

# 125K-R-TTL-M1

125K EM4100 Slim size RFID Reader Module

## 1. General Description

This is a low cost high performance, super mini size RFID reader module for EM4100 Manchester encoded and RF/64 read only transponders. Only one external inductive antenna is required for building a complete card reader. All complex antenna driver, RF receiver and decoding are handled by the module. Besides, it can be programmed for most widely adopted output format – Wiegand 26 bits or TTL level RS-232 ASCII by only one external resistor.

## 2. Features

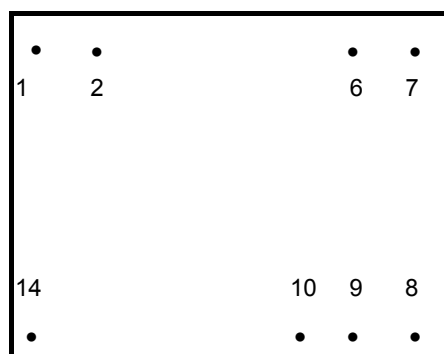
- High sensitivity, reliable performance
- Low cost
- Medium read range (Depend on the antenna used.)
- Ultra Compact, small outline, Standard DIP14
- Simple installation - Only one external antenna
- Externally programmable by one resistor.

## 3. Details Specifications

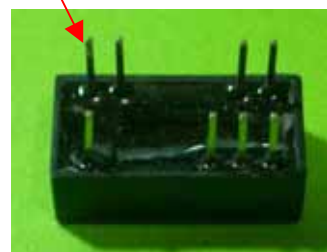
- Power supply : 5 Volts +/-0.15Volt DC, 80mA typical
- Output Interface: Wiegand 26bits, RS-232(TTL level)
- Typical Read Range : 5-8cm for ISO card size
- Typical antenna parameter : L=490uH, Q<40
- Working Frequency : 125KHz +/- 2.5%
- Transponder Type : Read Only, EM4100 Manchester , RF/64 or compatible
- Operating temperature : -0°C to + 85°C
- Module Dimension : 21 X 11 X 6 mm
- antenna size : (32x75x2)mm (can customer made for Qty order)

## 4. Pin Assignment

Bottom view.



Pin 1



Pin out	RS232(TTL level)	Wiegand 26bits
1	Externa antenna	External antenna
2	Externa antenna	Externa antenna
6	LED/Buzzer control	LED/Buzzer control
7	Ground	Ground
8	NC	Data output ,D0
9	NC	Data output ,D0
10	Data output ,Tx enable : need connect a external 10K resistor to GND.	Hold default : No need external resistor
14	Vcc (+5V)	Vcc (+5V)

## 5. Operating Mode Programming

Output format can be program by one 10K external resistor.  
The module will sample Pin 10 during power up to determine the operation mode.

### Wiegand output

The module built-in a pull up resistor , if no external pull down resistor connected .  
The default operation mode is wiegand 26 bit.

### TTL serial output

By connecting a resistor (10K) between Pin 10 to GND, the module will operate in RS232-TTL ASCII mode.

## 6. Data Structure

### 6-1. Data Structure (Serial ASCII)

Baud Rate: 9600, N, 8, 1

STX(02hex)	Data(10hex)	CR	LF	ETX(02 )
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The start character is factory defined as an 'STX' (02 HEX). This is followed by 10 Hex characters of data. The CR/LF characters serve to bring the received screen text back to the left hand side and on the line below after the data bytes have been sent. The 'ETX' (03 HEX) character denotes the end of the current transmission.

### 6-2. Data Structure (Wiegand Format-26 Bit)

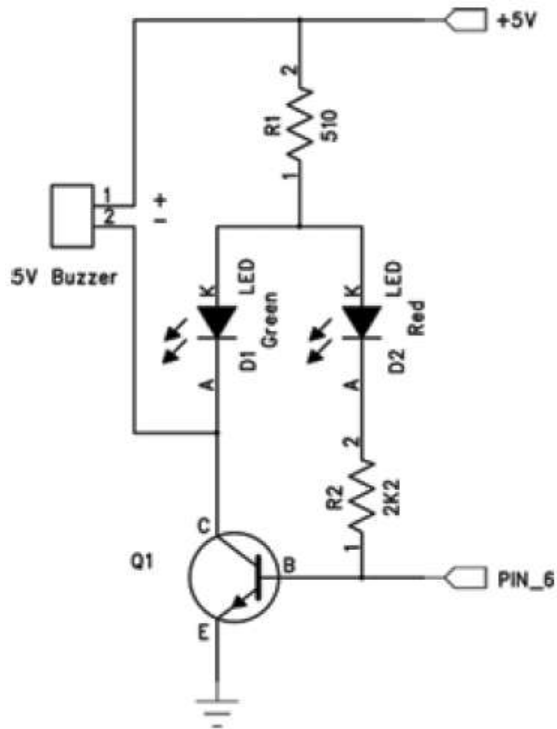
Wiegand 26bits Format Interface comprises of 26bits data including 24 user bits and 2 parity check bits. The 24 user bits correspond to the latter 40 user bits in tags

## 7. Recommendation

Install a 10uF 6.3V capacitor between the power supply (Vcc) pins of the module will improve the read range and stability

## 8. Application Circuit for LED/buzzer control

Suggested circuit for dual color LD and Buzzer



## 8. Trouble shooting

In case of problems the following procedure should be checked.

### Failure to read

- [1] Checked the module is not reversed insert.  
Pin reversed installation will damage the module
- [2] check the programming pin (Pin 10) is correctly connected  
(TTL output mode – need a external 10K resistor is connected with GND)
- [3] measure the supply voltage (Vcc) and confirm it is 5V .  
Vcc more than 5V will damage the module