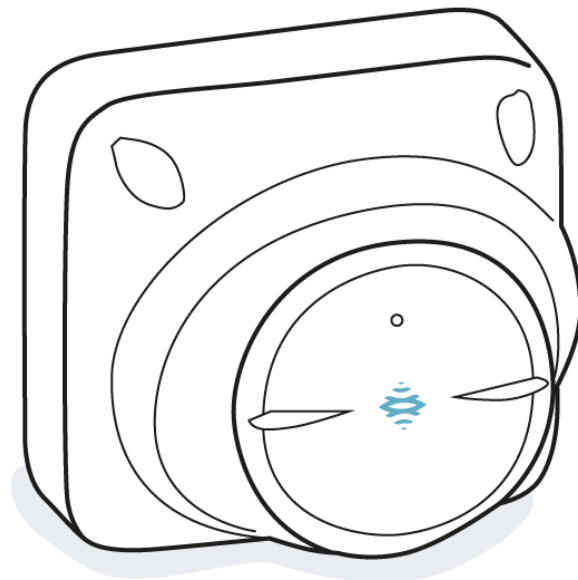




MSK-101-POE-MM

**Intelligent motion sensor
Power over Ethernet**



**Installation instructions
v1.1 - EN**

Carefully read this manual in its entirety.

You will find useful information to take full advantage of the product's potential, use it safely and obtain the best results.

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Instruction updates

Publication date	Code	Updates
DEC 2019	msk-101-poe_instructions_en_us v1.1	Modified web address for security products Added password insertion criteria
AUG 2019	msk-101-poe_instructions_en_us v1.0	First publication

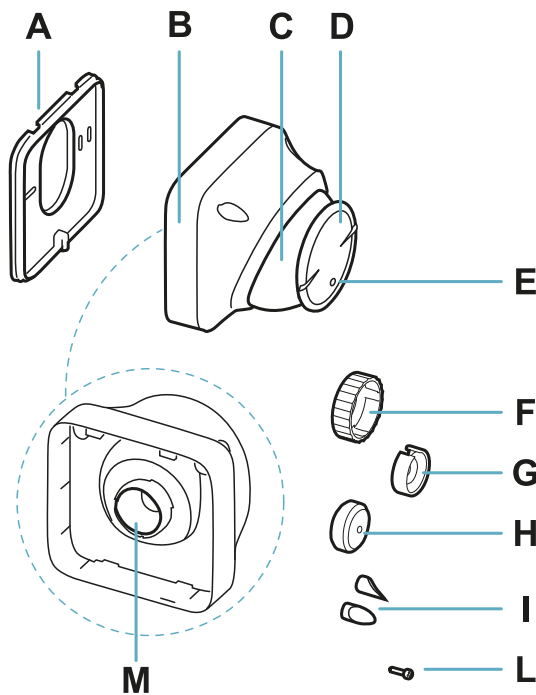
Provided documentation

Document	Code	Date	Distribution format
Installation instructions (this manual)	msk-101-poe_instructions_en_us v1.1	DEC 2019	PDF online
Advanced configuration manual	msk-101-poe-advanced-config_en_us v1.1	DEC 2019	online manual PDF online
Inxpect MSK-101-POE Rest API	msk-101-poe-RestApi	-	PDF online

1. Get to know MSK-101-POE-MM

1.1 MSK-101-POE-MM

1.1.1 Main components



Part	Description
A	Perforated back plate for adaptation to the main junction boxes ! IMPORTANT: the back plate is, together with the two fastening screws (not provided), an integral part of the sensor anti-removal and anti-tear system.
B	Sensor case
C	Adjustable support for the sensor with integrated fastening screws
D	Sensor
E	LED
F	Ferrule
G	Cable protection ring
H	Cable protector
I	Caps to cover the fastening screws of the adjustable support
L	Fastening screw for case-back plate Note: the case-back plate fastening screw is not a part of the sensor anti-removal and anti-tear system.
M	Hole for access to the Ethernet port

1.2 Configuration and communication

1.2.1 Introduction

The sensor communicates through a secure HTTPS connection that requires installation of a specific certificate. The certificate can be downloaded from the website www.inxpect.com/security/tools.

