

PRM 5

Wiring and Installation Instructions

V 1.0 12/00

FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Information to user:

Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

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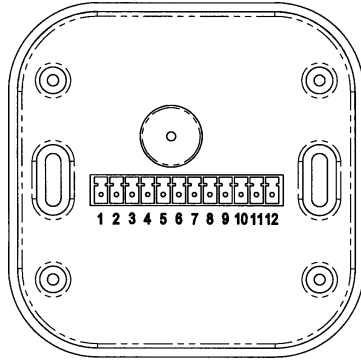
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1 Technical Data

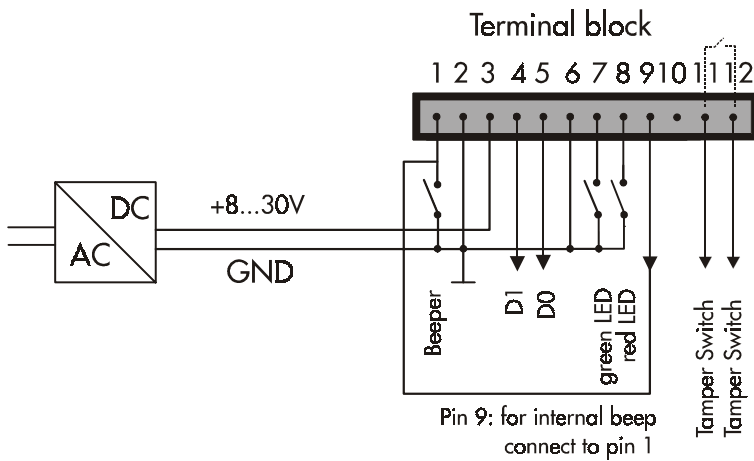
Mounting:	<ol style="list-style-type: none">1. Flush mounting in non-metallic surfaces2. Surface mounting using an AP5 spacer3. Mounting on single-gang electrical box using fixing plate FM 5
Material:	ASA plastic housing; polyurethane encapsulated electronics
Housing dimensions:	80 x 80 x 16 mm
Temperature range:	-25...+70 °C
Power supply:	8...30 V DC <100 mA
Electrical protection:	Reverse polarity diode protection on power lines; high-speed transient voltage suppressor diodes on data lines
Protection type:	IP 65 (IEC 529)
Frequency:	13.56 MHz
Approvals:	CE, EN 300 330 (European post)
Reading distance:	Up to 3 cm (depending on installation and transponder type)
Data output mode:	<ol style="list-style-type: none">1. One transmission per activity2. Cyclical transmission
Interface:	<ol style="list-style-type: none">1. Wiegand 2-wire (open collector)2. Data/Clock (open collector)3. Magstripe emulation (open collector)4. RS 2325. RS 4856. F2F Supervised
Electrical connection:	12 position plug-in strip connector with screw terminals
Beeper:	External control
Red LED:	External control
Green LED:	External control
Yellow LED:	Indicates power to the reader

