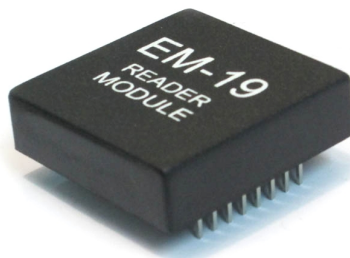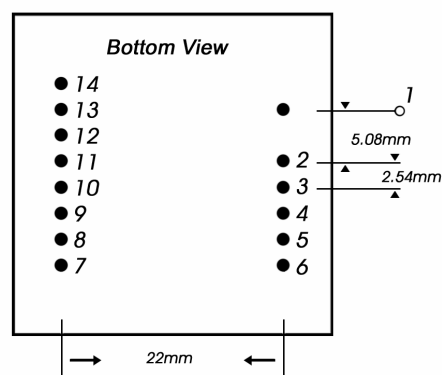# EM-19

Tech parameter:

- Voltage: 2.7 to 5 volts
- Current usage: < 25mA
- Operating Frequency: 125 KHz
- Read Distance: 8 to 12 cm
- Output: Wiegand26 and Serial (RS-232/TTL)
- Two Format Output Data
- Control Relays and Buzzer by Serial Port
- Possibility Use of Internal or External Antenna

Bottom View

Basal Specifications:

No.	Pin Name	Descriptions
1	VCC	2.7 to 5 volts
2	GND	GND
3	BEEP OUT	Beep and LED Output (1.9KHz Sound)
4	EX ANT	External Antenna Input
5	COM-ANT	External and Internal Coil Command
6	IN ANT	Internal Antenna Input
7	RS232/TTL	High is TTL-UART ,Low is RS232 Serial Port
8	SEL	High is EM-18 HEX Code ,Low is RF01D, ID-12 HEX Code
9	TXD	Serial Port Transmitter
10	D1	WEIGAND 26 DATA1
11	D0	WEIGAND 26 DATA0
12	RXD	Serial Port Receiver
13	CODE ONLY	Low is Shut-down Relay and Beeper (Control via Serial Commands)
14	RELAY	Relay Output (Positive)

Pin Description Table

Output format:

1. Wiegand26 (format):

Weigand protocol provides 2 lines for data transfer. A pulsed transition on the DATA1 line indicates a logic 1 bit, while a pulsed transition on the DATA0 line indicates a logic 0 bit. In their idle state both lines are held high. During data transfer the appropriate logic line will pulse low for 63uS followed by a period of 2ms where both lines are held high. In this fashion each bit is transmitted in sequence until all bits are sent.

The end of the transmission is signaled by both lines being held high for more than 50mS. Figure1 shows an example of the timing sequence for Weigand protocol.
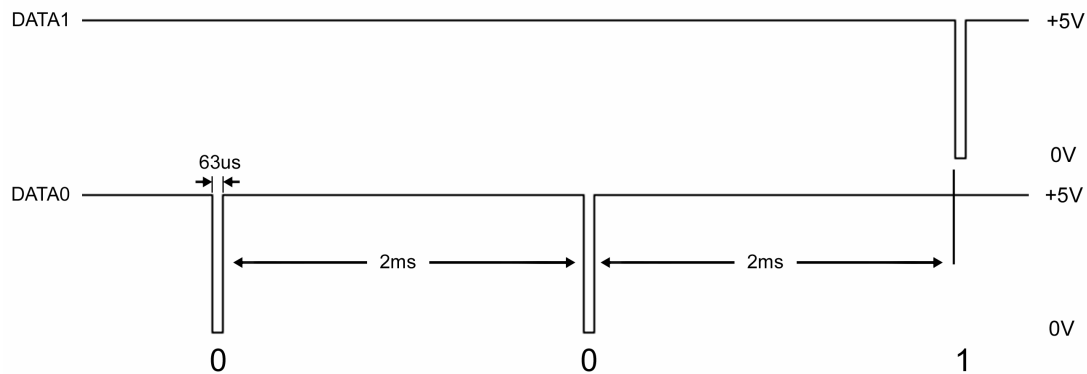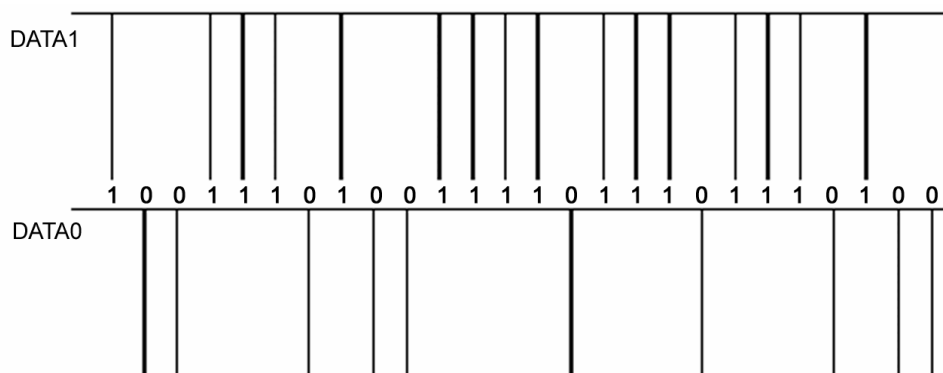

Figure 1: Weigand protocol waveform.