Thanks to REST type API, it is possible to read and write the configuration of the sensor and see the status.

Access to most of the operations is password protected.

1.2.2 Available information

The sensor provides the following information:

- the distance and dimension of the last detected object
- alarm signals for:
 - object detected in the alarm area
 - object detected in the pre-alarm area
 - tampering
 - masking
 - malfunction, error or failure

1.2.3 API documentation

For detailed information about the implemented APIs and to integrate them into your system, refer to the document Inxpect MSK-101-POE Rest API, which can be downloaded from the website www.inxpect.com/security/tools.

1.2.4 Web interface for configuration

The sensor can be easily configured through the integrated web interface, accessible via a web browser.

1.2.5 Access to the web interface

By default, the sensor tries to acquire a dynamic IP address through DHCP. If the operation fails, it acquires an IP through Auto IP (first attempt address: 169.254.1.50).

The web interface can be easily reached through the serial number of the sensor using protocols like NetBIOS and/or mDNS (see "Access to the web interface" on page 15). On the web interface it is possible to change the default settings, for example setting a static IP address.

1.3 Applications

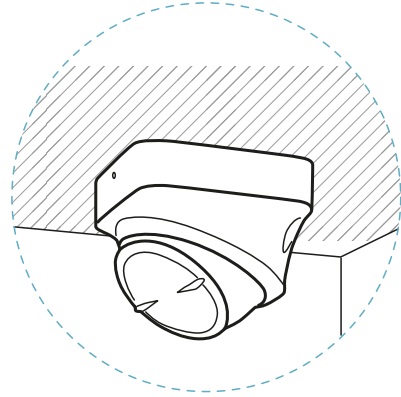
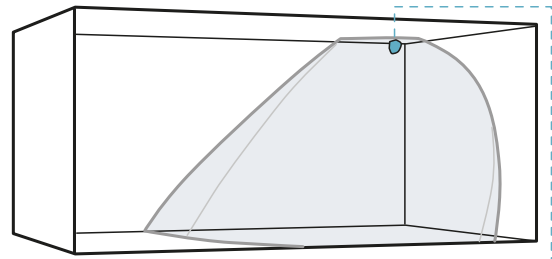
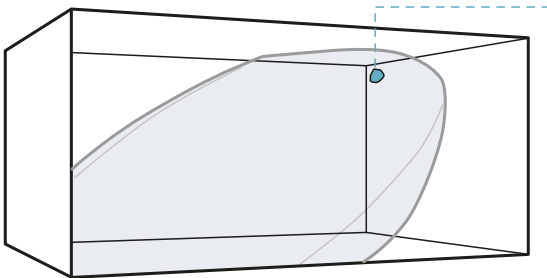
1.3.1 Types of applications

The sensor is suitable for indoor and outdoor installations and can be mounted on the wall or ceiling.

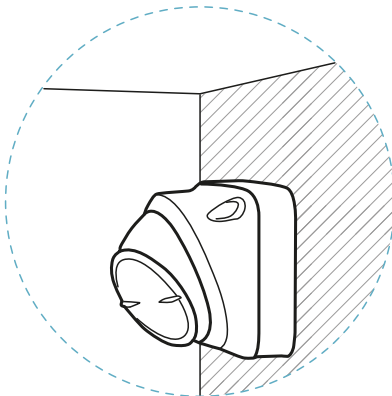
According to the direction, the sensor can be:

- a volumetric sensor to monitor a large area (horizontal direction).
- barrier sensor to monitor a perimeter area, creating a protective barrier against access along a wall or gate (vertical direction).

