RFM-13X SERIES

RF CARD READER/WRITER MODULE

CONTENTS

1. OVERVIEW

RFM-13x is a high-power embedded RF card reader/writer module, it can support ISO14443A/B & ISO15693, provide RS232/RS485/TTL/Wigand26 etc interface, and it can be used in access control, public bus etc terminals.

2. BASIC SPECIFICATION

Model	Function	List separator	Interface
RFM-13: 13.56MHz RF card reader/writer module	**0**. Mifare 1 reader/writer **1.** ISO14443A/B **2.** ISO14443A/B & 15693	-	**0**. RS232 **3**. RS485 **5**. TTL **6**. Wiegand

Type	Dimension (W*D*H)	Remark
RFM13x-056	50*100*10 (mm)	RS232/TTL/Wiegand interface
RFM13x-356		RS485/TTL/Wiegand interface

3. SPECIFICATION

Voltage	+5VDC (± 5%)
Current	<150mA
Card type	ISO14443A/B & ISO15693
Distance	0~8cm
Interface	RS232/RS485, TTL, Wiegand
Baud	9600(default)~115200 BPS
Temperature	Operating: 0°C ~ + 60°C Storage: -20°C ~ + 60°C
Humidity	Operating: 5% ~ 95% RH Storage: 20 %~ 90% RH
Dimension	100mm (L) x 50mm (W) x 10mm (H)

4. INTERFACE DEFINITION

4.1 Main connector J1(6*2.0mm)

Used in RS232 or RS485 communication, pinout description:

Pin1 ---- GND

Pin2 ---- VCC (DC+5V)

Pin3 ---- GND

Pin4 ---- RS232.RX or RS485.B

Pin5 ---- RS232.TX or RS485.A

Pin6 ---- GND

4.2 Extend connector J2(8*2.0mm)

Used in TTL or Wiegand communication

Pin1 ---- VCC (DC+5V)

Pin2 ---- GND

Pin3 ---- TTL.RXD

Pin4 ---- TTL.TXD

Pin5 ---- Wiegand.D0

Pin6 ---- Wiegand.D1

Pin7 ---- GPIO0

Pin8 ---- GPIO1

5. COMMUNICATION PROTOCOL

5.1 Protocol format:

STX	ADDR	LEN	CMD/STU	DATA	BCC

STX: Communication start character, 1 byte, 0x02

ADDR: Device Addr, 1 byte, 0 can be used in any addr

LEN: Data length, 1 byte, data length of CMD/STU+DATA

CMD/STU: Command byte (Host->Reader) or Status byte (Reader->Host), 1byte

DATA: Data information, byte is not specified. Can be not existed

BCC: Section checking character, 1 byte, the XOR value of all the bytes except STX, BCC

5.2 Command:

	Function	Send/Return		Date and explain
1	Get Version number	send command	0x21	-
		correct return	0x00	Device version number (the length is not specified)
2	Set Wiegand Mode	send command	0x22	on-off (1 byte)+ alarm mode (1 byte) on-off → =0: turn off Wiegand Mode 　　　　=1: turn on Wiegand Mode alarm mode: alarm control byte in Wiegand Mode 　Bit0 → read auto alarm : 0 = prohibit; 1 = allow 　Bit1 → out control LED and buzzer (via GPIO0 and GPIO1) 　　　0 = prohibit; 1= allow *Note: The setting will be valid after reset*
		correct return	0x00	-
3	Set Baud Rate	send command	0x23	Baud Rate options byte(1byte) Baud Rate options byte → =0: 9600 BPS 　　　　　　　　　　=1: 19200 BPS 　　　　　　　　　　=2: 38400 BPS 　　　　　　　　　　=3: 57600 BPS 　　　　　　　　　　=4: 115200 BPS *Note: The setting will be valid after reset*
		correct return	0x00	-
4	Set Device Addr	send command	0x24	Device Addr (1 byte) Device Addr → 0~255
		correct return	0x00	-
5	Get Device Addr	send command	0x25	-
		correct return	0x00	Device Addr (1 byte)
6	Get Device SNR	send command	0x27	-

