Receive	Head	Length	Status	Data	XOR Checksum
Success	0xAA 0xBB	Len	0x00	N bytes	BCC
Failure					

Table 3. Example

Send	**AA BB 09 00 *01 02 03 04 05 06 07 09***	
Description	AA BB	*Head*
	09	*Length*
	00	*COMMAND*
	01..07	*data*
	09	*BCC*
Receive(Success)	**AA BB 09 00 *01 02 03 04 05 06 07 09***	
Description	AA BB	*Head*
	09	*Length*
	00	*status*
	01..07	*data*
	09	*BCC*
Receive(Failure)		

Description		*No response or unknown data*

2、 MConfigure

This command will configure parameters to the YHY522. After Reset YHY522 the configuration will active.

Table 4. Command--:Host →YHY502

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	0x12	0x04	Configure data: 16 bytes	BCC

Configure data: 16 bytes.

Table 5. Configure data

D[0]	D[1]	D[2..7]	D[8]	D[9]	D[10]	D[11]	D[12]	D[13]	D[14]	D[15]
RFU	RFU	RFU	RFU	RFU	RFU	RFU	RFU	Auth Mode	RFU	Baud Code

D[13]:Auth mode -----

Define the auth mode----

0— Auth directly from host, default mode

1— The YHY522 will use the downloaded keys to authentication card

For example:

send：AA BB 12 **04** 01 00 FF FF FF FF FF FF 00 00 00 00 00 01 00 05 13 // auth mode 1

send: AA BB 12 04 01 00 FF FF FF FF FF FF 00 00 00 00 00 00 00 05 12 // auth mode 0

3、 Download_Keys

This command can load up to 40 groups keys to the YHY522's EEPROM, all the data stored in the EEPROM is encrypted. When **auth mode** is **1**, the reader will use the EEPROM's key to auth the card. After reset this keys will active.

Table 6. Command--: Host →YHY502

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	0x09	0x05	7 bytes Sector: 1 byte	BCC

				Keys: 6 bytes	

Sector: 0—0x27 (mifare 4 k card has 40 sectors)

Keys: KeyA or KeyB, default FF FF FF FF FF FF.

Table 7. Response--: YHY502→Host

Receive	Head	Length	Status	Data	XOR Checksum
Success	0xAA 0xBB	0x02	0x05		0x07
Failure	0xAA 0xBB	0x02	0xFA		0xF8

Table 8. Example

Send	**AA BB 09 05 01 FF FF FF FF FF FF 0D**	
Description	AA BB 09 05 01 **FF FF FF FF FF FF** *0D*	*Head* *Length* *COMMAND* *Sector 01* *Key* *BCC*
Receive(Success)	**AA BB 02 03 *01***	
Description	AA BB 02 05 *07*	*Head* *Length* *Status* *BCC*
Receive(Failure)	**AA BB 02 FC *FE***	
Description	AA BB 02 FA *F8*	*Head* *Length* *Error* *BCC*

FF FF FF FF FF FF：Default key in the blank card

4、 Change_Card_Keys

This command will change the card's authentication keys. The card needs to be put on the field when performing this action.

Table 9. Command--:Host →YHY522

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	0x1A	0x06	Key Info: 24 bytes	BCC

Key Info: Key type +Sector number + Old Key + New Key + Key A+ Access bits + Key B

Key type: 1 byte, 0x00—Key A, 0x01—Key B.

Sector number: 1 byte, 0x00..0x27 (0..39)

Old Key: 6 bytes, default “FFFFFFFFFFFF” (*)

Key A: 6 bytes new key

Access bits: 4 bytes---‘ FF 07 80 69’

Key B: 6 bytes ----default ‘FF FF FF FF FF FF’

(*)Note: If auth mode is “1”, then this key is not active, it can be any 6 data bytes.

Table 10. Response--: YHY522→Host

Receive	Head	Length	Status	Data	XOR Checksum
Success	0xAA 0xBB	0x02	0x06		0x04
Failure	0xAA 0xBB	0x02	0xF9		0xFB

Table 11. Example

Send	**AA BB 1A 06 00 08 FF FF FF FF FF FF 00 11 22 33 44 55 FF 07 80 69 FF FF FF FF FF FF 14 (*)**	
Description	AA BB	*Head*
	1A	*Length*
	06	*COMMAND*
	00	*Key type A*
	08	*Sector 08*
	FF FF FF FF FF FF	*Old Key*
	00 ..55	*New key*
	FF 07 80 69	*Access bytes*
	FF FF FF FF FF FF	*Key B*
	30	*BCC*
Receive(Success)	**AA BB 02 06 04**	
Description	AA BB	*Head*
	02	*Length*
	06	*Status*
	04	*BCC*
Receive(Failure)	**AA BB 02 F9 FB**	
Description	AA BB	*Head*
	02	*Length*
	F9	*Error*
	FB	*BCC*

5、 LOCK_Card

This command will LOCK/UNLOCK the appointed sector. Once the sector is **LOCK**, all the blocks can only read or decrement. The user need to use the **key A** to authenticate the card. The card needs to be put on the field when performing this action.

