

RAILWAYS Range

Beacon

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OMR81 C

Commutable Beacon

DESCRIPTION

Read-only reprogrammable electronic beacon:

- Memory capacity : 2 bytes (standard) or up to 512bits.
- No battery.
- Radio frequency section is remotely powered.
- Remote reading : 5 different codes
- Code of beacon activated by wayside commands
- Presence detection
- General environment conditions according to EN 50125-3.
- Railways applications.

The Commutable Beacon can be read by a MOL81 type reader and can be programmed with a LPP1712 handheld reader/programmable tool.

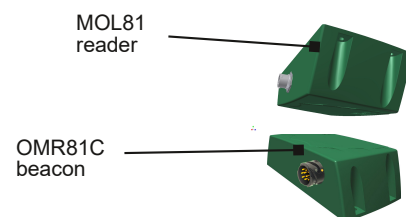


FUNCTIONAL DATA

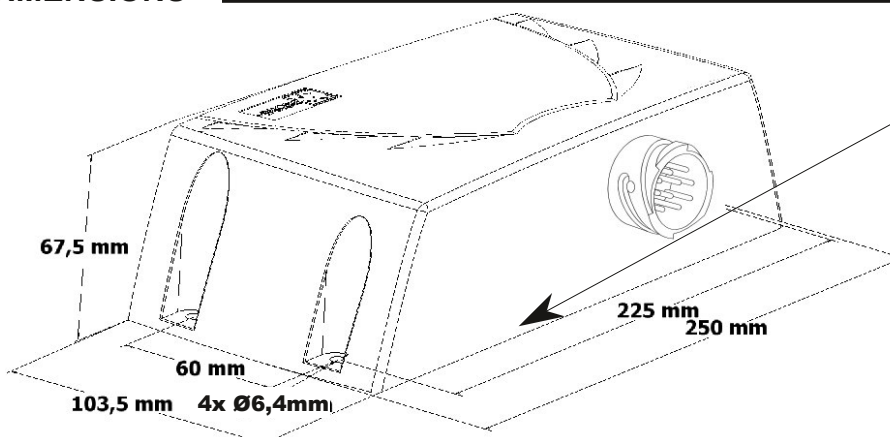
The OMR81C beacon has 3 inputs, each input corresponds to a code to be activated. The fourth code is activated when all inputs are disabled or when the connector is disconnected (code 'life') and the fifth code is activated when at least 2 inputs are enabled (code 'input fault').

The OMR81C beacon must be secured on sleeper between the rails transversely to direction of travel and reader MOL 81 also mounted transversely on underside of train.

The distance between the upper face of the beacon and the lower face of the reader must typically lie between 100mm and 700mm.



DIMENSIONS



Marking :

Part number identification :
OMR81 C

Serial number identification :
yywwxxxxx-nnn-v

yy = year
ww=week
xxxxxx= manufacturing order
nnn=serial number
v=revision index

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TECHNICAL SPECIFICATIONS

| | Min. | Typ | Max. | Unit |
|--------------------------------------|---|------|------|------|
| Radio frequency communication | | | | |
| Carrier | | 6.78 | | MHz |
| Reading range with MOL81 reader | refer to reader specifications to recommend reading range | | | - |

Memory

| | EEPROM | | | |
|--|-----------|-------|-----|---------|
| Technology | | | | |
| Memory capacity | | 16 | 512 | bits |
| Data rate | | 31.25 | | kbits/s |
| Time delay before availability (start-up time) | | | 5 | ms |
| Number of reads | Unlimited | | | |
| Data retention | 40 | 200 | | years |

