

# Proximity Reader FL20

TM951204-02

**Thank you for purchasing the FL20 Multi-Technology RFID Reader!**

The FL20 is a high performance multi-technology reader reading 125KHz/Mifare/FeliCa card serial numbers. It is the best choice for system integrators because of its wide range of power inputs ( between 5V to 18VDC). The Three-in-One interface, RS232, MSR ABA TK2 and Wiegand allowing it to integrate with a variety of applications, especially security access control.

*\* Mifare is a registered trademark of Phillips Electronics N.V.*

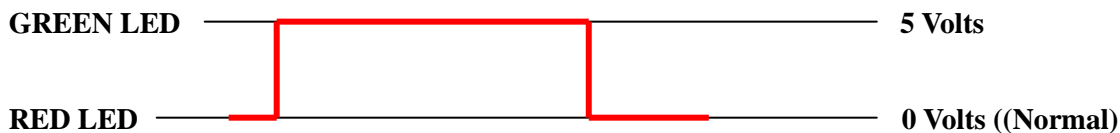
*\* FeliCa is a registered trademark of Sony Inc.*

## Specification

<b>Power Requirements</b>	5~18 Volts regulated DC at 200 mA typical with a 12V supply. A linear regulator is recommended .
<b>Interface</b>	Wiegand , Magstripe ,9.6K Baud Serial ASCII (RS232) or special to customer specifications .
<b>Typical Maximum Read In ideal conditions</b>	125KHz EM format, 13.56 MHz Mifare ISO 14443A standard, 13.56MHz FeliCa ISO18092 standard, Maximum reading distance. Up to 30 mm at 5V-18V with Mifare ISO card if an ideal conditions ; up to 80 mm at 5V~18V with 125KHz EM format card if an ideal conditions .
<b>Frequency</b>	13.56MHz Band (0.65dBuA/m@3m) / 125KHz Band (14.93 dBuA/m@3m)
<b>Transponder</b>	Read only ( for unique serial number/unique identifier).
<b>Audio/Visual Indication</b>	Internal LED and Buzzer
<b>Dimensions</b>	78(L) x 43(W) x 15(D) mm
<b>Housing material</b>	ABS
<b>Interface Cable</b>	90 cm
<b>Environment</b>	Operation Temp : -10 to 60 Deg C. Storage Temp : -15 to 65 Deg C. Humidity : 10 ~ 90 % relative

## Output Assignment

Red	Power 5-18 Volt
Black	Ground 0 Volt
White	Clock Output (Magstripe , Wiegand 1) 2K2 pull up
Green	Data Output (Magstripe ,Wiegand 0) 2K2 pull up
Blue	RS232 RXD
Orange	Card Present Output 2K2 pull up
Yellow	RS232 TXD & Program Input 2K2 pull up
Brown	LED (External source Connect to GND 0 Volts only for Wiegand and Magstripe interface).



※ External Source will decide the pulse.

The externally LED must be operation in the Wiegand or the Magstripe interface. Disable the externally controlled LED operation in the RS232 interface.

## Output Format

The output format can be customer programmed. The available formats are Wiegand.

Magnetic Emulation and Serial ASCII (RS232)

### Wiegand

Red	Power 5~18 V
Black	Ground 0V
White	Data1
Green	Data0
Blue	Floating

### Magstripe (ABA Track 2)

Red	Power 5~18V
Black	Ground 0V
Green	Data
White	Clock (Strobe)
Orange	Card Present
Blue	Connect to Red

### Serial ASCII (RS232)

Red	Power 5~18V
Black	Ground 0V
Blue	RS232 RXD
Blue	Connect to Black (When No Connect to RS232 RXD)
Yellow	RS232 TXD

## Data Structure ( Serial ASCII )

Baud Rate: 9600,N,8,1

STX (02 HEX)	DATA ( 8/14/16 HEX CHARACTERS )	CR	LF	ETX (03 HEX)
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The start character is factory defined as a '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 40 IPS (Inch per Second)

10 LEADING ZEROS	SS	DATA (10/18/20 DIGITS)	ES	LRC	10 TRAILING ZEROS
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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)												