2 Wiring Diagram

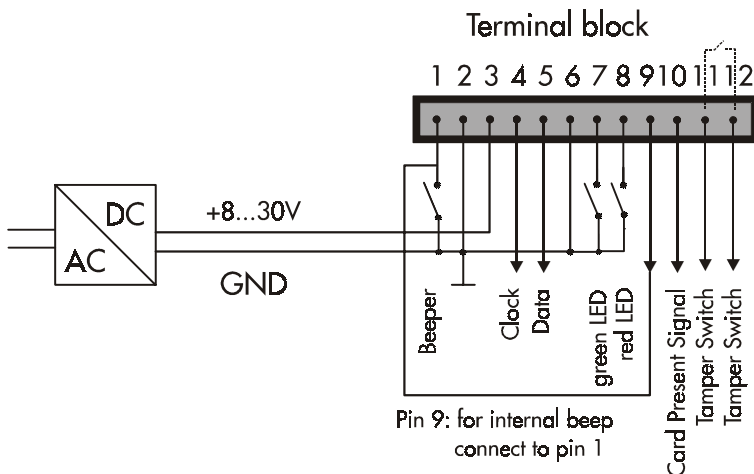


Rear view of the reader

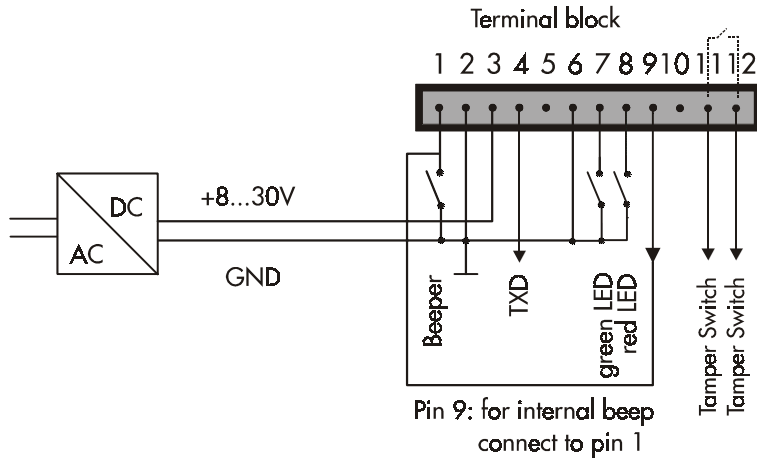
2.1 PRM 5 Wiegand 2-wire



2.2 PRM 5 Magstripe Emulation

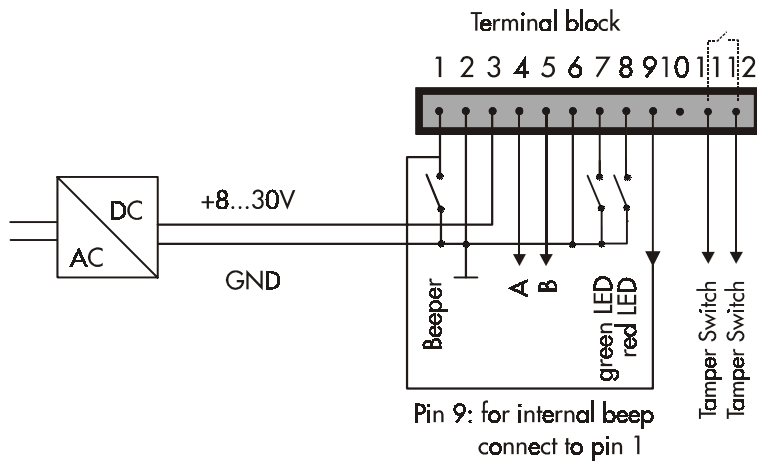


2.3 PRM 5 RS 232

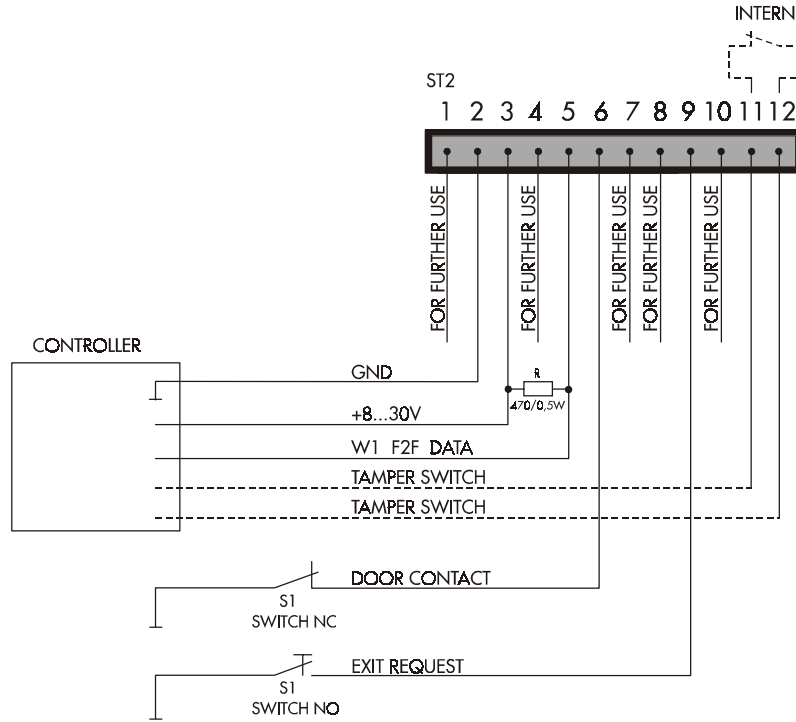


RXD can be connected to Pin 5, but without any function.

