## GENERAL DESCRIPTION

RHOMBUSMF501 transceiver unit is designed for reading  the Serial Number of the Mifare I compatible IC cards and is a major component in RFID(Radio  Frequency Identification) reader system. It supports a 3x4 keypad to facilitate auxiliary password input. It can be applied in office/home security, personal identification, access control and production control systems etc.

## FEATURES

- Built-in transceiver antenna;
- Maximum effective distance up to 75mm;
- Less than 200ms decoding time;
- Low power dissipation with single power supply;
- Wiegand 26bits or other format interface optional;
- Support Mifare I compatible IC cards;
- Support 3x4 keypad for password input;
- Built-in bi-color LED and buzzer.

## INTERFACE DESCRIPTION

| NUMBER | COLOR | SYMBOL | DESCRIPTION |
|---|---|---|---|
| 1 | Red | VCC | Positive Power Supply |
| 2 | Black | GND | GND |
| 3 | Green | WD0 | Output as DATA0 in Wiegand |
| 4 | White | WD1 | Output as DATA1 in Wiegand |
| 5 | Brown | HOLD | Output as HOLD in Wiegand |
| 6 | Blue | LED | Input, internally pulled up to +5V. Connected to |
| 7 | Grey | BUZ | Input, internally pulled up to +5V. Connected to |
| 8 | Yellow | BELL1 | Doorbell switch |
| 9 | Orange | BELL2 | Doorbell switch |

## CHARACTERISTICS

- Absolute Maximum Ratings

| ITEM | SYMBOL | VALUE | UNIT |
|---|---|---|---|
| Power Supply | VCC | 15 | V |
| Operating Temp. | TOPR | 0~+70 | ℃ |
| Storage Temp. | TSTR | -55~+125 | ℃ |

- Electrical and Mechanical Specification

Under $T_A$＝25℃，VCC＝+12V unless specified

| ITEM | SYMBOL | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|
| Power Supply | VCC | 10 | | 15 | V |
| Current Supply | IC | | 70 | 100 | A |
| Operation Freq. | $F_{REQ}$ | | 13.56 | | MHZ |
| Effective Distance* | DIS | 0 | 50 | 75 | mm |
| Decoding Time | $T_{DEC}$ | | 120 | 200 | ms |

- Effective Distance depends on tags and operating environment.

## APPLICATION INFORMATION

1.    Wiegand 26bits Format Interface

   Wiegand 26bits Format Interface comprises of 26bits data including 24 user bits and 2 parity check bits. The 24 user bits correspond to the latter serial number bits of Mifare I card.

| Bit | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|-----|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|  | PE | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | D | PO |
|  |  | E | E | E | E | E | E | E | E | E | E | E | E | O | O | O | O | O | O | O | O | O | O | O | O |  |

- PE as even parity check bit and PO as odd parity check bit;
- The bits marked with E go for even parity check and the bits marked with O go for odd parity check;

2.    Wiegand 26bits Format Timing
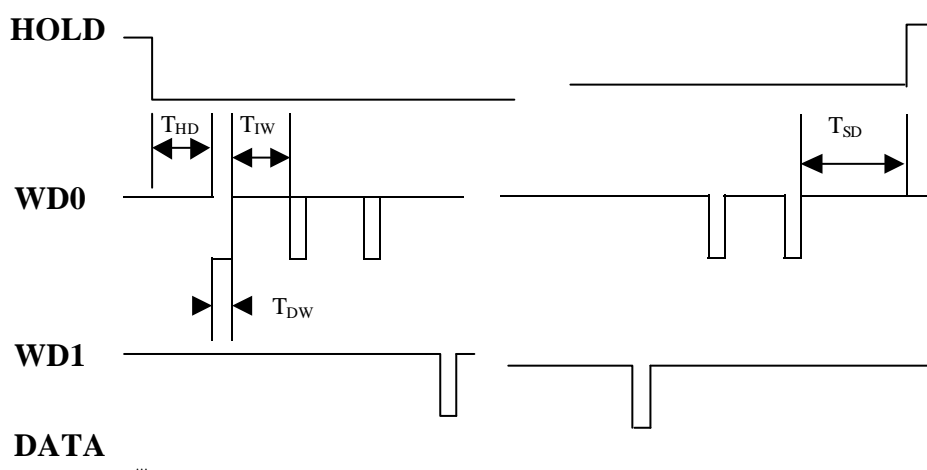


| SYMBOL | DESCRIPTION | VALUE( Typ. ) |
|--------|-------------|---------------|
| $T_{HD}$ | Sending Start Delay | 0.06ms |
| $T_{SD}$ | Sending Stop Delay | 2ms |
| $T_{DW}$ | Data pulse width | 0.4ms |
| $T_{IW}$ | Data pulse interval width | 2ms |

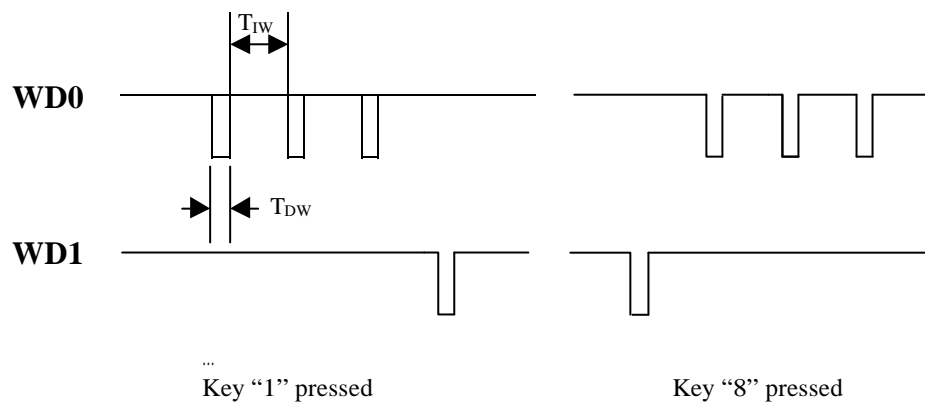3.    3x4 Keypad Interface
      RHOMBUSMF501 support a 3x4 keypad to facilitate auxiliary password   input. Every key is 4bit encoded as following(MSB first):
         0=0000   1=0001   2=0010   3=0011   4=0100   5=0101
         6=0110   7=0111   8=1000   9=1001   *=1010   #=1011
      RHOMBUSMF501 output the key code when a key pressed.

4.    Key Code Output Timing



Key "1" pressed                    Key "8" pressed

**Note:    Rhombus' products must work with linear regulated power supply, and other kinds of power supply are prohibited.**