Wiegand 26 input format description:

Example WIEGAND26 Output Data for the Tag Number is: 0003832762

Weigand26 protocol is defined as a stream of 26 bits, consisting of 1 Even parity bit, 24 data bits, and 1 Odd parity bit.

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
Note		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	
	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
Sample	1	0	0	1	1	1	0	1	0	0	1	1	1	1	0	1	1	1	0	1	1	1	0	1	0	0

Note: P: parity Start and Stop Bits, E: Summed for Even parity (XOR 12bit from High Data) O: Summed for odd parity (XOR 12bit from Low Data)   D: Data code for card: the data will use the last 24 data bits of card.

For Example:

Card HEX code is: 5D003A7BBA Card unique code is: 0003832762; convert the last 24 data bits of card code to Decimal: 3A7BBA >>Dec>> 0003832762 (Code printed on the Tags).

2. RS-232 interface format:

Serial Port Description:

1. Data baud rate: 9600 bps   2.data bit: 8-bits   3.Parity check: none   4.stop bit : 1

- If the pin-7 (TTL) No changes The Device UART working in the TTL Serial interface Mode for usage Micro-controllers Or IC-Max232.

- If the pin-7 (TTL) is connect to ground voltage The Device UART working in The RS232 Serial Mode for direct connection to a PC COM Port.

- If pin-8 (SEL) No change Output Data format is 10 ASCII DATA (card HEX no.) + 2 ASCII DATA (XOR result). For example: Card code is '5D003A7BBA', XOR code is 'A6'. Output code: '5D003A7BBAA6' without enter code (CR+LF).

	HEX Number Card									XOR	
ASCII	5	D	0	0	3	A	7	B	B	A	A	6
HEX	35	44	30	30	33	41	37	42	42	41	41	36

- If pin-8 (SEL) is connect to ground voltage the device Output Data format is: 1 ASCII start Text char (02) + 10 ASCII DATA (card HEX no.) + 2 ASCII Enter CRLF code (chr13, chr10) + 1 ASCII stop text code. Card code is 5D003A7BBA. Output code: '⌐5D003A7BBA⌐' With Enter CR+LF.

	START	HEX Number Card										Enter		STOP
ASCII	⌐	5	D	0	0	3	A	7	B	V	A	CR	LF	∟
HEX	02	35	44	30	30	33	41	37	42	42	41	13	10	03

Decimal Unique Code (printed on the Tags)**:**
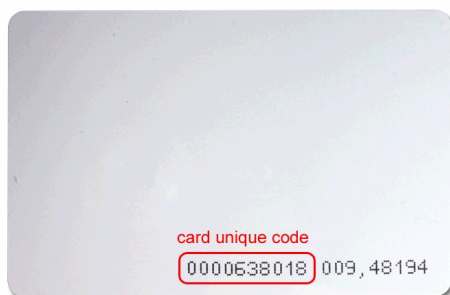
For the 10-digit Decimal Unique Code printed on the Card or Tags, Convert 3-Byte (The last 6 ASCII code) to Decimal (10-Digit Format).

For Example the Card HEX Code is '1E0009BC42' Convert HEX (09BC42) To Decimal: 0000638018 (Code printed on the Card).

3. Serial port Commands:

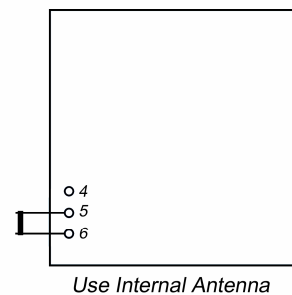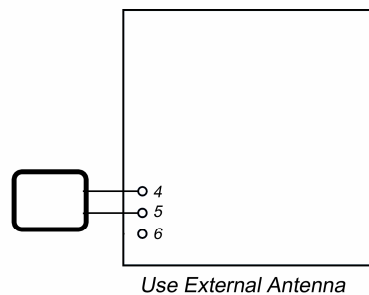Ability to receive Five commands from the serial port (via RXD pin 12)

For Use the serial commands send 1-byte ASCII code '1' to '5' via RXD pin in the module.

Data baud rate = 9600 bps, Data bit = 8-bits, Parity check = none, stop bit=1

No.	Command	Command Name	Performance
1	1	BEEP	Beep Once For 200ms
2	2	BEEP_LONG	Beep Once For 1500ms
3	3	RELAY_ON_OFF	Open Relay For 800ms
4	4	RELAY_ON	Turn Relay permanently
5	5	RELAY_OFF	Shutdown Relay

4. Internal OR External Antenna:

- If pin5 is connect to pin 6 with a jumper, (you can use the Internal Antenna).Or you connect pin5 to the pin4 through a External Antenna; you can use an External Antenna.

Use External Antenna   *Use Internal Antenna*

5. Application Circuit:

VCC

VCC=2.7V To 5V

1000u/16V

100n

EM-19

Code Only

RXD
D0
D1
TXD

VCC

470

TTL/RS232

SEL

VCC

RELAY

1N4148

1K

NPN

470