2.4 PRM 5 RS 485

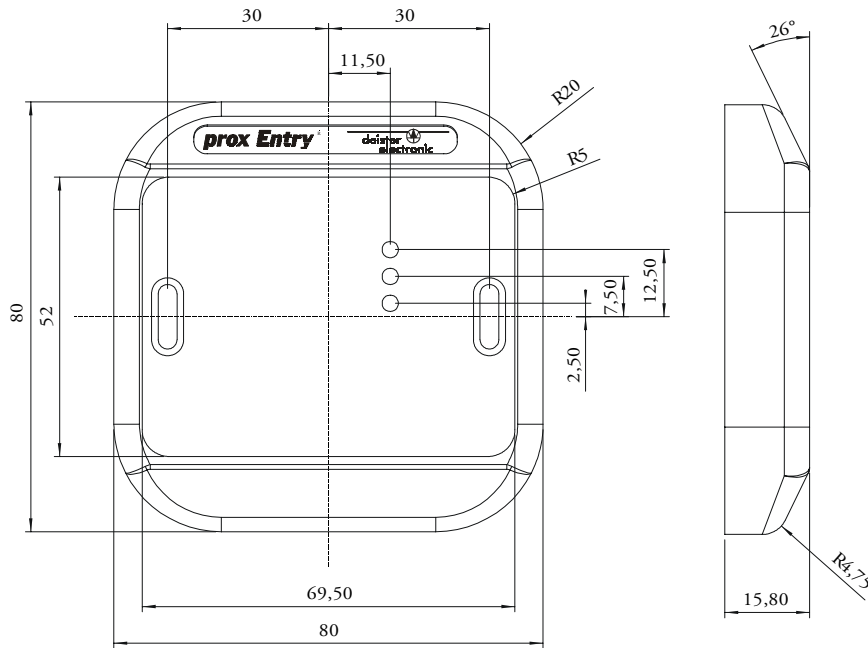


2.5 Supervised F2F



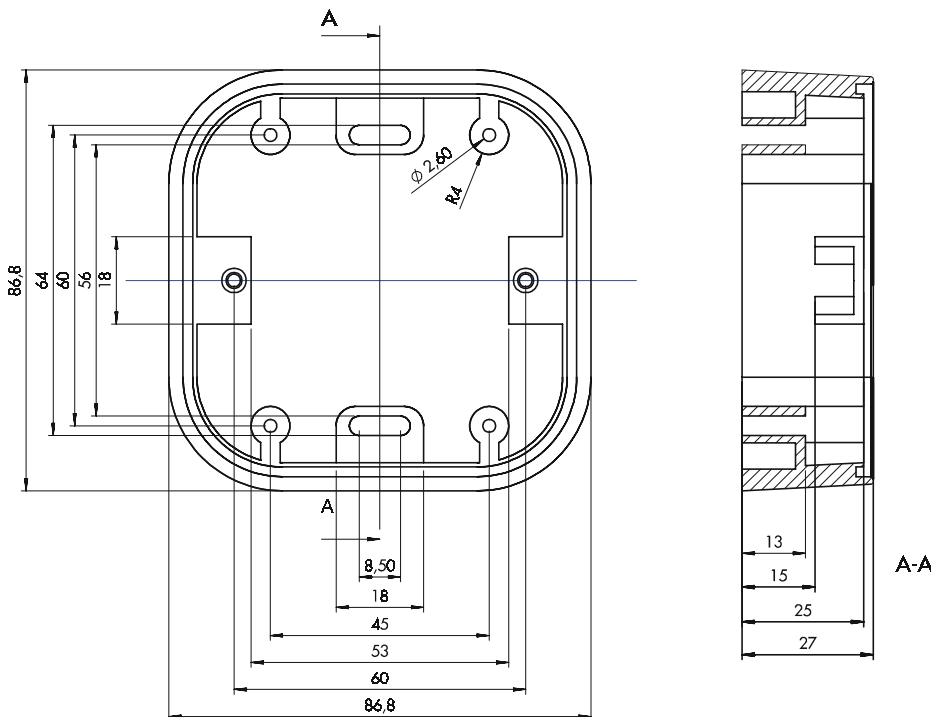
3 Mechanical Dimensions

3.1 PRM 5 Reader



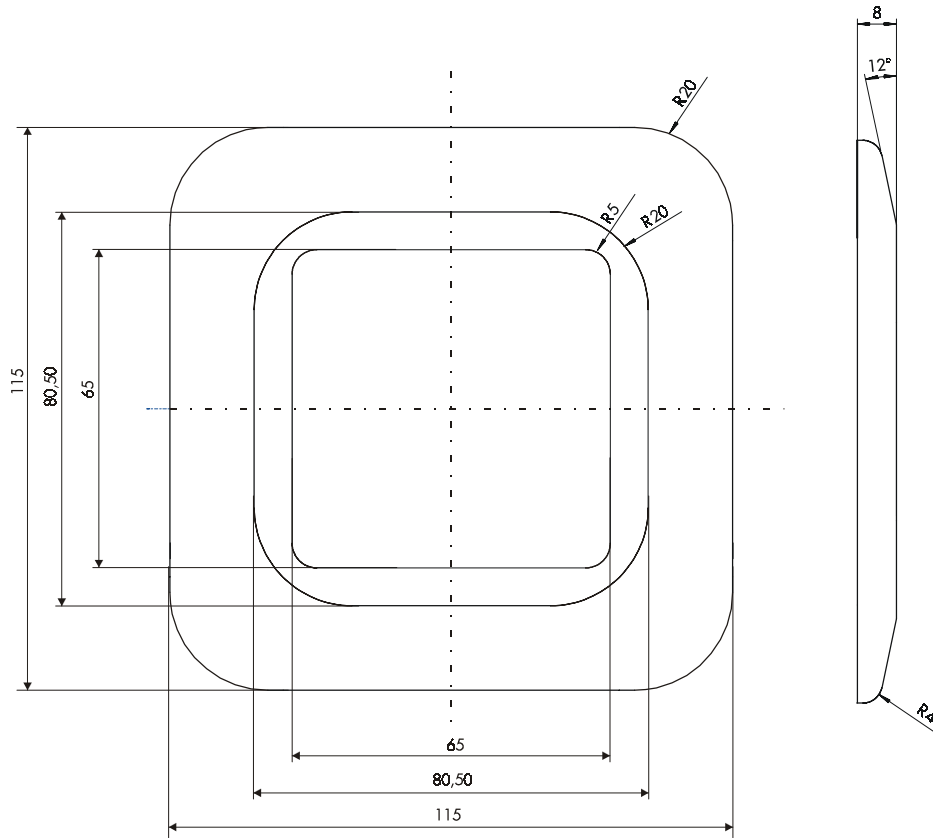
All dimensions in mm

3.2 Surface Spacer AP5



All dimensions in mm

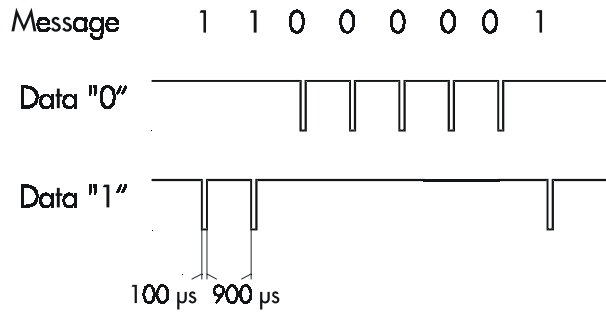
3.3 Flush Mounting Bezel FM5



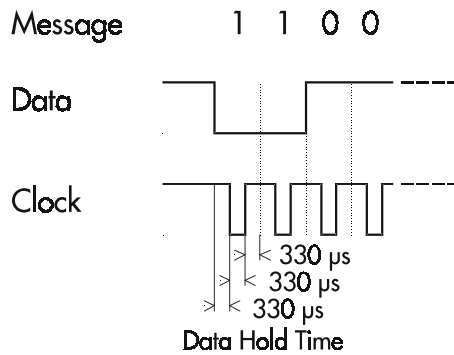
All dimensions in mm

4 Communications Protocol

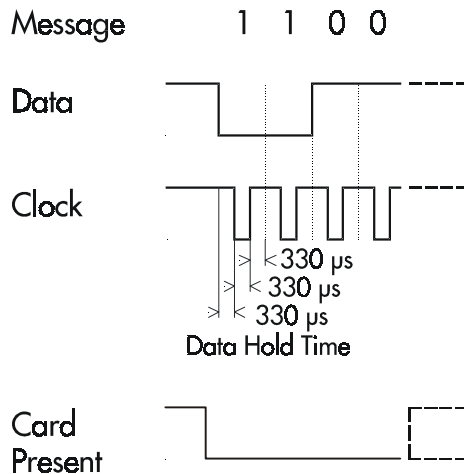
4.1 Wiegand Standard



4.2 Data/Clock



4.3 Magstripe Emulation



4.3.1 Magstripe Interface according to ISO 7811/2-1995 - Track 2

Data Encoding Table

Value	Bitpattern	Meaning
0	0 0 0 0-1	"0"
1	1 0 0 0-0	"1"
2	0 1 0 0-0	"2"
3	1 1 0 0-1	"3"
4	0 0 1 0-0	"4"
5	1 0 1 0-1	"5"
6	0 1 1 0-1	"6"
7	1 1 1 0-0	"7"
8	0 0 0 1-0	"8"
9	1 0 0 1-1	"9"
10 (Ahex)	0 1 0 1-1	unused character
