

LASERMET IS-MDC-12 INSTRUCTION MANUAL



CODED DUAL CHANNEL MAGNETIC DOOR CONTACT

LASERMET IS-MDC-12 Instruction Manual

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1 Declaration of Conformity



**LASERMET LIMITED
CODED MAGNETIC DOOR CONTACT
Part no. IS-MDC-12**

DECLARATION OF CONFORMITY

This is to certify that the Coded Magnetic Door Contact designated by Lasernet Part Number IS-MDC-12 has been tested in accordance with the following directives and standards and found to comply.

Lasermet certifies that this product complies with the basic requirements for health and safety as provided by the following directives and standards:

Directives: Machinery Directive 2006/42/EC
Relevant parts of Low Voltage Directive 2014/35/EU

Standards: EN ISO 13849-1:2015
Safety of Machinery – Safety-related parts of Control Systems
EN ISO 60947-5-3:2013
Low Voltage Switchgear and Control
BS EN ISO 14119:2013
Safety of Machinery – Interlocking Devices associated with Guards

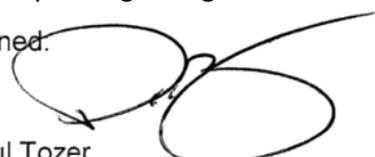
Supplier:

Lasermet Limited
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Dorset
United Kingdom

Country of Origin: England

Signed.

Paul Tozer
Managing Director



Date: 10 June 2019



2 Safety Warnings

This device is intended to be used as part of a safety system which may be used to protect personnel and equipment from possible injury, damage, or loss.

As such it must be installed and wired according to these instructions and tested by suitably qualified persons. No attempt may be made to tamper with the parts, open them, or use them outside of the parameters contained herein.

The units are only designed to be fixed to surfaces using their inbuilt fixing holes. They must not come into contact with each other or any other moving part when in use. The parts should never be subject to impact or mechanical strain.

Safety switches should never be defeated or bypassed. It is imperative that all steps are taken to ensure that any spare actuators are made unavailable, such that they cannot be used to defeat the switch or reduce the protection offered by the system in any way.

3 Concept

The Lasermet IS-MDC-12 is a dual channel coded magnetic door safety contact. It is ideal for use in conjunction with Lasermet's ICS range of laser interlock controllers as part of a safety interlock system.

It is used to detect when a door or other moveable cover forming part of a protective enclosure is open. The IS-MDC-12 features three contacts, two of which are closed and one of which is open when the door is closed. All three contacts change over when the door is open.

The IS-MDC-12 can achieve Performance Level 'e' as specified in EN ISO 13849-1:2015 when correctly wired to a suitable interlock controller such as Lasermet's ICS-6.

4 Summary of Evaluation of Compliance to EN ISO 13849-1:2015

To achieve a complete system performance level 'e' the system must be wired as described in this manual using suitably rated door sensors and measures taken to minimise the effects of common cause failures in the sensors and wiring which may be connected to the unit.

Achieved Characteristics:

Architecture	Category 4
Performance Level (PL)	PL = e ¹
PFH [1/h]	3.68 x 10 ⁻⁸
MTTFd	100 years
Mission Time	20 years

Application Demand Base:

In service operation	365 days/year
Functional demand on the interlock switch	8 per day

