Proximity Reader MF7
Instruction Sheet

Proximity Reader MF7

The MF7 is a very high performance proximity reader featuring medium range and small dimensions. The unit will run from any voltage from 5~18 V (DC). The MF7 also features good read range at 5 Volts , making it ideally suited to a wide variety of applications, particularly access control.

Power Requirements	5~18 Volts regulated DC at 150 mA typical with a 12V supply. A linear regulator is recommended .
Interface	Wiegand , Magstripe ,9.6K Baud Serial ASCII (RS232) Or special to customer specifications .
Typical Maximum Read In ideal conditions	Range 2~5 cm at 5~18V with Mifare card.
Frequency	13.56MHz standard
Transponder	Read Only (For Unique Serial Number / Unique Identifier) Read Only (Mifare Ultralight MF0 ICU1) Read Only (Mifare Standard MF1 ICS50) Read Only (Mifare 4k MF1 ICS70) Read Only (Mifare DESFire MF3 ICD40)
Audio/Visual Indication	Internal LED and Buzzer
Dimensions	8.3 x 4.7 x 1.6 cm
Operating Temperature	-10 to 60 Deg C.
Interface Cable	90 cm

Output Assignment

|		
Red	Power	5-18 Volts
Black	Power	0 Volt
White	Magstripe clock & Wiegand 1 , with internal 4k7 pull up	
Green	RS232 data , Magstripe data & Wiegand 0 , with internal 4k7 Pull up (pull up only for Wiegand and Magstripe)	
Orange	Card Present Output with internal 4k7 pull up	
Yellow	Program Input	
Blue	External Beep. Connect to GND 0 Volts.	
Brown	LED (External source Connect to GND 0 Volts)	

Data out internal circuit configuration
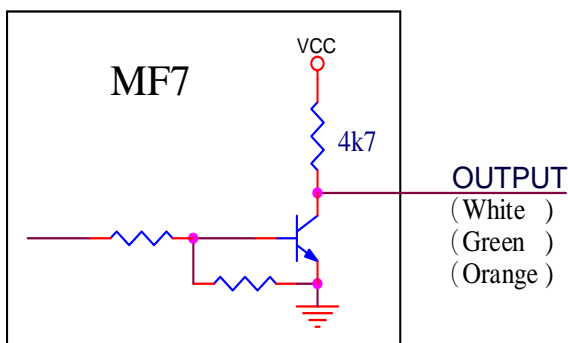
Output Format

The output format can be customer programmed . The available formats are Wiegand , Magnetic Emulation and Serial ASCII (RS232)

Wiegand		**Magstripe**	
Red	Power 5-18V	Red	Power 5-18V
Black	Ground 0V	Black	Ground 0V
White	Data 1	White	Clock (Strobe)
Green	Data 0	Green	Data
Yellow	Connect to White	Orange	Card Present
Orange	No Connection	Yellow	Connect to Orange

Serial ASCII (RS232)

Red	Power 5-18V
Black	Ground 0V
Green	TX Data
Yellow	No Connection
White	No Connection
Orange	No Connection

Data Structure (Serial ASCII)

Baud Rate : 9600,N,8,1

STX(02 HEX)	DATA(8 or 14 HEX CHARACTERS)	CR	LF	ETX(03 HEX)

The start character is factory defined as an 'STX' (02 HEX). This is followed by 8 Hex characters (for Mifare Standard MF1 ICS50、Mifare 4k MF1 ICS70)or14 Hex characters(for Mifare Ultralight MF0 ICU1、Mifare DESFire MF3 ICD40)of data . The CR\LF 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 56 IPS (Inch per Second)

10 LEADING ZEROS	SS	DATA (10 or18 DIGITS)	ES	LRC	10 TRAILING ZEROS

The 10 leading zeros prepare the receiving unit to accept the data. The data is 10 digits long(for Mifare Standard MF1 ICS50、Mifare 4k MF1 ICS70) or 18 digits long (for Mifare Ultralight MF0 ICU1、Mifare DESFire MF3 ICD40). SS is the Start Sentinel consisting of 11010.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 (F77A9FF2) , will be converted to denary and sent as denary 4152008690(10 digits)

The calculation is performed as follows.

$$(2 * 16^0 + 15 * 16^1 + 15 * 16^2 + 9 * 16^3 + 10 * 16^4 + 7 * 16^5 + 7 * 16^6 + 15 * 16^7) = 4152008690$$

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
SYRDSSW1-W26	Site bits from Card (24 bits Card Data)
MSB	Normal 01
LSB	Normal 24

Wiegand Data Timing Specification

Pulse Interval   (TPW)=2.0mS +/- 3%

Pulse Width   (TDW)=100uS +/- 3%
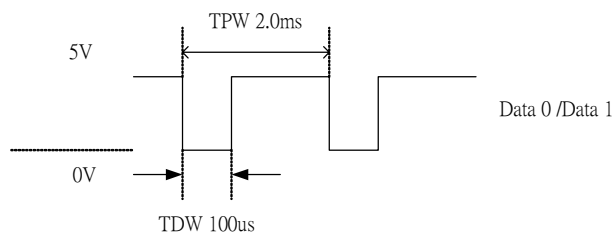
PROGRAMMING THE OUTPUT FORMAT

The programming input may be connected in the following ways to choose between the available output formats.

1) Serial ASCII   Leave Program Input Open C IRCUIT
2) Wiegand   Connect Program Input to Clock Output
3) Clock Data**   Connect Program Input to Data Output
4) Magnetic Emulation   Connect Program Input to Card Present

**(To special order only – Minimum order 1K)