Environment

| | | | | |
|---|--|--|--------------------|------------------|
| Operating temperature | -25 ⁽¹⁾ | | +70 ⁽²⁾ | °C |
| Storage temperature | -40 | | +85 | °C |
| Electromagnetic compatibility (EMC) | EN 50121-4 | | | - |
| Radiofrequency | EN 300330 | | | - |
| Human exposure | EN 50364 | | | - |
| Electrical safety | EN 60950 | | | - |
| Shocks and vibrations when mounted on sleeper | EN 50125-3 | | | - |
| Fire and smoke | EN 45545 : R23 / HL2 | | | - |
| Ingress protection rating | EN 60529 : IP67 | | | - |
| Temperature cold test - dry heat test | EN 60068-2-1 & EN 60068-2-2 | | | - |
| Temperature damp heat test EN 60068-2-30 | +55°C insulation resistance >10MΩ | | | - |
| Humidity EN 50125-3 / EN 60068-2-30 Db | Class TX: outdoor ambient air + tunnel | | | - |
| Altitude air pressure : EN 50125-3 | 1 200 | | | m |
| Solar radiation EN 50125-3 | 1 120 | | | W/m ² |
| Rapid temperature variations | EN 60068-2-14 : -25°C to +85°C | | | - |
| Low temperature storage | EN 60068-2-1 : -40 °C | | | - |
| Salt mist test | EN60068-2-11 : 500h | | | - |
| Guarantee of operation under water | Test under 200 | | | mm |
| Guarantee of operation under ice | Test under 100 | | | mm |
| Guarantee of operation under stones of ballast | Test under 100 | | | mm |
| Guarantee of operation under mud | Test under 50 | | | mm |
| Guarantee of operation under snow : fresh snow or sleet | Test under 150 | | | mm |
| RoHS European directive 2011/65/EU and REACH European directive n°1907/2006 | Compliant | | | - |
| RED European directive 2014/53/UE | Compliant | | | - |

⁽¹⁾ : high derating of the reading range at -40°C

⁽²⁾ : including the possible effects of altitude and solar radiation

RAMS features

| | | |
|---|--------------------------------|---|
| MTBF according to IEC62380 (informative data) | fixed installation : 1 140 000 | h |
|---|--------------------------------|---|

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TECHNICAL SPECIFICATIONS

Enclosure

| | Min. | Typ | Max. | Unit |
|--|------|-------|------|------|
| Material | | PA6 | | |
| Weight | | 2 500 | | g |
| Coating | | PU | | |
| Recommended tightening torque (4 screws) | | 5 | | N.m |

Digital Inputs for activation

| | | | | |
|--------------------------------------|-----------|----|----|----|
| Low level '0' : V_{IL} | | | 5 | V |
| High level '1' : V_{IH} | 10 | 24 | 35 | V |
| Input current (each input) | | | 50 | mA |
| Protection against reversed polarity | protected | | | - |
| Activation level | high | | | - |

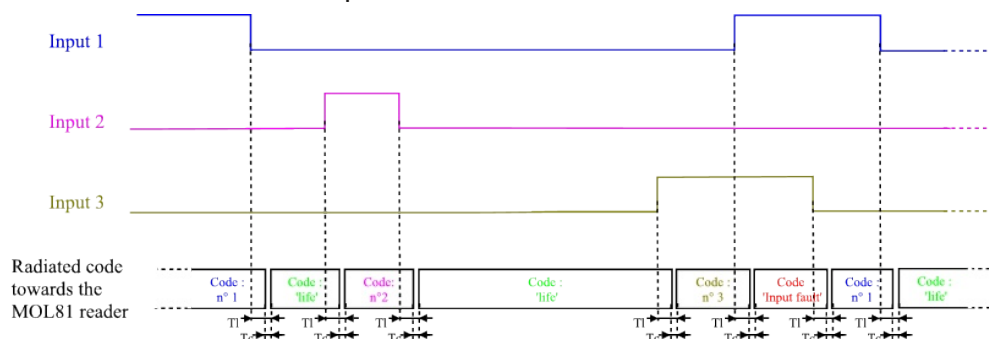
Presence detection

| | | | | |
|------------|--|----|----|---|
| DC Voltage | | 24 | 35 | V |
| Current | | | 1 | A |