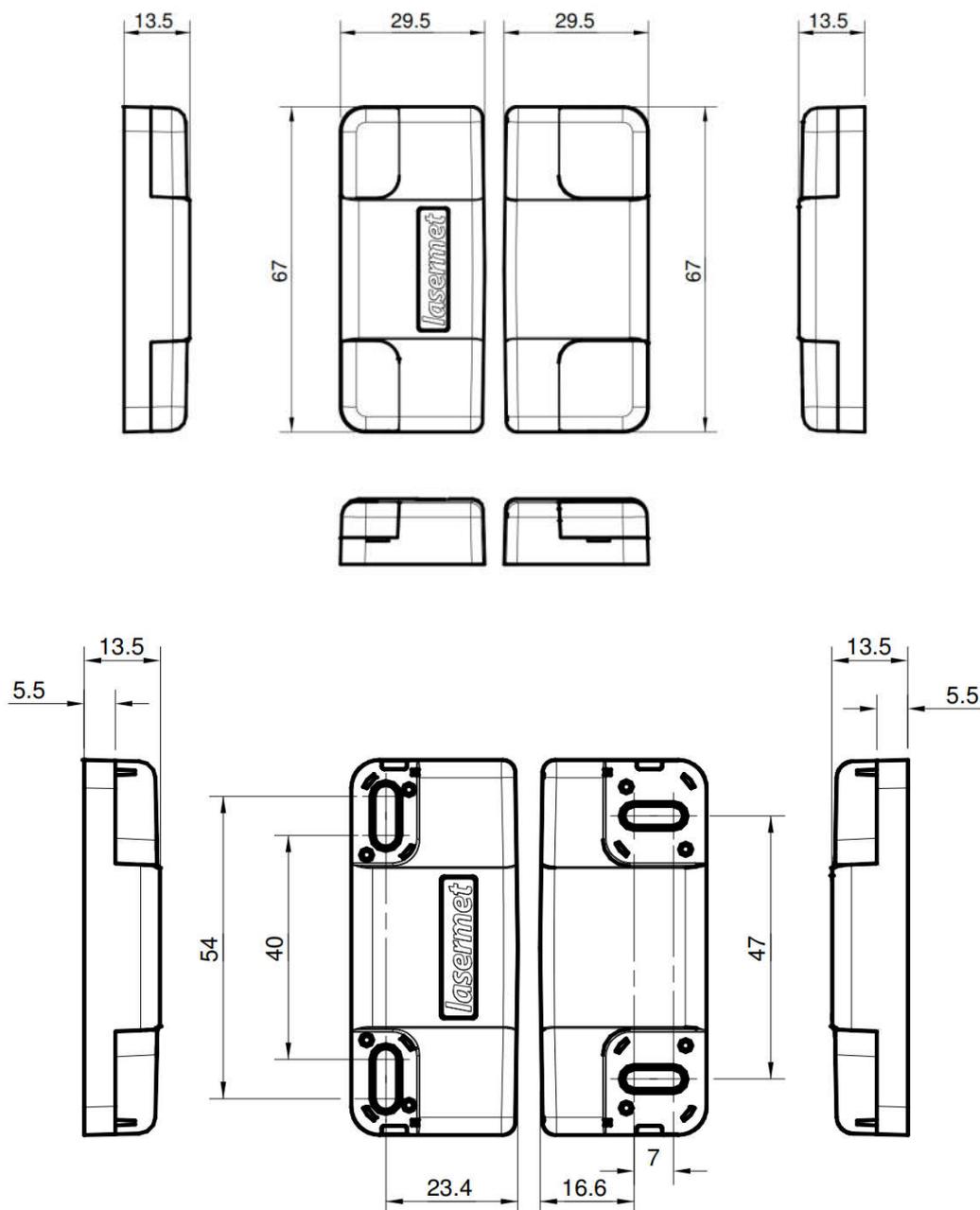
¹ The level of performance assessed is based on the typical application demand resulting from the B10d values of the internal components based on a maximum usage rate of 2920 operations per year.

