

RDM530 SERIAL Desktop Reader: ISO14443A/B, ISO15693 DEVELOPMENT KIT

FCC NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

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.

1 PS2 or RS232 or USB or TCP/IP OPERATIONS

The RDM530 Desktop Reader which support ISO14443-A-B, ISO15693, can operate with a terminal such as computer or other controller, which can supply PS2 orRS232 or USB or TCP/IP interface and only supplied by computer or other controller.

1.1 Electrical Interface

Basically, this communication protocol does not need to be bound with any electrical interface characteristic. Typically the following types of physical link could be used:

- PS2 (Point to point only)
- RS232 (Point to point only)
- USB (Slave only)
- TCP/IP(Slave only)

1.2 RS232 Data Format:

1.2.1 PC/SC Smart Card Reader with RS232 connection .Compliant with PC/SC V2.0 specifications.

1.2.2 RDM TAG MASTER DATA FORMAT: The data format (Start Bit, Data Bits, parity, Stop Bit) is software configurable, and can be set to match the special requirement of data transmission between two communication devices. The general data format is defined as:

Parameter	Description	
Baud Rate	Selective: 9600, 19200, 38400, 57600, 1152000	
	(It can be changed by command Send from the Host)	
Data Bits	Fixed: 8 bits	
Start Bit	Fixed: 1 Bits	
Stop Bit	Selective: 1 bit.	
Parity	None	

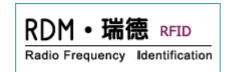


The following is the default setting (RS232):

Baud Rate	Data Bits	Start Bit	Stop Bit	Parity
9600	8	1	1	None

1.3 USB Data Format:

PC/SC Smart Card Reader with USB connection .Compliant with PC/SC V2.0 specifications.



2 Link Layer

The communication protocol is a packet-oriented protocol - all the data exchanged between two communication devices will be based on packet format. The protocol is designed for multi-drop mode and where point-to-point mode could be treated as a special case of multi-drop mode.

The data packet starts with the control character 'STX' and ends with 'ETX', which follows the 8-bit BCC checksum. Besides the checksum is used for error checking, character (byte) time-out and packet (command) time-out are used to re-synchronous the communication.

2.1 Packet Format

There are two types of data packets. Command Message is the packet Send from the Host to the reader device. The Reply Message is the packet Send from the reader to the Host.

Packet format for Command Message (Host to Reader)

Packet format for Reply Message (Reader to Host)

STX	STATION ID	DATA LENGTH	STATUS	DATA[0N]	всс	ETX



3 Available Commands

Name	Description		
SYSTEM COMMANDS			
SetAddress	Program the Device Address to the reader		
SetBaudrate	Set the reader's communication baud rate		
SetSerlNum	Set the reader's Serial Number		
GetSerNum	Get the reader's Serial Number		
SetUserInfo	Set the Usr Information		
GetUserInfo	Get the User Information		
GetVerNum	Get the reader's firmware version number.		
SetPort	Control status of the I/O ports.		
SetLED	Turn On/Off the LEDs		
SetBuzzer	Turn On/Off the Buzzer		
Control-workmode	Control the reader to stay in active state or idle state		
	ISO14443-A-B COMMANDS		
REQA	ISO14443A REQUEST		
Anticoll	ISO14443A Anti-collision		
Select	ISO14443A Select		
Halt	ISO14443A Halt		
Request_B	ISO14443B REQB command		
Attrib_B	ISO14443B ATTRIB command		
RDM_Rst_ Typeb	Integrate the request and attrib command		
RDMTypeb_Trans fer_Command	s ISO14443-4 transparent command Type B Card		
MF_Read	_Read The Read command integrates the low level commands (request, anticollision, select, authentication, read) to achieve the reading operation with a one-step single command.		
MF_Write	The Write command integrates the low level commands (request, anti- collision, select, authentication, write) to achieve the writing operation		



	with a one-s	step single command.		
MF_InitVal	The Initialization command integrates the low level commands (request anti-collision, select, authentication) to achieve the value block initialization with a one-step single command.			
MF_Decrement	The Decrement command integrates the low level commands (request, anti-collision, select, authentication) to achieve the Decrement with a one-step single command.			
MF_HLIncrement	The Increment command integrates the low level commands (request, anti-collision, select, authentication) to achieve the Increment with a one-step single command.			
MF_GetSnr	The GetSnr command integrates the low level commands (request,anticoll,select) to achieve the select card with a one-step single command,and output the card's Snr			
	1	ISO15693 COMMANDS		
RDM_Inventory		ISO15693 Inventory Command		
RDM_Read		ISO15693 Read Command		
RDM_Write		ISO15693 Write Command		
RDM_Lockblock		ISO15693 Lock_Block Command		
RDM_StayQuiet		ISO15693 Stay_Quiet Command		
RDM_Select		ISO15693_Select Command		
RDM_Resetready		ISO15693_Reset_To_Ready Command		
RDM_Write_Afi		ISO15693_Write_AFI Command		
RDM_Lock_Afi		ISO15693_Lock_AFI Command		
RDM_Write_Dsfid		ISO15693_Write_DSFID Command		
RDM_Lock_Dsfid		ISO15693_Lock_DSFID Command		
RDM_Get_Information		ISO15693_Get_System_Information Command		
RDM_Get_Multiple_Block_Security		ISO15693_Get_Multiple_Block_Security Command		

中国 • 深圳市南山区高新区科技南十二路方大大厦 201 室 TEL: +86-755- 61313350

Fangda Building201,Keji 12th Rood south, High-Tech Industrial Park, Nanshan Shenzhen, China

Http://www.datarfid.com E-mail: support@datarfid.com FAX: +86-755- 61313357



RDM_15693_Transfer_Command

Using this command may transparent ISO15693 command to The Card that it meet the ISO15693 protocol

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

3.1 Sequence Example

3.1.1 SetBaudrate (0x81)

Data Field

DATA[0] Communication speed

0x00 - 9600 bps 0x01 - 19200 bps 0x02 - 38400 bps 0x03 - 57600 bps 0x04 - 115200 bps

Response:

STATUS: 0x00 - OK

Data Field

DATA[0] Return the new communication speed Code.

