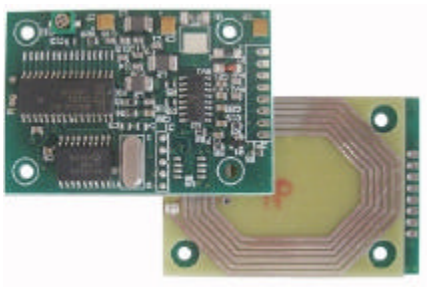
DOC. 216-R2

FR-ISO 13.56MHz ISO15693 READER



FR-ISO

FR-ISO-ONDA

FR-ISO-SHELL

1. FEATURES AND SPECIFICATIONS

The FR-ISO is a Front Side Tag Reader with **built-in Antenna**, operating with:

TRANSPONDERS SUPPORTED:

ICODE-SLI
EM4135 EMM
MB89R118 FUJI
TAG-IT TEXAS

- Automatic detect of transponder type.
- Standard ISO Card Readers Track 2.
- Compatibility with the TR-SERIES modules.
- Decode the **Serial Code Number** inside the Tag 5 Bytes (00H-UID0-UID1-UID2-UID3).
- No Anti-collision.
- Three Outputs (TAG-PRESENT, DATA and STROBE) can be paralleled with other devices (i.e. magnetic card readers).
- Three Operating Mode available:
  a) **Converted** : 10 hex digit (TAG) converted hex-dec to 13 decimal digit data out:
  Manufacturer Code (3 decimal digits in the range 000 to 255)
  Serial Code (10 decimal digits in the range 0 to 4.294.967.295)
  b) **Transparent** : 10 hex digit(TAG) converted to 20 decimal digit data out.
  c) **Wiegand** 26 bit.
- 5VDC
- ISO interface at fixed 600 baud.

1.1 CONFIGURATIONS

FR-ISO-IS-5	Converted format. Tag data are hex-dec converted in two fields (Manufacturer and Serial code).
FR-ISO-IT-5	Transparent format. Tag data are directly transmitted in 20 decimal digit format.
FR-WIE-IT-5	Wiegand 26 bit format.

Glossary
FR= Transponder reader **ISO**=TTL ISO interface **S**=Converted mode **T**=Transparent mode **W**=Wiegand 26 bit
5= Power Supply

1.2 SPECIFICATIONS

OPERATING

Power Requirements	FR-…5 Version: 5 VDC ? 5% at max.50mA max. Ripple 10mVp-p
Output Signal Level TTL Interface	Vol = 1 VDC max at 6mA Voh = 3.5 VDC min at 6mA
Speed	600 bits per second
Reading Distance (with TAG in center of RF field)	CARD typ 40 mm

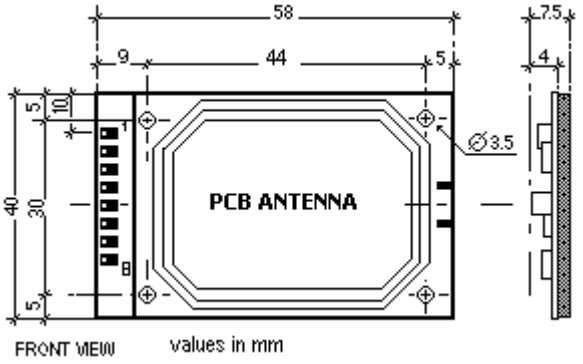
MECHANICAL

Dimensions	Length Width Height	58mm 40mm 7.5mm
Weight		Max 30g

ENVIRONMENTAL

Temperature	Operating Storage	-10 C to 50 C -40 C to 80 C
Humidity	Operating Storage	10% to 90% non condensing 0% to 95% non condensing

1.3 DIMENSIONS



2.0 CONNECTION

The on-board connector is an **8 pin .1" (2.54mm) soldering type**.