11 (Bhex)	1 1 0 1-0	start sentinel (start character)
12 (Chex)	0 0 1 1-1	unused character
13 (Dhex)	1 0 1 1-0	field separator
14 (Ehex)	0 1 1 1-0	unused character
15 (Fhex)	1 1 1 1-1	end sentinel (stop character)

The least significant bit of every digit is sent first; the fifth bit is an odd parity bit for each group of 4 data bits.

The complete message always looks as follows:

left edge - start - data characters - end - LRC - right edge

The LRC is calculated by the following procedure:

Each of the 4 bits in the LRC character is an even parity bit of the equivalent bits in the telegram including start and stop sentinel; i. e. the first LRC bit is an even parity bit for all the least significant bits in the telegram and the 4th bit of the LRC is the even parity of all the most significant bits.

The fifth bit is the odd parity of the 4 LRC bits (it is not calculated over all the parity bits).

On magstripe cards the space left and right of the information (edge) is filled with an unknown number of zero bits (this is not a valid character as the parity is invalid). As most terminals need some of the zero bits (known as "clocking bits" too) and do not care about additional zero bits, deister decided to send 16 zero bits at the left edge as well as to the right edge.

The parity bits, the start and end characters, the LRC and the zero bits at the edge are generated automatically by the reader.

On the one hand, they do not require space in the transponders (therefore we can encode 16 digits for the user), on the other hand this means that there will be a problem if one of the fields is missing.

Example:

The short information "86" would be transmitted as follows:

