



PIEM-HWS-LW

Micro Power 125KHz ASK EM Module (With internal antenna)

User manual

Ver.18.1

● Introduction

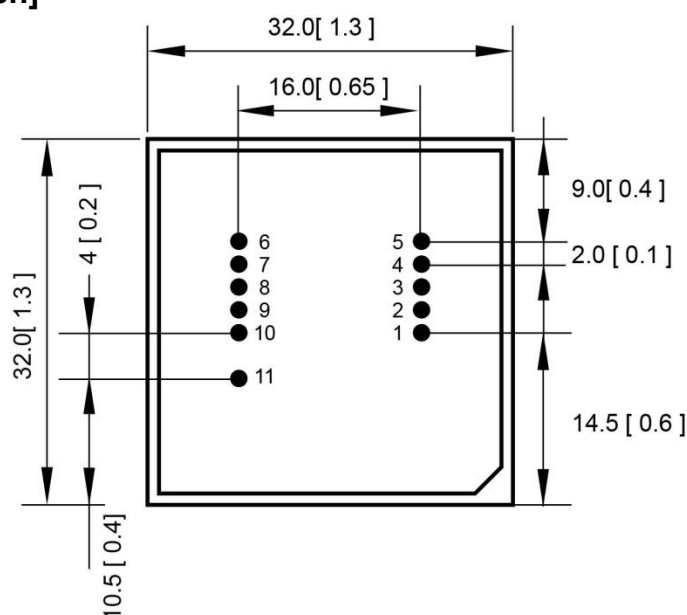
- PIEM-HWS-LW is ultra-low power consumption modules designed to operate from 3.3 volt to 10 volt. At its lower power setting is consumes just 18 μ A making these modules the perfect low power alternative to conventional readers. The modules support Wiegand 26/34 bits, ASCII data formats and able to read EM(EM4001, EM4100, EM 4102) or compatible cards and ideal for battery operated and portable applications.
- OEM/ODM orders are welcome.

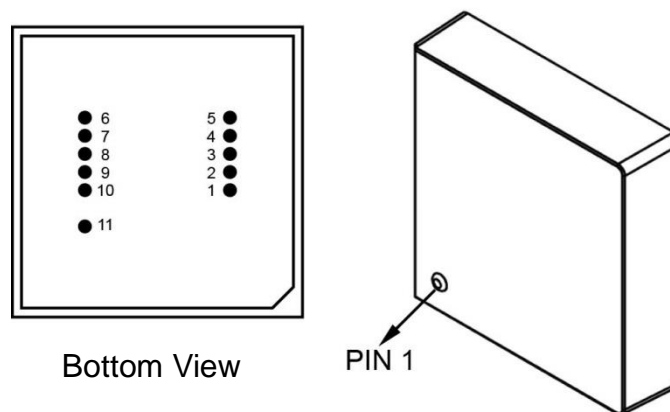


● Specification

RFID frequency	125KHz ASK	
Applicable cards	EM4001, EM4100, EM 4102, TEMIC 5557(ISO1785) or compatible	
Reading range	Card(T:1.8mm)	Max.3.5 cm
	Card(T:0.8mm)	Max.3.0 cm
	Tag	Max.2.0 cm
Output format	Wiegand 26/34 bits, ASCII	
Input voltage range	DC 3.3 V~DC 10 V	
Transmission spec.	9,600 bps N, 8, 1 / 19,200 bps N, 8, 1	
Standby current	11 μ A~18 μ A	
Working current when card present	12mA~17.2mA	
Dimensions(L) \times (W) \times (H)	32 x 32 x 8mm / 1.3 x 1.3 x 0.3inch	
Operating temperature	-10 $^{\circ}$ C ~75 $^{\circ}$ C	
Storage temperature	-20 $^{\circ}$ C ~85 $^{\circ}$ C	

● Dimension: Unit: mm[inch]





● Pin Description & Output Data Formats

Pin No.	Description	Wiegand26	Invert wiegand 26 data	Wiegand34	Invert wiegand 34 data	ASCII Decimal (ASCII CODE) 10 digits	UART 9,600bps	UART 19,200bps
Pin1	DC Voltage ground	GND	GND	GND	GND	GND	GND	GND
Pin2	G3	GND	N.C	GND	N.C	GND	---	---
Pin3	To External Antenna and Tuning Capacitor	N.C	N.C	N.C	N.C	N.C	N.C	N.C
Pin4	To External Antenna	N.C	N.C	N.C	N.C	N.C	N.C	N.C
Pin5	G2	GND	GND	N.C	N.C	---	N.C	GND
Pin6	Tag in Range	Tag in Range	Tag in Range	Tag in Range	Tag in Range	Tag in Range	---	---
Pin7	G5	GND	GND	GND	GND	N.C	N.C	N.C
Pin8	Data 1	Data 1	Data 1	Data 1	Data 1	---	---	---
Pin9	Data 0	Data 0	Data 0	Data 0	Data 0	TX(TTL)	TX(TTL)	TX(TTL)
Pin10	3.1KHz Logic(Beeper/LED)	Beeper/LED	Beeper/LED	Beeper/LED	Beeper/LED	Beeper/LED	Beeper/LED	Beeper/LED
Pin11	DC Voltage Supply	+3.3V~+10V	+3.3V~+10V	+3.3V~+10V	+3.3V~+10V	+3.3V~+10V	+3.3V~+10V	+3.3V~+10V