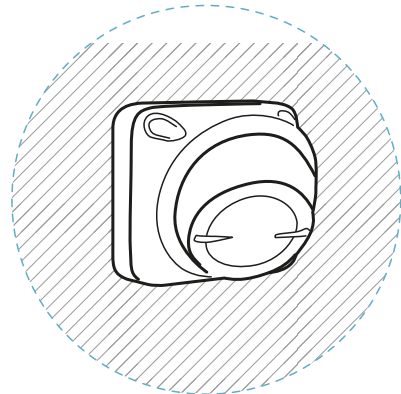
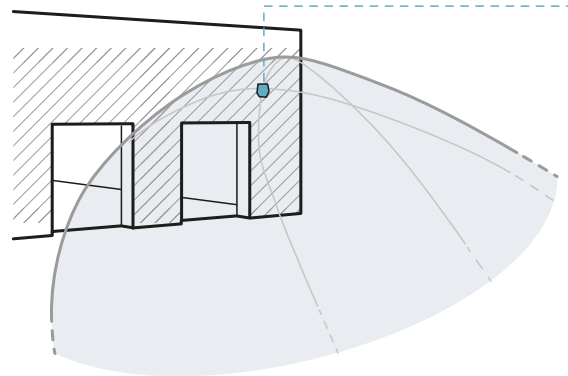
1.3.2 Examples of volumetric sensor installation



Indoor ceiling installation.

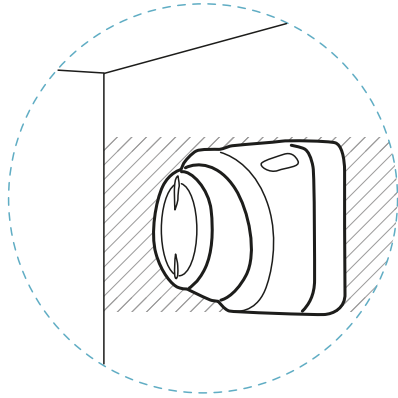
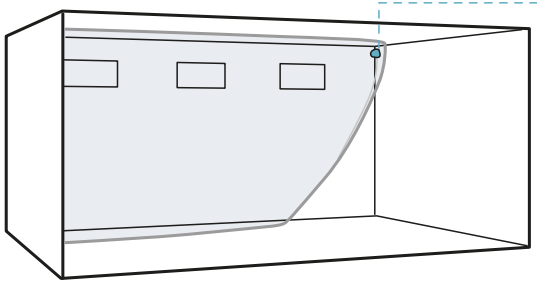


Indoor wall installation.

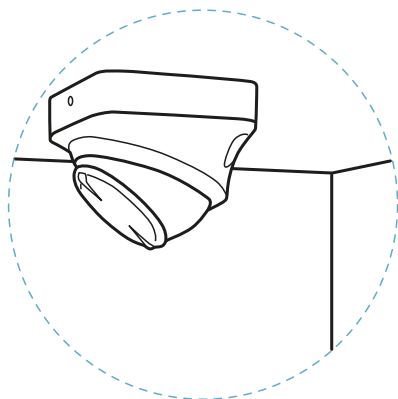
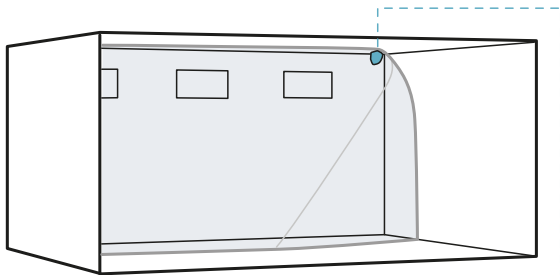


Outdoor installation.