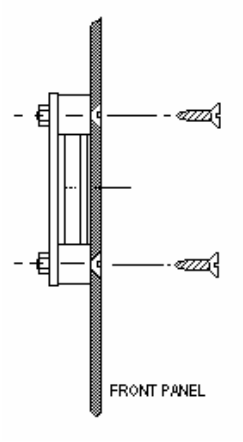
PIN	DESCRIPTION	
1	+5VDC (suffix-5)	
2	GND	
3	TAG Present	TTL output
4	Data	TTL output.
5	Strobe	TTL output.
6	Mode	TTL input.
7	Out1	Open Collector output.
8	LED-OUT	TTL output trough internal 2.2k?

2.0.1 WIEGAND CONNECTION

The on-board connector is an **8 pin .1" (2.54mm) soldering type**.

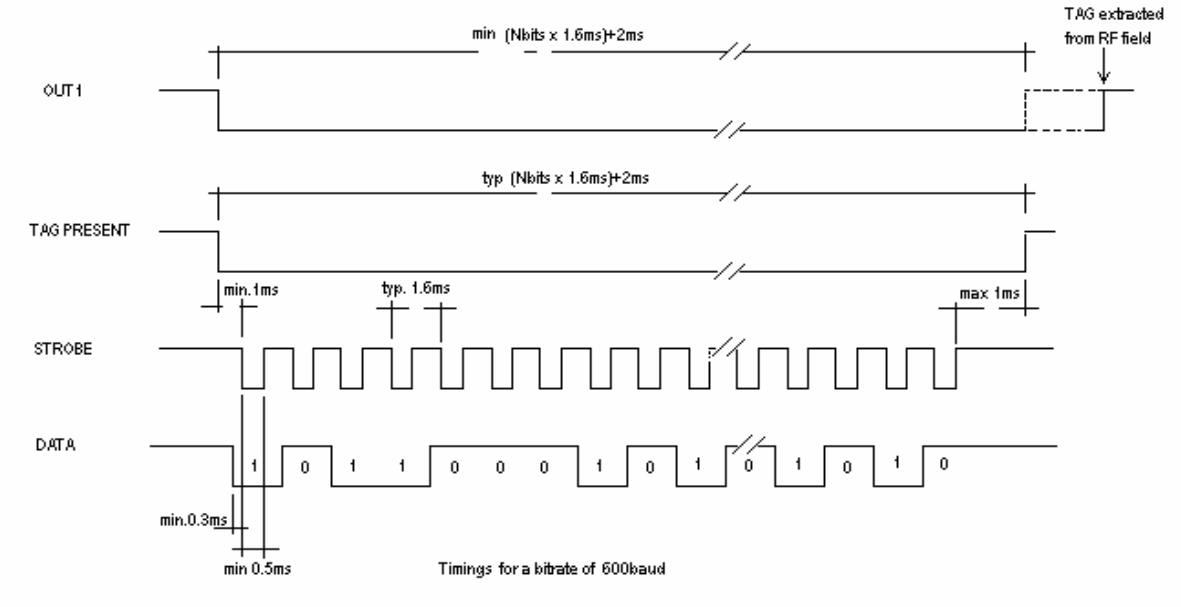
PIN	DESCRIPTION	
1	+5VDC (suffix-5)	
2	GND	
3	No connect	
4	Data-1	TTL/TRISTATE output. Ext. pull up at 5V min. value 2 K
5	Data-0	TTL/TRISTATE output. Ext. pull up at 5V min. value 2 K
6	Inhibit	TTL input.
7	Out1	Open Collector output.
8	LED-OUT	TTL output trough internal 2.2k?

2.1 MOUNTING



Due to the Radio Frequency emissions of the Reader Antenna is important to avoid the usage of metal panels in front, rear and lateral sides of the Reader.
Although the FR-ISO provides an high resistance to EMC corruption, avoid to install it in high RF emission environments, the reading distance may result drastically reduced.

