

# RF310 RFID Reader Module

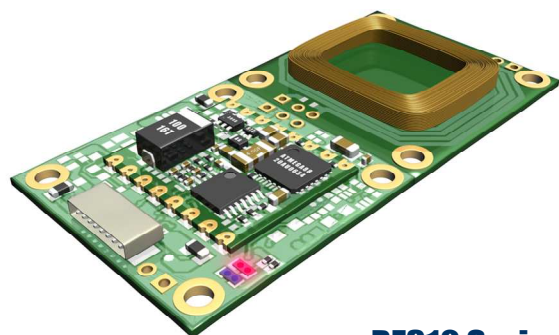
RF10 Series Extension Board

## INTRODUCTION

The RF310 series is an economical choice for high performance proximity reader module, featuring low power consumption, small dimensions and optimal reading range that has been designed specifically for OEM applications. The RF310 series offers a good reading.

Range at 5 volts which makes it a perfect choice for access control implementation and other various applications.

This unit supports different communication interfaces, including USB HID, RS232, Serial TTL, Wiegand and ABA TK2 that makes it easy to implement and upgrade with existing installation.



RF310 Series

## FEATURES

- EM Card 125 kHz read only.
- Output interface includes USB HID Keyboard, RS232, Serial TTL, MSR ABA TK2 and Wiegand.
- Wide operation voltage range (3.3V~ 5V).
- Reading distance: 4~6 cm.
- Support In-System Programming and Self Firmware Update.

## SPECIFICATIONS

### OPERATING

Transmit Frequency	125 kHz standard.
Transponder	H4001 / H4002 / EM4100/4102 EM Card Read only
Reading Distance	Up to 5 cm with EM card.
Interface	Wiegand, MSR ABA Track2 or RS232

### ELECTRICAL

Power Input	3.3 to 5 VDC. Linear supply recommended.
Current Requirement	50mA @5VDC.

### MECHANICAL

Dimensions	Length: 60 mm / Width: 30 mm / Height: 8 mm for RF320R/L/HK-00/01 Series. Length: 30 mm / Width: 30 mm / Height: 14.5 mm for RF320R/L/HK-10 Series.
Weight	10 gm.

### ENVIRONMENTAL

Temperature	Operation : 0 °C to 55 °C. Storage : -10 °C to 65 °C.
Humidity	Operation : 10 % to 90 % noncondensing. Storage : Up to 100% noncondensing.

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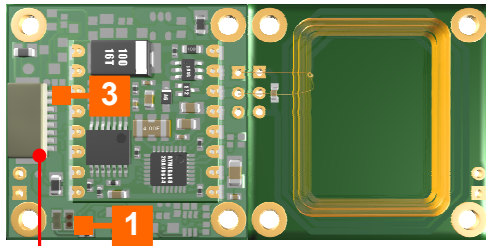
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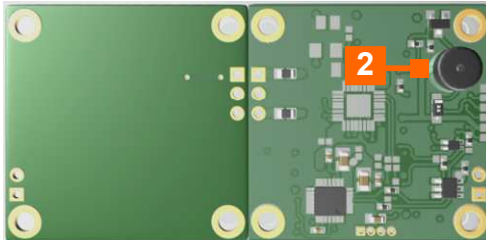
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## ■ TERMINAL / INDICATOR DESCRIPTIONS



PIN1



### 1 LED Indicator

Blue	Red	Description
Off	On	Standby
On	On	Read OK
Off	On	ISP Mode

### 2 Sound Indicator

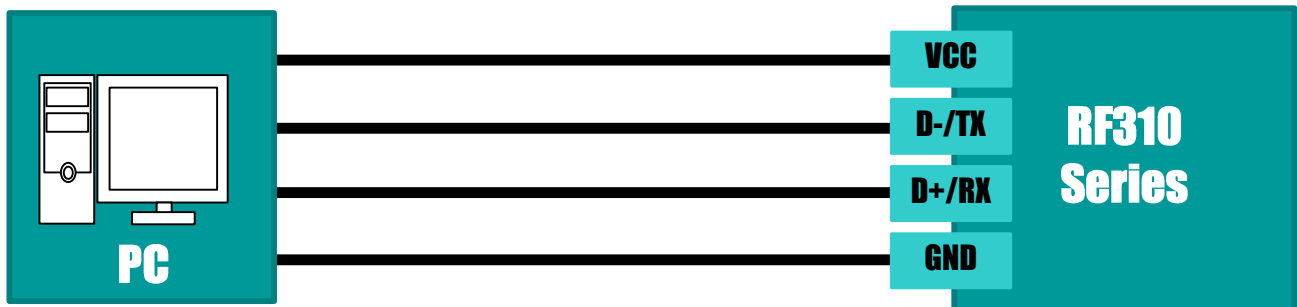
Buzzer	Description
Bi-	Read OK
Other	Software Control