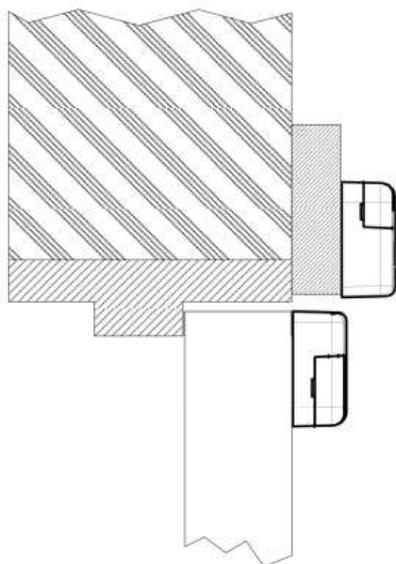
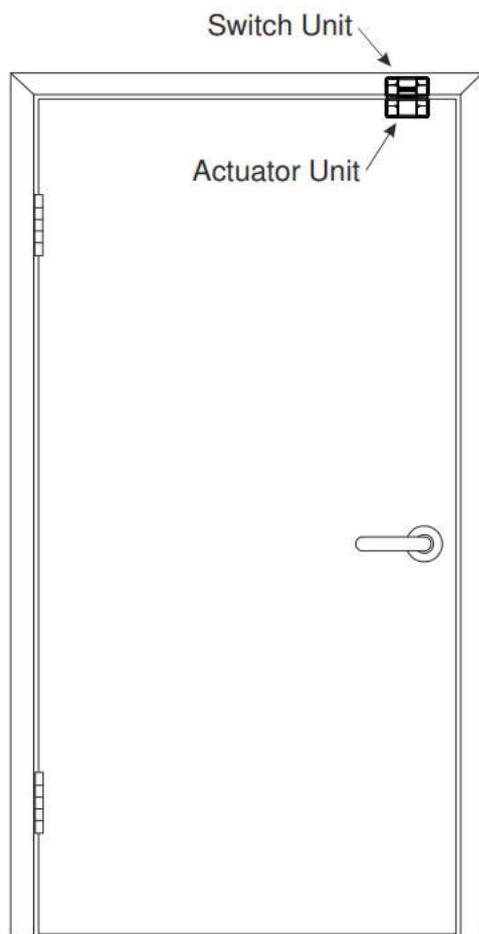
5 Installation

The Door Contact is intended for indoor benign environments. It is not suitable for use in locations exposed to rain or moisture, in areas of high humidity or corrosion. It is not certified for use in areas where an explosion hazard exists.

The Door Contact may be fitted to most door and frame materials including wood, uPVC, steel, aluminium etc.

The Door Contact comprises two parts shown below





The part with the Lasermet badge and the cable attached (known as the switch) is normally affixed to the door frame, and the other part (known as the actuator) is attached to the door. The fixing hole positions are shown above and the usual mounting arrangement on a door on the left.

It is usual to site the units close to the opening side of the door so that even a slight opening is detected. It is also usually preferable to position the units in the most inaccessible position to discourage tampering.

By default, the lead of the switch unit exits at the back. It is visually preferable if a hole can be drilled into the architrave such that the lead can be hidden out of sight. The lead may then be buried in the wall or taken into mini trunking adjacent to the architrave.

If this is not possible the side of the switch body adjacent to the lead may be carefully broken out to allow the lead to run along the surface. Take care not to damage the lead when making the breakout.

On some doors the door surround (architrave) projects forward of the door face. The IS-MDC-12 will work with the switch unit up to 8mm or more in front of the actuator unit, as shown in the figure. This may reduce or eliminate the need for cutting into the architrave.

Some experimentation using temporary means of attachment may be useful to determine the optimum position, see the section, 'Testing with a Multimeter'.

Fit the two parts to the door using the screws provided, but do not tighten the screws fully or fit the screw caps until the system has been completely tested. The two long flat sides of the units should face and be aligned with each other. The gap between the units should be in the range 1mm – 5mm.

The screw holes in the two parts are slotted to allow for adjustment and alignment. If the lead has been fed into a hole behind the switch part, the hole may need to be adjusted to allow for any repositioning of the switch. It is suggested that the screw covers are not fitted until the switch has been tested, as they may get accidentally broken if subsequently removed.

5.1 Testing Using a Multimeter

The contact can be tested for correct operation using a multimeter before it is wired to the interlock panel. To do this set the meter to the continuity buzzer mode and check that it beeps when the probes are touched together.

Next attach one probe to the red wire of the door contact and the other to the blue wire. When the door is closed the buzzer should sound. Repeat for the black and white wires.