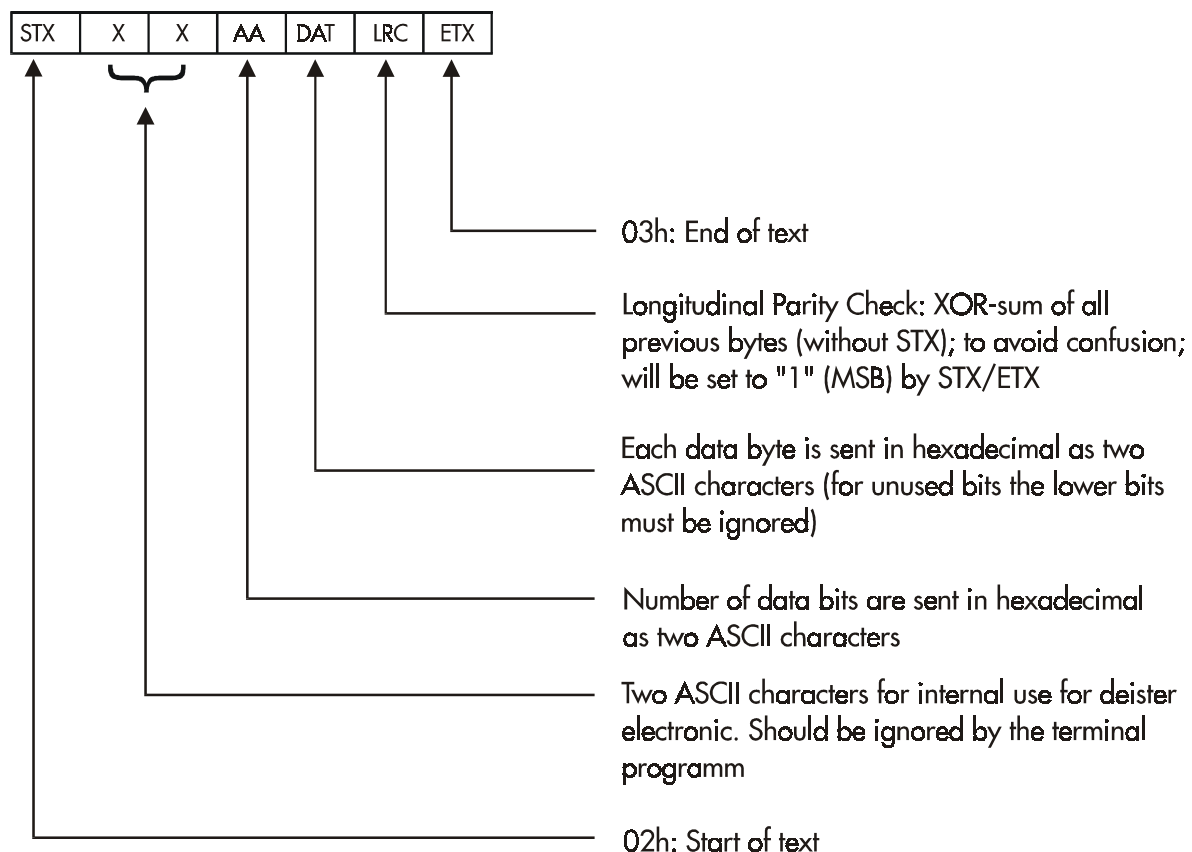
0000000000000000-11010-00010-01101-11111-01011-0000000000000000
 edge start "8" "6" stop LRC edge

A "1"-bit is transmitted as a logic low level; the falling as well as the rising edge of the clock pulse may be used to clock in data.

4.4 Protocol for PRM 5 with RS 232/RS 485 Interface (no Partyline protocol)

The interface is operated using 9600 baud, 8 data bits, 2 stop bits and no parity bit.

Message Format: Example



Transponder data:					0101	0101	0111			
Data transmitted from reader:										
02h	"R"	"E"	"0"	"C"	"5"	"5"	"7"	"0"	E3h	03h
↓								↓		
first character Tx								undefined, bits to fill incomplete byte		

Calculation of the parity:

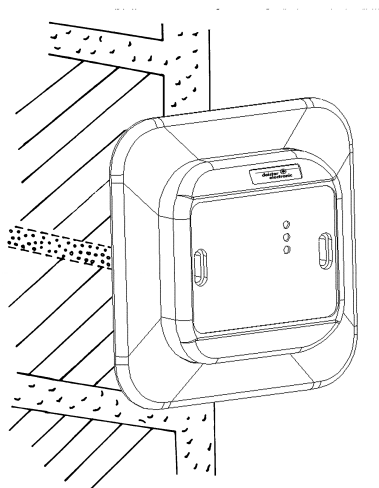
$$LRC = 80h \text{ OR } [52h \text{ \AA } 45h \text{ \AA } 30h \text{ \AA } 43h \text{ \AA } 35h \text{ \AA } 35h \text{ \AA } 37h \text{ \AA } 30h] = E3h$$