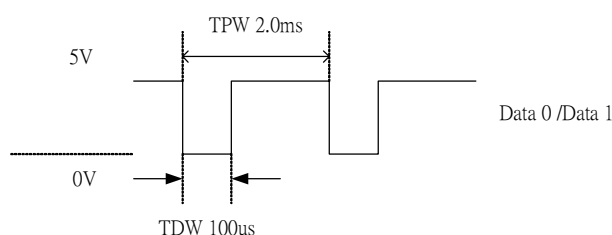
### Note:

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

Available output formats shown as following:

- 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

**Note: For special customized format order is based on minimum 1K qty.**

## Command List :

Serial port setting is: 9600, N, 8, 1. Commands and replies have the following format:

STX (02h)	Command or reply code	CR (0Dh)
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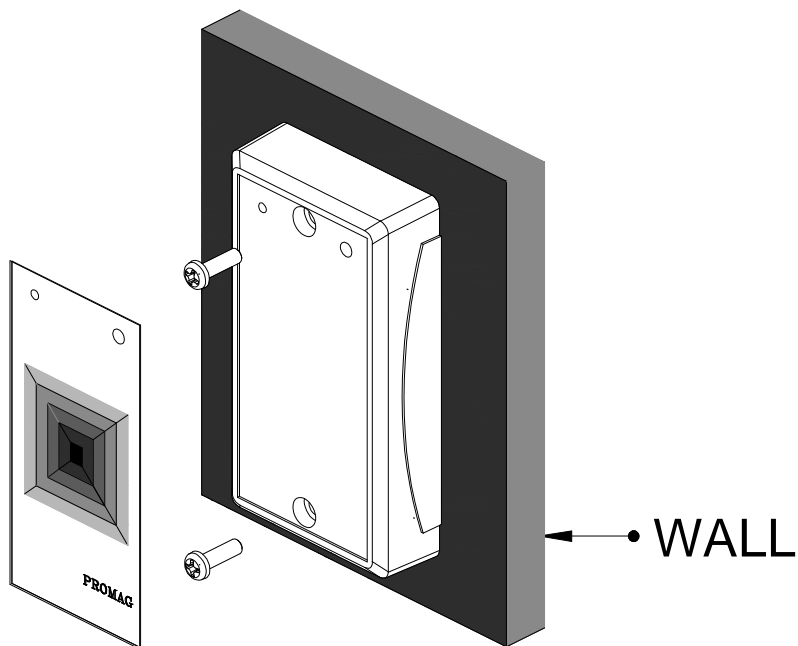
### Currently supported commands are shown below

Switch the green LED on (Green LED enable)	STX (02h)	'J1'	CR (0Dh)
Switch the green LED off (Green LED disable)	"	'J2'	"
Switch the red LED on (Red LED enable)	"	'J3'	"
Switch the red LED off (Red LED disable)	"	'J4'	"
Buzzer beep 1 time	"	'J5'	"
Buzzer beep 3 times	"	'J6'	"
Get firmware version	"	'V '	"

### The FL20 is able to issue the following replies:

Command acknowledged	STX (02h)	'A'	CR (0Dh)
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## Installation sheet



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# Contact Us

## **GIGA-TMS INC.**

### **ADDRESS:**

8F, NO.31, Lane 169, Kang-Ning Street,  
Hsi-Chih Dist, New Taipei City,  
Taiwan

### **TEL:**

886-2-26954214

### **FAX:**

886-2-26954213

### **WEBSITE:**

[www.gigatms.com.tw](http://www.gigatms.com.tw)

### **EMAIL:**

Sales & Product Inquiries - [promag@gigatms.com.tw](mailto:promag@gigatms.com.tw)  
Product & Technical Support - [support@gigatms.com.tw](mailto:support@gigatms.com.tw)



## **CAUTION:**

**The crossed out wheeled bin label that can be found on your product indicates that this product should not be disposed of via the normal household waste stream.**

To prevent possible harm to the environment or human health please separate this product from other waste streams to ensure that it can be recycled in an environmentally sound manner.

For more details on available collection facilities please contact your local government office or the retailer where you purchased this product.

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