0x00 - 9600 bps 0x01 - 19200 bps 0x02 - 38400 bps 0x03 - 57600 bps 0x04 - 115200 bps

Description

Set the reader's baud rate for host communication. The baud rate will be stored in the reader's EEPROM and used as the new default baud rate. The new baud rate will not take effect until the reader is reset.

EXAMPLE:

Send Data: AA 02 02 81 01 80 BB

Response Data: : AA 02 02 00 01 01 BB (19200,N,8,1)

Example: Read from Block 10 reading 3 blocks, and output in ASCII

3.1.2 RDM_SET_PS2 (0x8F)

Send data:

DATA [0]: Mode Control

Bit0 : Request Mode. 0=Request Idle, 1 = Request All

Bit1 : Key Select. Select use KeyA or Key B for Authenticaiton

中国 • 深圳市南山区高新区科技南十二路方大大厦 201 室 TEL: +86-755- 61313350

Fangda Building201,Keji 12th Rood south, High-Tech Industrial Park, Nanshan Shenzhen, China

Http://www.datarfid.com E-mail: support@datarfid.com FAX: +86-755-61313357



0=KeyA, 1=KeyB

Bit2 : Output format 0=Hex, 1=ASCII
Bit3 : Read Mode, 0 = Block, 1 = Byte

Bit4 : CR\LF Mode, 0 = ON, 1 = OFF (if on the send a newline when the data

has been read, if off then just send the data and no newline)

Example: Read from Block 10 reading 3 blocks, and output in ASCII

SET:

Send Data : AA 00 0A 8F 05 03 10 ff ff ff ff ff ff 93 BB ($CR\LF = 0$)

Response Data: AA 00 02 00 80 82 BB

READ DATA:

WHEN CONNECT TO PS2 CONNECTOR GET DATA:

!"#\$%&'()*+,-./0123456789:;<=>?abcdefghijklmno

3.1.3 CMD_MF_Request (0x25)

Data Field

DATA[0]: Request mode

0x00 – Request Idle 0x01 – Request All

DATA[1]: 00 don't need to execute the halt command

01 need to execute the halt command

Response:

Data Field

STATUS: 0x00 - OK

DATA[0-3]: Card Serial Number

Description:

The High Level Value Increment Command integrates the low level commands (Request, AntiColl1, Select) and get the SNR of selected card.

EXAMPLE:

Send Data: aa 02 03 25 26 00 02 bb

Response Data: AA 02 06 00 00 16 0F F4 7F 96 BB

中国 • 深圳市南山区高新区科技南十二路方大大厦 201 室 TEL: +86-755- 61313350



3.2 ISO15693 Commands Example

3.2.1 RDM_Inventory (0x10)

Data Field

DATA[0]: Flags

Bit0: Sub_carrier_flag Bit1: Date_rate_flag Bit2: Inventory_flag

Bit3: Protocol Extension_flag

Bit4: Afi_flag Bit5: nb_slots_flag Bit6: Option_flag Bit7: RFU

. ..

DATA[1]: Afi

DATA[2]: Masklengh

DATA[3..10]: Maskvalue

Response:

STATUS: 0x00 - OK

Data[0]: The card's number that exist in the reading area

Data[1..n]: UID

Description:

Run the anticollison loop. through this command you can get the UID of all the VICC in the readable zone.(usually it may get 3 to 6 card's snr,it base on the strength of the RF power)

Example:

Send Data: aa 00 04 10 06 00 00 12 bb

When only one card in the reading area: AA 00 0B 00 01 00 01 4A 80 E9 11 00 00 07 3E BB

Two card in the reading area: AA 00 15 00 02 00 01 4A 80 E9 11 00 00 07 E0 00 00

3B 80 E9 11 00 00 07 87 BB

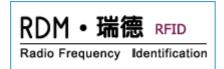
Three card in the reading area: AA 00 1F 00 03 00 01 4A 80 E9 11 00 00 07 E0 00 00

3B 80 E9 11 00 00 07 E0 00 00 3F 80 E9 11 00 00 07 2C BB

Four card: AA 00 29 00 04 00 01 4A 80 E9 11 00 00 07 E0 00 00

3B 80 E9 11 00 00 07 E0 00 00 3E 80 E9 11 00 00 07 E0 00 00 3F 80 E9 11 00 00 07 BC BB

Have no card in the reading area: AA 00 02 01 83 80 BB



4 RDM530 Type Description

RDM530 X---- X

Contactless Interface option

A: ISO14443-TYPEA

B: ISO14443-TYPEA+B

C: ISO15693

D: ISO14443-TYPEA+TYPEB

E: ISO14443-TYPEA+TYPEB+IS015693

F: ISO11784/ISO11785

Communication Interface Option

T = TCP/IP

S = RS232

P = PS2

U = USB

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TEL: +86-755-61313350