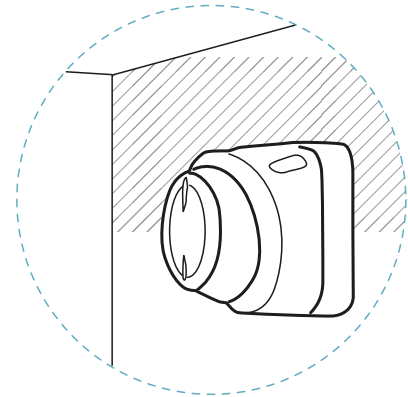
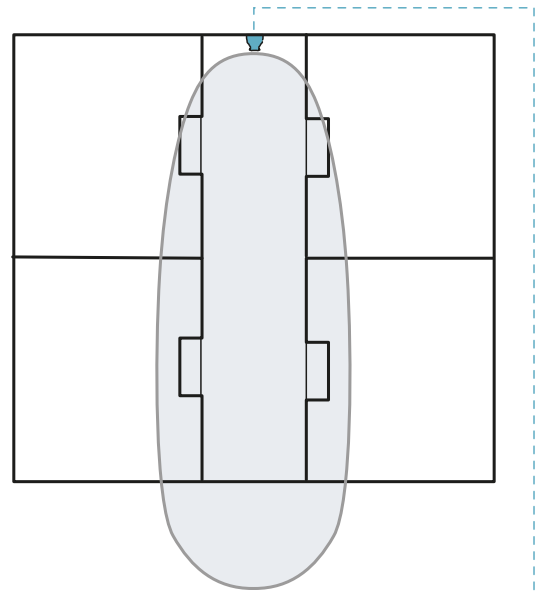
1.3.3 Examples of barrier sensor installation



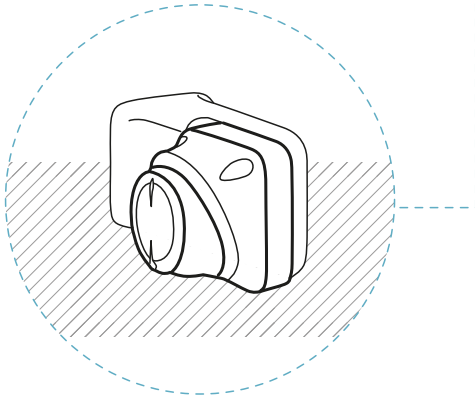
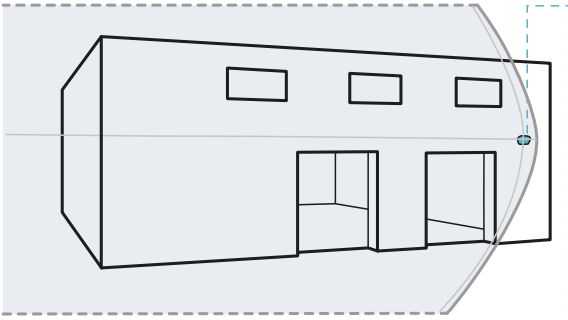
Indoor wall installation.



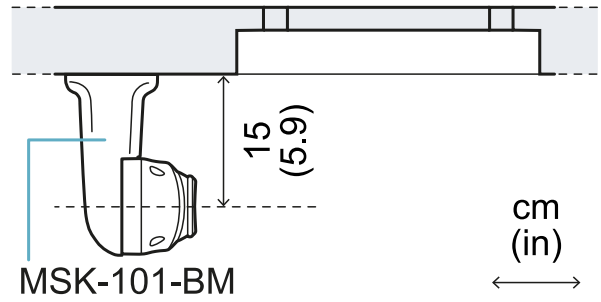
Indoor ceiling installation.



Indoor hallway installation.



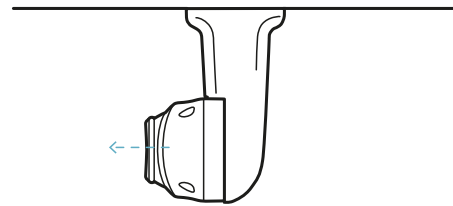
Outdoor installation with bracket.



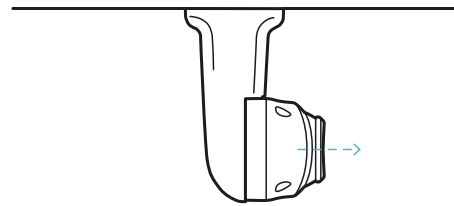
Example of installation with MSK-101-BM bracket.

