

RDM880 SERIAL MODULE: OEM & ODM ISO14443A/B, ISO15693, ISO11784/11785 MODULE DEVELOPMENT KIT

1 RS232 or SPI OPERATIONS

The OEM & ODM ISO14443-A-B, ISO15693, ISO11784 /11785 MODULE can operate with a terminal such as computer or other controller, which can supply RS232 or SPI interface.

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:

- RS232 (Point to point only)
- CMOS-Logic Level (Point to point only)
- SPI (Slave only)

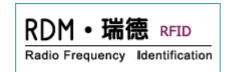
1.2 Data Format

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 |



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)

| STX | STATION ID | DATA LENGTH | CMD | DATA[0N] | всс | ETX |
|-----|------------|-------------|-----|----------|-----|-----|
|-----|------------|-------------|-----|----------|-----|-----|

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 | ISO14443-4 transparent command Type B Card | | | | |
| MF_Read | The Read command integrates the low level commands (request, anti- collision, 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. | | |
|---------------------------------|--|--|--|--|
| ME In 1975 | | | | |
| 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 | | | |
| 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 | | |

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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)

3.1.2 **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

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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

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

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RDM TAG MASTER CO.,LTD garea: AA 00 0B 00 01 00 01 4A 80 E9 11 00 00 07 3E BB

When only one card in the reading area:

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

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

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

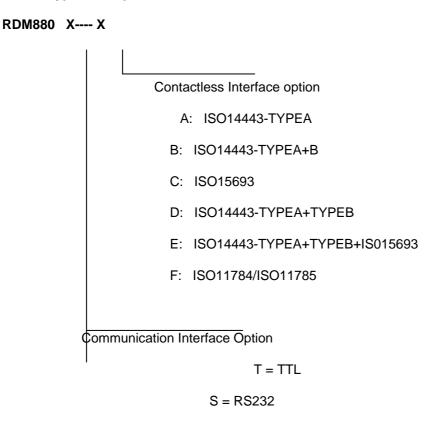
AA 00 29 00 04 00 01 4A 80 E9 11 00 00 07 E0 00 00 Four card:

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

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



4 RDM880 Type Description



P = SPI

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.

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