### 3 8 Pin Terminal

Pin	Signal	In/Out	Description
1	VCC	P	Power 3.3-5 Volts
2	D- / TX	I/O	USB HID Differential Pair & RS232 Transmission.
3	D+ / RX	I/O	USB HID Differential Pair & RS232 Reception.
4	GND	P	Ground for Power Return
5	SD	-	Shield
6	DATA / W0	I/O	Magstripe Data & Wiegand Data 0
7	CLK / W1	I/O	Magstripe Clock & Wiegand Data 1
8	CP	I/O	Card Present Output

## ■ CONNECTION

### RF310 Wiring Diagram



Item Pin#	RF310HK-00 (USB HID)	RF310R-00 (RS232)	RF310L-00 (Serial TTL)	RF310M-00 (ABA TK2)	RF310W-00 (Wiegand)
1	DC +5V	DC +5V	DC +5V	DC +5V	DC +5V
2	D-	TXD	TXD	TXD	TXD
3	D+	RXD	RXD	RXD	RXD
4	GND	GND	GND	GND	GND
5	Shield	Shield	Shield	Shield	Shield
6	-	-	-	Data	Wiegand0
7	-	-	-	Clock	Wiegand1
8	-	-	-	CP	-

# OUTPUT FORMAT

## Data Structure (Serial ASCII)

Baud Rate : 19200,N,8,1

STX(02 HEX)	DATA( 10 HEX CHARACTERS )	CR	LF	ETX(03 HEX)
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The start character is factory defined as a 'STX' (02 HEX). This is followed by 10 Hex characters of data. The CRLF 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.

## Data Structure (Magstripe Emulation , ABA Track 2)

Speed : Simulated to 40 IPS (Inch per Second)

10 LEADING ZEROS	SS	DATA (14 DIGITS)	ES	LRC	10 TRAILING ZEROS
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The 10 leading zeros prepare the receiving unit to accept the data. The data is 14 digits long. SS is the Start Sentinel consisting of 1101. ES is the End Sentinel consisting of 1111. LRC is the Longitudinal Redundancy Check character. Lastly there are 10 trailing zeros. Magstripe 8 digits and 6 digits are available for special request.

The hexadecimal data from the card is first converted to a denary string before transmission. For example, a card containing the hexadecimal data (12345678AB) will be converted to denary and sent as denary 00078187493547 (14 digits).

The calculation is performed as follows.

$$1*16^9 + 2*16^8 + 3*16^7 + 4*16^6 + 5*16^5 + 6*16^4 + 7*16^3 + 8*16^2 + 10*16^1 + 11*16^0 = 78187493547 \text{ (Note: A=10; B=11)}$$

## Data Structure (Wiegand Format-26 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
P	S	S	S	S	S	S	S	S	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P
P	E	E	E	E	E	E	E	E	E	E	E	E													
													O	O	O	O	O	O	O	O	O	O	O	O	P
SUMMED FOR EVEN PARITY (E)													SUMMED FOR ODD PARITY (O)												

Note :

