



RFID 125KHz EM read module

PIEM- AWAS-012A

Ver.20.1

● Introduction

The 125KHz proximity reading module equipped with the ASK decoding circuits to read the EM compatible contactless cards or tags into ABA, Wiegand & ASCII formats. In this version, we output the Wiegand 26 bits or ASCII or ABA signal by jumper selection. Additionally, we supported various module versions to answer different requirements, please refer to our products catalog.



● Features

1. 125KHz proximity reading for EM, TEMIC cards.
2. Embedded with internal antenna or external bigger antenna.
3. Wide input voltage range: +5.5~18V.
4. Epoxy potted for weather resistant with reliable quality.
5. Compact size with high performer.
6. Suitable for easy design block for tags or cards reading, such as access reader, fingerprint reader or industrial proximity application.

● Specification

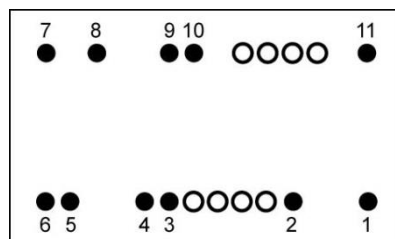
Dimensions	40.5(L) x 24(W) x 11(H) mm			
Net weight	17g ± 5%			
Enclosure material	ABS			
Card	EM 4001,EM 4102 or compatible / TEMIC 5557			
Operation frequency	125KHz			
Reading range	Proximity card	DC 5.5V	DC 12V	DC 18V
	(Thickness)0.8mm:	Max.8cm	Max.9cm	Max.7.5cm
	Proximity card	DC 5.5V	DC 12V	DC 18V
	(Thickness)1.8mm:	Max.9.5cm	Max.10cm	Max.9cm
	Specific card	DC 5.5V	DC 12V	DC 18V
	(Thickness)1.8mm:	Max.12cm	Max.13cm	Max.12cm
Output format	Wiegand 26 bits or ASCII(8 bytes) or ABA(14D)			
UART format	9,600 bps , 8, N, 1			
Power requirements	DC 5.5V~18V			
Standby current	DC 5.5V	DC 12V	DC 18V	
	11~42mA	11~44mA	11~40mA	
Operating current	DC 5.5V	DC 12V	DC 18V	
	33~42mA	34~43mA	35~44mA	
Operating temperature	-10℃ ~ 75℃			
Storage temperature	-10℃ ~ 85℃			

● Pin assignments

Pin No.	Description	Wiegand	ABA	ASCII
Pin 1	Zero Volts and Tuning Capacitor Ground	GND 0V	GND 0V	GND 0V
Pin 2	Power	DC 5.5V~18V	DC 5.5V~18V	DC 5.5V~18V
Pin 3	Format selector(+/-)	Connected to +5V	Connected to PIN8	Connected to GND
Pin 4	Card present output	No function	Card Present output	No function
Pin 5	Data 0	DATA 0	Data	CMOS
Pin 6	Data 1	DATA 1	Magstripe clock	TTL(to IC UART)
Pin 7	N.C.	N.C.	N.C.	N.C.
Pin 8	LED / Buzzer	Beeper/LED	Beeper/LED	Beeper/LED
Pin 9	N.C.	N.C.	N.C.	N.C.
Pin 10	Embedded Antenna and Tuning Capacitor Ground	Antenna	Antenna	Antenna
Pin 11	Embedded Antenna	Antenna	Antenna	Antenna

※ CMOS & TTL in ASCII output could support RS-485 interface.

● Bottom view



1	GND
2	Power DC 5.5V~18V
3	Format selector(+/-)
4	Card present
5	Data 0
6	Data 1 (RS-232)
7	N.C.
8	Beeper/LED
9	N.C.
10	Antenna
11	Antenna

● Data formats

●(10 Digits Card ID)UART (TTL) output format

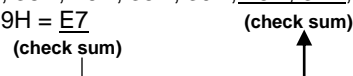
STX(02Hex)	CARD ID(10 ASCII)	CHECK SUM(2 ASCII)	CR	LF	ETX(03Hex)
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The 1 byte (2 ASCII characters) Check sum is the “Exclusive OR” of the 4 hex bytes(8 ASCII)Data characters.

If the card no. is 0033318F59, you will get the following ASCII with check sum.

STX
Hex with check sum : 02H, 30H, 30H, 33H, 33H, 33H, 31H, 38H, 46H, 35H, 39H, 45H, 37H, 0DH, 0AH, 03H ETX
Check sum algorithm : 00H ⊕ 00H ⊕ 31H ⊕ 8FH ⊕ 59H = E7 (check sum)

XOR=Exclusive OR



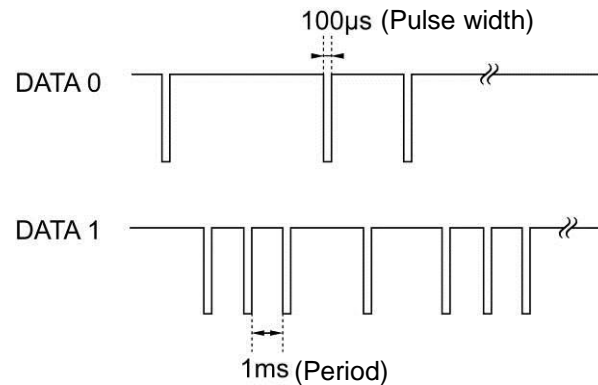
●Wiegand 26 bits

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
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")