("Å" means Exclusive-OR)

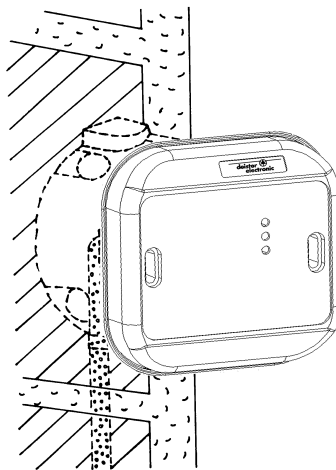
5 Installation

5.1 PRM 5 Reader

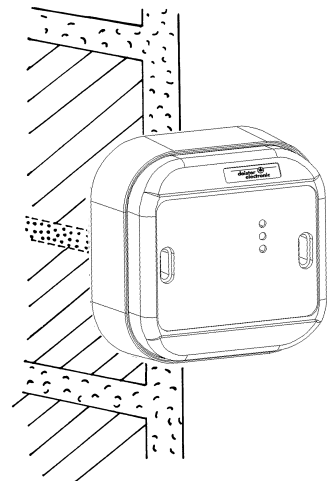
The PRM 5 reader can be surface mounted using an AP 5 spacer, or flush mounted direct to an European round style back box.



Flush mounted with FM5 bezel



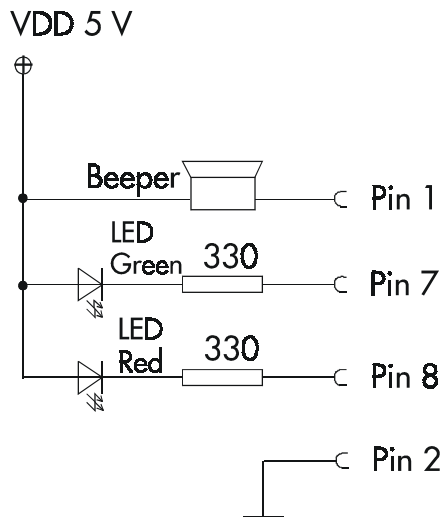
Flush mounted directly with a European round back box



Surface mounted with AP5 spacer

6 Installation

6.1 Indicators

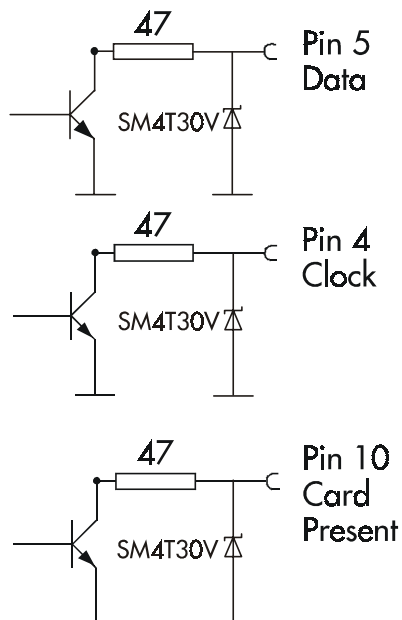


Function of LED's and beeper (except Supervised F2F protocol):

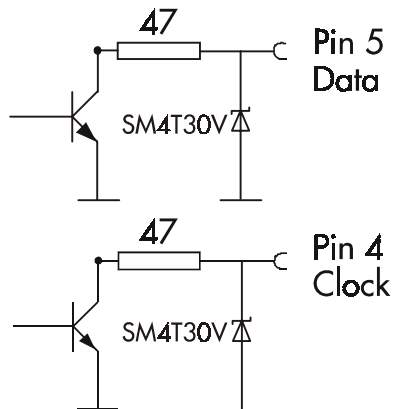
Yellow LED:
Reader is operational. Momentarily flashes during the reading of a card.

Green LED, red LED, beeper:
The function of these indicators is dependant on how they are connected to the controller.

6.2 Magstripe Emulation



6.3 Wiegand/Data/Clock



Note:

For all interfaces except RS 232/485 the pull-ups must be connected to the clock and data lines.

7 Appendix

7.1 Supervised F2F

It is possible to switch between native and compatible mode using special programming cards.