		correct return	0x00	Device series number (8 byte)
7	Set RF	send command	0x2A	RF control byte (1 byte) RF control byte → =0 off =1 on
		correct return	0x00	-
8	Device_Control LED control	send command	0x2B	LED1 (1 byte) + LED2 (1 byte) LED1 → =0 turn off LED1 =1 turn on LED1 LED2 → =0 turn off LED2 =1 turn on LED2
		correct return	0x00	-
9	Buzzer_Control	send command	0x2C	Beeping time control byte (1 byte) Beeping time control byte → 1~255, unit:10ms
		correct return	0x00	-
10	Device Reset	send command	0x2D	-
		correct return	0x00	-
11	Request	send command	0x31	Request mode(1byte) Request mode → = 0x52 request all card = 0x26 request card which is not in IDLE status
		correct return	0x00	Card type (2 byte)
12	Anti collide	send command	0x32	Request card parameter (1 byte) Request card parameter → = 0x93 no.1 = 0x95 no.2 = 0x97 no.3
		correct return	0x00	Card series No. (4 byte)
13	Select card	send command	0x33	Request card parameter (1 byte) + Card series No. Request card parameter → = 0x93 no.1 = 0x95 no.2 = 0x97 no.3
		correct return	0x00	SAK (1 byte)
14	Halt	send command	0x34	*Note: Halt the card*
		correct return	0x00	
15	Load Key	send command	0x35	Key (6 byte)
		correct return	0x00	-
16	Load Key From EE	send command	0x36	Key mode (1 byte) + key series No. (1 byte) Key mode → = 0x60 KeyA = 0x61 KeyB Key series No. → = 0~15
		correct return	0x00	-
17	Authentication	send command	0x37	Authentication mode (1 byte) + block No. (1 byte) + card series No. (4 byte) Authentication mode → = 0x60 KeyA = 0x61 KeyB Block No. → = 0~64 (S50) or 0~255 (S70)

		correct return	0x00	-
18	Read	send command	0x38	Block No. (1 byte) + block quantity (1 byte) No. → = 0~64 (S50) or 0~255 (S70) Block quantity → = 1~4
		correct return	0x00	Block data (16 byte * block quantity)
19	Write	send command	0x39	Block No. (1 byte) + block quantity (1 byte) + block data (16 byte * block quantity) No. → = 0~64 (S50) or 0~255 (S70) Block quantity → = 1~4
		correct return	0x00	-
20	Value	send command	0x3A	Value mode (1 byte) + Block No. (1 byte) + Value (4 byte) Value mode → = 0xC0 Decrease value (DecValue) = 0xC1 Increase value (IncValue) = 0xC2 Restore value (Restore) Block No. → = 0~64 (S50) or 0~255 (S70)
		correct return	0x00	-
21	Transfer	send command	0x3B	Block No. (1 byte) Block No. → = 0~64 (S50) or 0~255 (S70)
		correct return	0x00	-
22	Store Key To EE	send command	0x3C	Key mode (1 byte) + key series No. (1 byte) + key (6 byte) Key mode → = 0x60 KeyA = 0x61 KeyB Key series No. → = 0~15
		correct return	0x00	-
23	Generic_ISO14443A	send command	0x30	CRC allow bit (1byte) + data (Reader to VICC)
		return correct	0x00	Card return data (VICC to Reader)
24	Generic_ISO14443B	send command	0x60	Data (Reader to VICC)
		return correct	0x00	Card return data (VICC to Reader)
25	Generic_ISO15693	send command	0x70	Data (Reader to VICC)
		return correct	0x00	Card return data (VICC to Reader)
26	ISO15693_Inventory	send command	0x71	<Flags> (1 byte) <AFI> (1 byte) <Mask length> (1byte) <UID> (8 byte)
		return correct	0x00	Card return data (VICC to Reader)

5.3 Status code returned.

Code	Description
0x00	normal
0x01	error → No card
0x02	error → Anticoll error
0x03	error → Bit counter error
0x04	error → Return data error
0x05	error → Authentication error

0x0d	error → Value operation error
0x0e	error → Card operation error
0x0f	error → Card operation overtime
0x10	error → Command or parameter error
0x11	error → Other errors