Ex.: Card UID 3 bytes(Card No. in Hex.) : 22 B5 8A

Card No.	Wiegand 26 bits		Converted to 8 digits decimal	Display
	22 B58A	→	34 46474	03446474

●(14 Digits Card ID)Magnetic stripe ABA Track2 output format

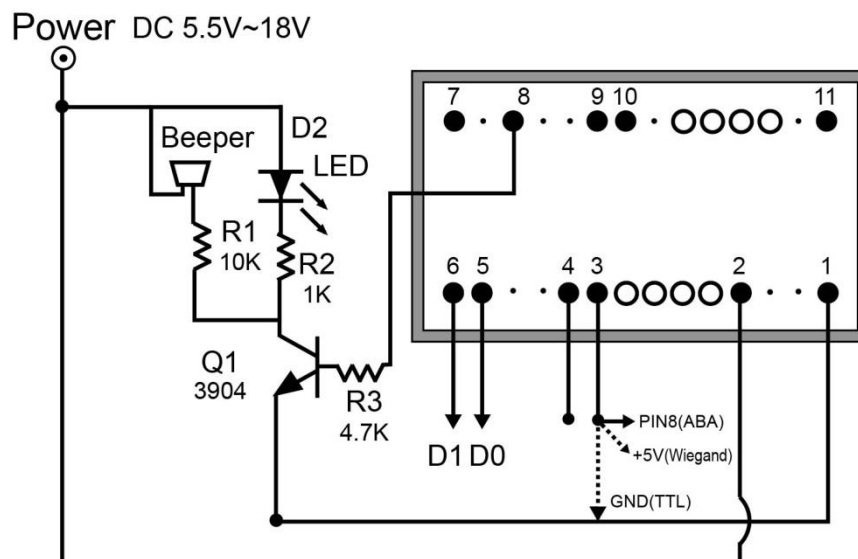
SS	CARD ID(14D)	ES	LRC
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SS is the start sentinel character of 11010

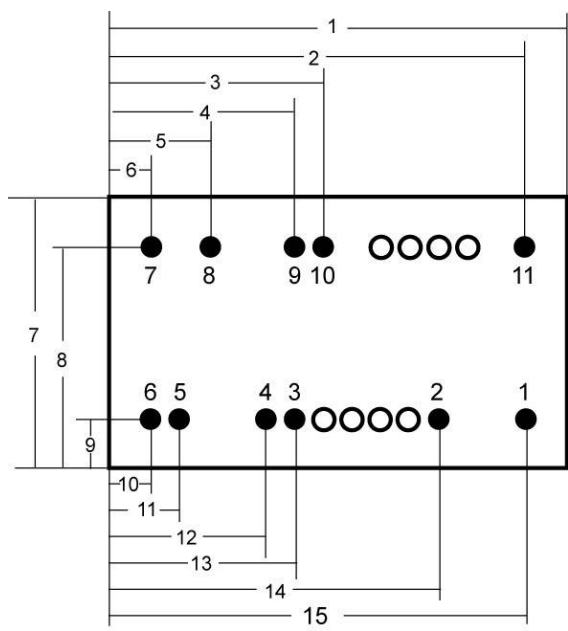
ES is the end character of 11111

LRC is the longitudinal redundancy check.

● Wiring example



● Dimensions(Unit: mm)

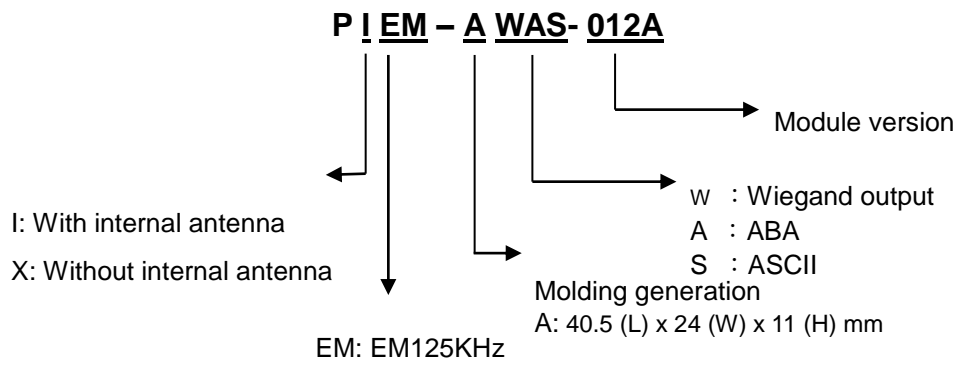


No.	Unit: mm
1	40.5
2	36
3	18
4	15.5
5	8
6	3
7	24
8	19
9	3.6
10	3
11	5.5
12	13
13	15.5
14	28.2
15	35.8

● Application fields



● Ordering information



Module version

Module version	Description
012A	ABA(14D) 、Wiegand 26 bits 、ASCII(5 bytes)

Specifications subject to change without notice for further modification.