P : Parity (Even or Odd) Start Bit and Stop Bit

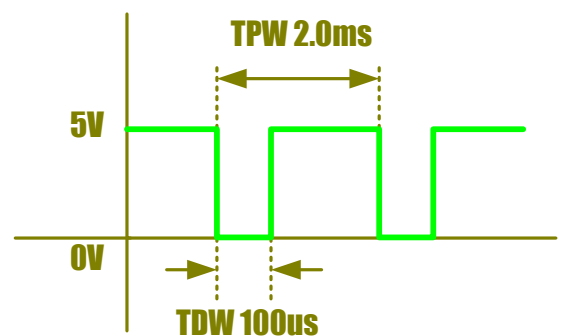
S : Site Bits from Card or Reader

C : Card Data

Wiegand Data Timing Specification

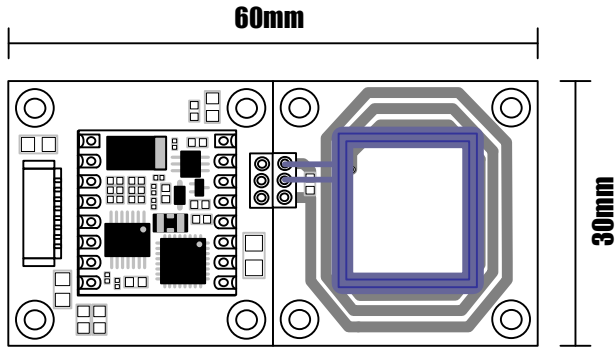
Pulse Interval (TPW) =2.0mS +/- 5%

Pulse Width (TDW) =100uS +/- 5%

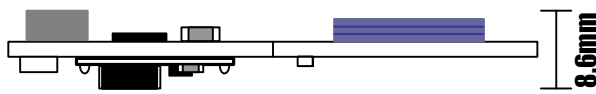


**EXTERNAL DIMENSION**

**RF310R/L/HK-00/01 Series**

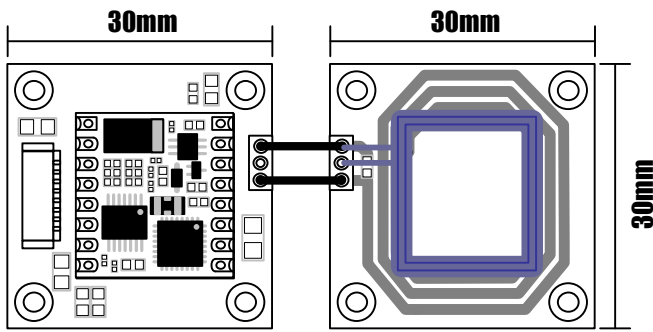


Top View



Left View

**RF310R/L/HK-30 Series**

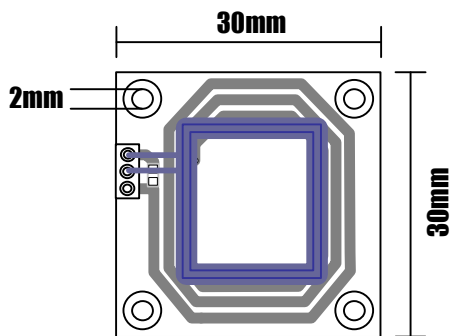


Top View



Left View

**RF310R/L/HK-10 Series**



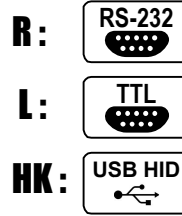
Top View



Left View

**ORDERING INFORMATION**

**RF310X-XX**



**00: Without Buzzer**  
**01: With Buzzer**  
**30: Antenna Separately**  
**10: Antenna Overlap**

**RF310 Series**



PART NO	BUZZER	INTERFACE	DIMENSION
RF310HK-00	X	USB HID	30*60*6.5mm
RF310L-00	X	TTL232	30*60*6.5mm
RF310R-00	X	RS232	30*60*6.5mm
RF310HK-01	0	USB HID	30*60*8.6mm
RF310L-01	0	TTL232	30*60*8.6mm
RF310R-01	0	RS232	30*60*8.6mm
RF310HK-30	0	USB HID	-
RF310L-30	0	TTL232	-
RF310R-30	0	RS232	-
RF310HK-10	0	USB HID	30*30*15.1mm
RF310L-10	0	TTL232	30*30*15.1mm
RF310R-10	0	RS232	30*30*15.1mm
RF310W-00	0	Wiegand	30*60*8.6mm
RF310M-00	0	TK2 ABA	30*60*8.6mm

RF310-30 is customized item. The distance between antenna board and PCB is according to customer's requirement. The value of capacitance matching needs to be adjusted by the sales.



**CAUTION:**

The crossed out wheeled bin label that can be found on your product indicates that this product should not be disposed of via the normal household waste stream.

To prevent possible harm to the environment or human health please separate this product from other waste streams to ensure that it can be recycled in an environmentally sound manner.

For more details on available collection facilities please contact your local government office or the retailer where you purchased this product.

This information only applies to customers in the European Union.

For other countries, please contact your local government to investigate the possibility of recycling your product.