

EM12 Reader Module

Introduction

The EM12 is a low cost high performance proximity reader module featuring long range and small dimensions that has been designed specifically for OEM applications. The EM12 features good read range at voltages as low as 5 volts making it ideally suited to a wide variety of applications, particularly access control. The same basic unit can be configured to output most of the common formats, including ASCII, Wiegand26 and Magnetic ABA Track2 data format making it easy to upgrade existing installations.

The reader generates a 125KHz inductive field that extends some way beyond the reader module. When a transponder is placed within the vicinity of the reader module it draws power from this field and providing the field is of sufficient strength the internal microcircuits contained in the transponder begin to function. Data is transferred from the transponder by means of amplitude modulation in such a manner that the transponder varies the rate at which it draws power from the field in a way that corresponds to the internal identity code programmed in this internal memory. These changes in field power can be detected by the reader and converted back into a copy of the original data.

Specifications

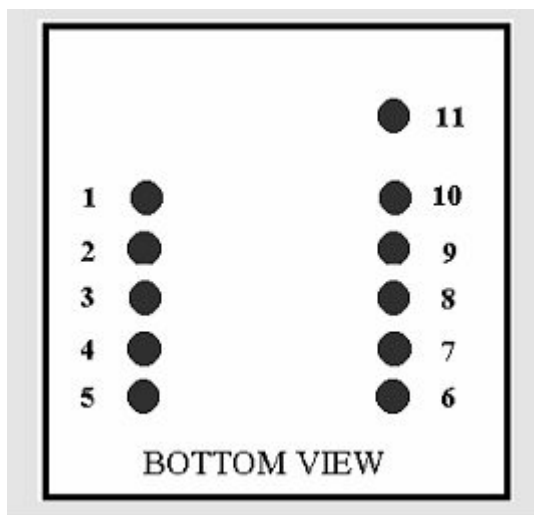
Power Requirements	5V DC at 30mA nominal. A linear regulator is recommended.
Interface	RS232 or Standard 26 bit wiegand format according to customer specifications.
Read Range	12+cm with ISO EM card
Frequency	125KHz standard
Transponder	Read Only.
Audio/visual Indication	LED and Buzzer signal output
Dimensions	26mm x 25mm x Height 7mm
Voltage Supply range	+4.6V through +5.4V
Response Time	Less than 0.1 sec

EM12

Pin Description & Output data formats

Pin No.	Description	ASCII	Magnet Emulation	Wiegand26
Pin 1	Zero Volts and Tuning Capacitor Ground	GND 0V	GND 0V	GND 0V
Pin 2	Strap to +5V	Reset Bar	Reset Bar	Reset Bar
Pin 3	To External Antenna and Tuning Capacitor	Antenna	Antenna	Antenna
Pin 4	To External Antenna	Antenna	Antenna	Antenna
Pin 5	Card Present	No function	Card Present	No function
Pin 6	Future	Future	Future	Future
Pin 7	Format Selector (+/-)	Strap to GND	Strap to Pin 10	Strap to +5V
Pin 8	Data 1	CMOS	Clock	One Output
Pin 9	Data 0	TTL Data (inverted)	Data	Zero Output
Pin 10	3.1 kHz Logic	Beeper / LED	Beeper / LED	Beeper / LED
Pin 11	DC Voltage Supply	+5V	+5V	+5V

Pin-out diagram



Data Formats

Output Data Structure – ASCII

STX (02h)	DATA (10 ASCII)	CHECK SUM (2 ASCII)	CR	LF	ETX (03h)
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[The 1byte (2 ASCII characters) Check sum is the “Exclusive OR” of the 5 hex bytes (10 ASCII) Data characters.]

Output Data Structure – Wiegand26

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	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	P
Even parity (E)													Odd parity (O)													

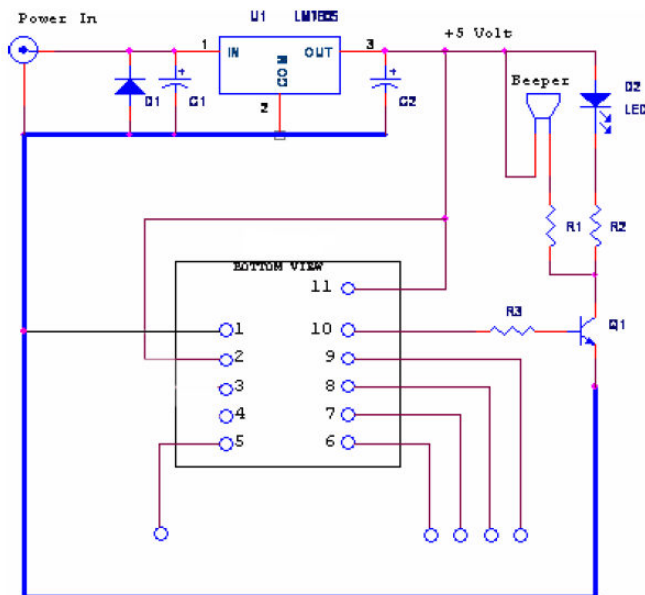
P = Parity start bit and stop bit

Output Data Magnetic ABA Track2

10 Leading Zeros	SS	Data	ES	LCR	10 Ending Zeros
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[SS is the Start Character of 11010, ES is the end character of 11111, LRC is the Longitudinal Redundancy Check.]

Circuit Diagram for the EM12



COMPONENT LIST

R1 = 100R
R2 = 1K
R3 = 1K
C1 = 100uF 16V
C2 = 100uF 10V
Beeper = 2.7-3.5KHz 100R
D1 = 1N4001
D2 = GREEN LED
U1 = LM7805
Q1 = UTC8050 (NPN)