***Inver means signal (Voltage level) polarity inverted**

Pin Description:

Pin 1 is the system common ground for DC power supply and signal common.

Pin 2(G3), Pin 5(G2), and Pin 7(G5) are signal input for selecting various data output formats, such as Wiegand 26 / 34 bits, positive or negative going signal level UART ASCII decimal, RS-232 bps.(19,200 or 9,600)etc.

Pin 4 is reserved for external antenna installation to adapt for different antenna size or shape requirement if antenna self included in the module, then forget it.

Pin 6 is output signal level for “Tag in range”, when a tag or card is in the antenna reading range, the pin is set to VDD voltage, else, it is zero volt.(Ground level)

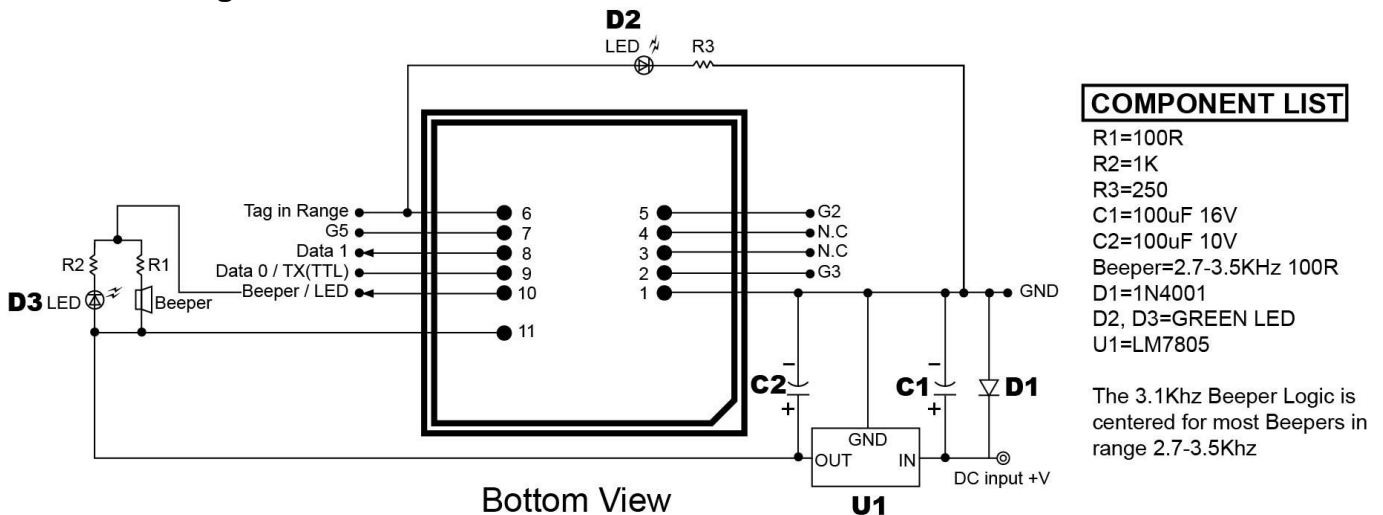
Pin 8 is the Wiegand Data 1 output, please refer **Figure 1&2.** for the wave timing as well as the positive or negative going pulse.

Pin 9 is the Wiegand Data 0 output as well as TTL or RS-232C signal depending on G2, G3, G5 selection.

Pin 10 is the beeper/LED output pin with 3.3KHz square output when effective tag is read and output. This pin is not buffered and cannot be used to drive a beeper directly.

Pin 11 is the DC supply voltage input. The voltage input range is +3.3V to+10V well filtered.

● Circuit Diagram



● Data Formats

● Wiegand 26 bits output format

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	26
P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P
EP	E	E	E	E	E	E	E	E	E	E	E	E													
													O	O	O	O	O	O	O	O	O	O	O	O	OP
Summed for even parity(E)													Summed for Odd parity(O)												

P=Start Even parity bit and stop Odd parity bit.