2.2 TIMING



FR-ISO-IS/T timings

2.2.1 TAG PRESENT
The Tag Present signal goes low when a TAG/CARD is moved in the RF-Field and data are correctly read.
Remains low for all data transmission. It will goes high at the end of data transmission.
2.2.2 DATA
The Data signal is valid while the strobe is low. The Data level high indicates a bit value of Zero.
2.2.3 STROBE
The strobe signal indicates when valid data are present.
It is recommended that Data be loaded with the falling edge (negative transition) of the Strobe.
2.2.4 LED-OUT
The LED-OUT is a TTL output, active high, with a 2.2k? internal series resistor suitable to drive an external LED connected to GND.
It will turn ON when a KEY/CARD is moved in the RF-Field and is correctly read.
It will turn OFF when the KEY/CARD is removed by the RF-Field.
2.2.5 OUT1
The Out1 is an Open Collector output, active low, driving a max. load of 80 ma at 12VDC.
It will turn ON when a KEY/CARD is moved in the RF-Field and is correctly read.
It will turn OFF when the KEY/CARD is removed by the RF-Field.

3.0 FORMAT FR-ISO-IS
The data read from the TAG are **Hex-Dec math** converted into two blocks: Manufacturer Code (1 Hex = 3 Dec) and Serial Code (4 Hex = 10 Dec).

Example of UID Hex stream: **49H-96H-02H-D2H** Dec converted is **SC=1234567890**
The FR-ISO-MS is formatted in ISO mode sending 3(MC)+10(SC) decimal digits to the HOST, as described below.
The MC is always 000 dec.

Preamble START MC 0' MC 1' MC 2' SC 1' SC 2' SC 3' SC 4' SC 5'
000000000-1101(0) - 0000(1) -0000(1) - 0000(1) - 1000(0) - 0100(0) -1100(1) - 0010(0) -1010(1)
SC 6' SC 7' SC 8' SC 9' SC 10' END LCR Postamble
-0110(1) - 1110(0) - 0001(0) - 1001(1) – 0000(1) - 1111(1) - 0110(1) - 000000000

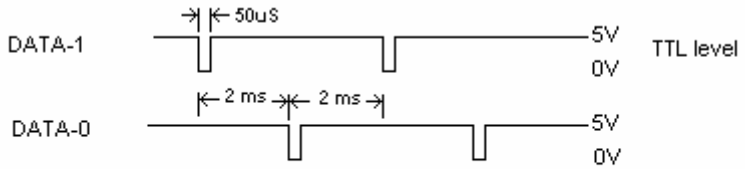
3.1 FORMAT FR-ISO-IT
The data read from the TAG are transparently transmitted to the HOST.
To be ISO formatted, the TAG data content is formatted in 20 decimal digits to the HOST , as described below.

Data from **0 Hex to 9 Hex** are converted as **00 Dec to 09 Dec.**
Data from **A Hex to F Hex** are converted as **10 Dec to 15 Dec.**
The other terms are the same as previously described in par. 3.0.

Example:
If TAG contains an Hex code : **80 B6 83 4E**
The data will be so converted in Dec code: **00 00 08 00 11 06 08 03 04 14**
The stream transmitted will be:

Preamble START 0' 0' 0' 0' 0' 8' 0' 0' 1' 1' 0'
000000000 - 1101(0) - 0000(1) -0000(1) - 0000(1) - 0000(1) - 0000(1) -0001(0) - 0000(1) -0000(1) -1000(0) - 1000(0) - 0000(1)
6' 0' 8' 0' 3' 0' 4' 1' 4' END LCR Postamble (20 bit)
- 0110(1) - 0000(1) - 0001(0) - 0000(1) - 1100(1) - 0000(1) - 0010(0) - 1000(0) - 0010(0) - 1111(1) - 0100(0) – 00000000000000000000

3.2 WIEGAND PROTOCOL & TIMING



WIEGAND TIMING

The Wiegand Protocol is 26 bit mode so formatted:
The three low significant bytes on the UID has sent to the Host
Example: an UID CODE is : **80-52-35-1A**
Only the variable part **52-35-1A** has sent to the HOST.
The Wiegand format is:

E Bit0 …… Bit11 Bit12.....Bit23 O

E= Parity even. If the number of ones in the Bits 1 to 11 is odd, then E=1, otherwise is 0.
O= Parity Odd. If the number of ones in the Bits 12 to 23 is even, then O=1, otherwise is 0.

In the example the bit are so structured:

E B0 B11 B12 B23 O
1 0101 0010 0011 0101 0001 1010 0

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