Table 12. Command--:Host →YHY522

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	0x0A	0x07	Lock Info: 8 bytes	BCC

Lock Info: Sector number + Key A + LOCK/UNLUCK

Sector number: 1 byte, 0x00..0x27 (0..39)

Key A: 6 bytes, default "FFFFFFFFFFFF" (*)

LOCK/UNLUCK: 0x00---LOCK; 0x01---UNLOCK

(*)Note: If auth mode is "1", then this key is not active, it can be any 6 data bytes.

Table 13. Response--: YHY522→Host

Receive	Head	Length	Status	Data	XOR Checksum
Success	0xAA 0xBB	0x02	0x07		0x05
Failure	0xAA 0xBB	0x02	0xF8		0xFA

Table 14. Example

Send	**AA BB 0A 07 08 FF FF FF FF FF FF 00 05**	
Description	AA BB	*Head*
	0A	*Length*
	07	*COMMAND*
	08	*Sector to be LOCK/UNLOCK*
	FF FF FF FF FF FF	*Key*
	00	*LOCK*
	05	*BCC*
Receive(Success)	**AA BB 02 07 05**	
Description	AA BB	*Head*
	02	*Length*
	07	*Status*
	05	*BCC*
Receive(Failure)	**AA BB 02 F8 FA**	
Description	AA BB	*Head*
	02	*Length*
	F8	*Error*
	FA	*BCC*

6、 Sector_Read

This command reads data from the appointed sector. One sector has 3

blocks(48 bytes, sector 0 to 31) or 15 blocks(240 bytes, sector 32 to 39) . This command would not read the tailor block.

Table 80. Command--:Host →YHY522

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	0x0A	0x2A	Sector Info: 8 bytes	BCC

Sector Info: Key type + Sector number + Key

Key type: 1 byte, 0x00—Key A, 0x01—Key B.

Sector number: 1 byte, 0x00..0x27 (0..39) (*)

Key: 6 bytes, default "FFFFFFFFFFFF"

(*)Note: If auth mode is "1", then this key is not active, it can be any 6 data bytes.

Table 15. Response--: YHY522→Host

Receive	Head	Length	Status	Data	XOR Checksum
Success	0xAA 0xBB	Len	0x2A	Sector data: 49/241 Bytes	BCC
Failure	0xAA 0xBB	0x02	0xD5		0xD7

Len:-----

0x33 (51)—if sector is 0-31

0xF3 (243)—if sector is 32-39

Sector data: Sector number(1 byte) + Blocks data(48/240 Bytes)

Table 16. Example

Send	**AA BB 0A 2A 00 *01* *FF FF FF FF FF FF* *21***	
Description	AA BB	*Head*
	0A	*Length*
	2A	*COMMAND*
	00	*Authenticate with Key A*
	01	*Read Sector 01*
	FF FF FF FF FF FF	*Keys*
	21	*BCC*
Receive(Success)	**AA BB 33 2A *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 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 18**	
Description	AA BB	*Head*
	33	*Length*
	2A	*Status*
	01	*Sector 01*
	00 .. 00	*48 Bytes Data of Sector 01*

	18	*BCC*
Receive(Failure)	**AA BB 02 D5 *D7***	
Description	AA BB 02 D5 *D7*	*Head* *Length* *Error* *BCC*

7、 Sector_Write

This command writes 48/240 bytes data to the appointed sector.

One sector has 3 blocks(48 bytes, sector 0 to 31) or 15 blocks(240 bytes, sector 32 to 39) . This command can not write the tailor block and sector 0, sector 0 include block 0 which is read only.

Table 17. Command--:Host →YHY522

Send	Header	Length	Command	Data	XOR Checksum
	0xAA 0xBB	Len	0x2B	Write Info: 48/240 bytes	BCC

Len:-----

0x3A (58)—if sector is 0-31

0xFA (250)—if sector is 32-39

Write Info: Key type +Sector number + Key + SData

Key type: 1 byte, 0x00—Key A, 0x01—Key B.

Sector number: 1 byte, 0x01..0x27 (1..39)

Key: 6 bytes, default “FFFFFFFFFFFF” (*)

SData: 48/240 Bytes data to be write into card

(*)Note: If auth mode is “1”, then this key is not active, it can be any 6 data bytes.

Table 18. Response--: YHY522→Host

Receive	Head	Length	Status	Data	XOR Checksum
Success	0xAA 0xBB	0x02	0x2B		0x29
Failure	0xAA 0xBB	0x02	0xD4		0xD6

Table 19. Example

Send	**AA BB 3A 2B 00 01 *FF FF FF FF FF FF* 11 11 11 11 11 11 11 11 11 11 11 11 11 11 11 22 22 22 22 22 22 22 22 22 22 22 22 22 22 22 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 33 *10***	
Description	AA BB	*Head*
	3A	*Length*
	2B	*COMMAND*
	00	*Key type A*
	01	*Write Sector 01*
	FF FF FF FF FF FF	*Authenticate with Key A*
	11 ..33	*48 bytes data*
	10	*BCC*
Receive(Success)	**AA BB 02 22 *20***	
Description	AA BB	*Head*
	02	*Length*
	2B	*Status*
	29	*BCC*
Receive(Failure)	**AA BB 02 DD *DF***	
Description	AA BB	*Head*
	02	*Length*
	D4	*Error*
	D6	*BCC*

File end.