Lastly check the green and yellow wires. With these wires the buzzer should only sound when the door is open. Check that all three pairs of contacts work correctly under all conditions of door movement. For example, with the door held shut by its catch or lock, check that the contacts work as above without interruption when the door is pushed against the jamb and pulled against its lock.

5.2 Electrical Connections

Lead Core Colours

In this manual a 'normally closed' contact is one which is made when the door is closed, and a 'normally open' contact is made when the door is open.

Red-Blue	Normally Closed Contact 1
White-Black	Normally Closed Contact 2
Yellow-Green	Normally Open Contact

Contact Rating

All three contacts in the switch are isolated from each other and rated at 50V 300mA resistive load. On no account must mains/line voltage be applied to this product.

The load current should never exceed 300mA and the switch has internal overcurrent protection which will disable it permanently should this current be exceeded. If this happens the switch should be replaced. The switch should never be opened. This will invalidate the warranty and there are no serviceable parts inside.

All Lasermet ICS panels comply with this requirement.

Wiring to a Lasermet ICS Interlock Control Panel

ICS-6

Select an unused Interlock connector J1-J4.

Connect the red wire to an A terminal.

Connect the white wire to a B terminal.

Connect the black wire to the other B terminal.

Connect the blue wire to the other A terminal.

The green and yellow wires are not used on the ICS-6.

Extending the Lead

The lead fitted to the door switch is usually not long enough to reach the control panel and will need to be extended using low voltage stranded multicore cable. Unless the cable run is exceptionally long, cable with 7/0.2mm cores are suitable. Six core cable is required unless connecting to an ICS-6, where only four cores are necessary. Lasermet can supply suitable cable to match that fitted to the switch.

5.3 Final Testing

Once the panel is fully wired the system may be tested according to the ICS instruction manual or specific instruction procedures.

The final position of the switch should be adjusted so that the system is disabled before the door or cover is sufficiently opened to present a hazard to those outside.

Once the final position of the switch and actuator have been set, they may be secured by fully tightening the screws. The screw caps should then be fitted to cover them. Note that all four caps are different, and care should be taken to fit the right ones in the right places.

6 Specifications

Contacts	2NC / 1NO
Rating	300mA Resistive Load 50V
Channels	2, dual channel
Magnet Coupling	Coded
Maximum Range	10mm typical
Safety Performance	Up to BS EN 13849-1:2008 PL 'e'
Operating Environment	-5° to +45°C, 0 – 95% RH
Environmental Protection	IP50
Switch Size	67 X 29.5 X 13.5mm
Actuator Size	67 X 29.5 X 13.5mm
Lead Length	1m approx.
Combined weight	85g approx.

Safety Performance

This product is certified to Performance Level 'e' (PLe) to EN ISO 13849-1:2015.

When connected to an interlock control system as shown in this manual, the IS-MDC-12 has the following characteristics. This can also be achieved by correctly connecting to another suitable safety control system which has dual channel monitoring of the shutdown device.

Mean time to dangerous failure (MTTF _d)	100 years
Probability of dangerous failure per hour (PFH)	3.68×10^{-8}

It is important to note that the Performance Level established for the IS-MDC-12 are those that may be achieved by the system when the board is properly integrated into a safety related part of a control system.

7 Warranty

Lasermet provide a 12-month warranty for defects in materials and manufacture, from the date of installation or delivery. Installations completed by Lasermet are covered against defects in workmanship for 12 months.

Damage or defects caused by other factors are not covered. For example, industrial contamination, incorrect cleaning, storm damage. Consequential loss is not covered under warranty. Compensation for indirect or direct loss or damage is expressly excluded. Rectification of the defects or a replacement does not initiate a new warranty period.

For all deliveries, payments and other legal transactions, English law takes precedence for any litigation.

8 Contact Details

Lasernet provide a full range of laser interlock equipment including interlock switches, illuminated warning signs, laser shutters, entry keypads with built-in fail-safe override timer, door locks, external power supplies etc. which can be interconnected to provide a complete system. We also supply equipment and consultancy covering all aspects of laser safety. Full support, design, and installation is available from Lasernet, please contact us for any queries.

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