Even parity "EP" is generated by summing from bit2 to bit13 (Indicated by "E")

Odd parity "OP" is generated by summing from bit14 to bit25 (Indicated by "O")

● Wiegand 34 bits

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	26	27	28	29	30	31	32	33	34
P	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	P
EP	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E																	
																	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	OP
Summed for even parity(E)																	Summed for Odd parity(O)																

P=Start Even parity bit and stop Odd parity bit.

Even parity "EP" is generated by summing from bit2 to bit17 (Indicated by "E")

Odd parity "OP" is generated by summing from bit18 to bit33 (Indicated by "O")

Wiegand 26 protocol timing diagram (Card ID: 0005481135)

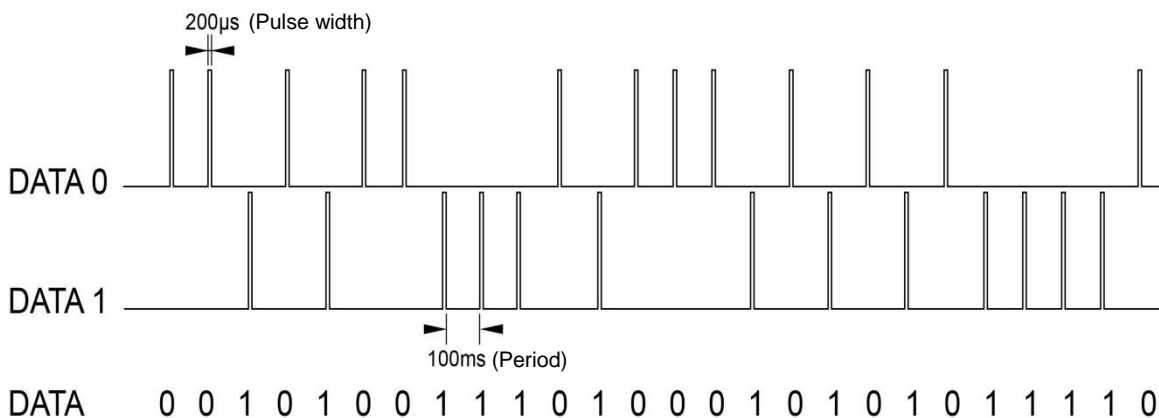


Figure 1

Invert Wiegand 26 protocol timing diagram (Card ID: 0005481135)

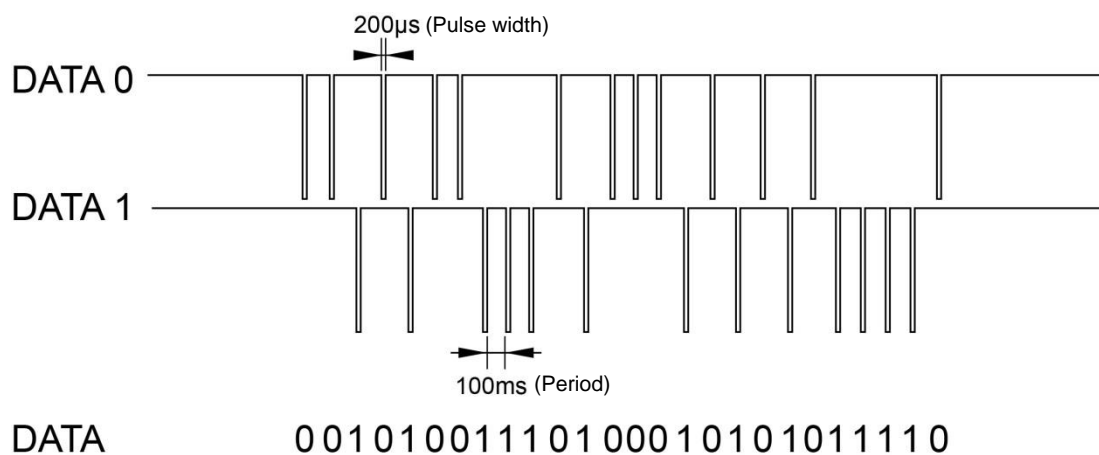


Figure 2

● UART output format

CARD ID(10 ASCII)

If the card no. is 0002274698, you will get the following ASCII.

HEX: 30H, 30H, 30H, 32H, 32H, 37H, 34H, 36H, 39H, 38H

Transmission Spec.

Baud rate : 9,600 bps
Parity bit : none
Data bit : 8
Stop bit : 1

● Ordering Information

PIEM-HWS-LW	: Micro Power 125KHz ASK EM Module, Wiegand 26 / 34 bits, ASCII, With antenna.
PXEM-HWS-LW	: Micro Power 125KHz ASK EM Module, Wiegand 26 / 34 bits, ASCII, Without antenna.