Insulation between Groups

| | | |
|--|-------|------|
| n°1 : Input 1 | - | - |
| n°2 : Input 2 | - | - |
| n°3 : Input 3 | - | - |
| n°4 : Presence detection | - | - |
| n°5 : Body of connector, shield of cable | - | - |
| Insulation voltage between each group | 2 000 | Vrms |
| Insulation resistance between each group @500Vdc | 1 | GΩ |

The emitted code is a function of the inputs



Tl : Latency time
Tc : Commutation time

- Code 4 (or code 'life') is activated when all inputs are disabled
- Code 5 (or code 'input fault') is activated when at least 2 inputs are enabled
- Connector disconnected is equivalent to all inputs '0'
- The latency time Tl is at most 100ms
- The commutation time Tc is at most 7ms

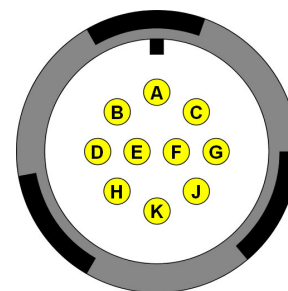
| Input 1 | Input 2 | Input 3 | Radiated code |
|---------|---------|---------|---------------|
| 0 | 0 | 0 | 'Life' |
| 0 | 0 | 1 | 3 |
| 0 | 1 | 0 | 2 |
| 0 | 1 | 1 | 'Input fault' |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 'Input fault' |
| 1 | 1 | 0 | 'Input fault' |
| 1 | 1 | 1 | 'Input fault' |

CONNECTIONS

• Cable

- 3x2 conductors.
- 1 overall shield; full 360° contact with the metallic connector housing.
- Conductors connected by crimping; wire cross section: 0.5 to 1.5 mm².
- Outer diameter of the cable: 8 to 12.5 mm.

| Pin | Assignment |
|-----|-----------------|
| A | Input 3 : 0/24V |
| B | Input 3 : 0V |
| C | nc |
| D | Pres Det-1* |
| E | Pres Det-2* |
| F | Input 1 : 0V |
| G | Input 1 : 0/24V |
| H | Input 2 : 0V |
| J | nc |
| K | Input 2 : 0/24V |

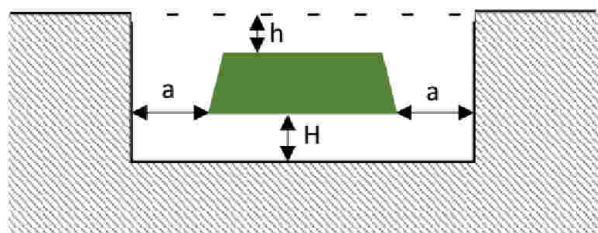


VGE1 type connector from Souriau
Pin side view of the male receptacle
or wiring side view of the female plug

(*) : Pins D and E are internally shorted. This can be used for a presence detection of the OMR81C beacon, a daisy chain configuration is possible.

MOUNTING SPECIFICATIONS

• Metal environment:



The performance is function of metallic environment :

To ensure maximum performance, the OMR81C beacon should be placed on a surface without metal, with $H > 10\text{cm}$. The beacon can be mounted directly onto a metallic surface ($H=0$) with a derating of reading range around 15 to 20%.

The OMR81 C beacon must be placed away from any metal with at least $a=10\text{cm}$ in both directions.

Beyond this distance "a", the device can be recessed in metal, but not deeper than the height of the case ($h=0$).

The beacon can be recessed in electrically insulating material.

• Fixing:

Fixing will be carried out by 4 screws M6 (not provided), the OMR81C beacon has 4 metallic inserts (stainless steel type A4 - 316L) for fixing.

• Neighbouring OMR81 C beacons

- The distance between two OMR81 C beacons must be 2m minimum.
- 2 beacons in the same reader field will be not read.

ACCESSORIES (to order separately)

- 10-pin female plug for $\varnothing 8$ to 12,5mm cable : FFM SOU VGE1/10P for straight version and FFM C SOU VGE1/10P for right angle version.