1.4.2 Sensor direction

The MSK-101-BM bracket, according to the installation method, allows directing the sensor to the left or the right.



Sensor directed towards the left.

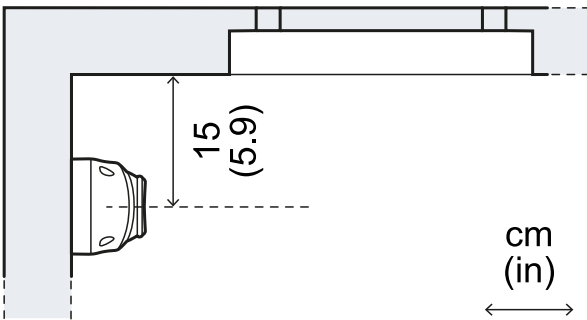


Sensor directed towards the right.

1.4 Barrier configuration

1.4.1 Barrier bracket

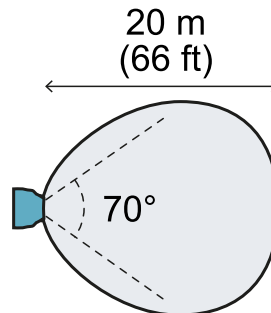
Barrier installation for safeguarding a wall or window requires the sensor to be installed at approximately 15 cm (5.9 in) from the same wall. If other adequate supports are not available, use the barrier bracket (product code: MSK-101-BM).



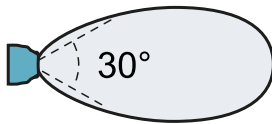
Example of installation with bracket.

1.5 Field of vision

1.5.1 Range of the field with horizontal sensor direction (volumetric)

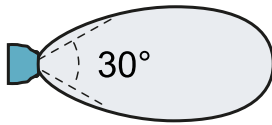
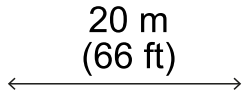


Top view.

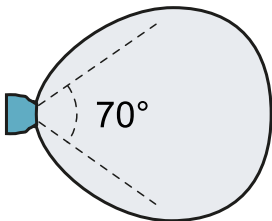


Side view.

1.5.2 Range of the field with vertical sensor direction (barrier)

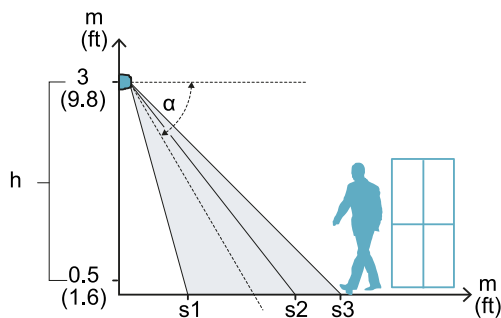


Top view.



Side view.

1.5.3 Calculation of the field of vision



The actual field of vision of the sensor (detection start and end, s_1 and s_3) depends on:

- sensor installation height (h)
- sensor direction (horizontal or vertical)
- sensor inclination (α)

Within the field of vision, discernment of animals is guaranteed up to a certain distance from the sensor (s_2). For details about discerning animals, refer to the advanced configuration manual.

Based on a specific installation height, there are direction and inclination combinations that guarantee optimum performance. Some examples to better explain the effects of height and inclination are presented as follows.

1.5.4 Examples of the field of vision with horizontal sensor direction (volumetric)

NOTICE: the detection start and end values do not guarantee detection of a standing person. The reported values may slightly vary based on the installation conditions.

Note: only some heights are reported, but every intermediate value is allowed and guarantees optimum performance.

The dimensions of the field of vision expressed in meters and feet are as follows.

h (m)	α (°)	s_1 (m)	s_2 (m)	s_3 (m)
1	0	0.5	*	20
1.5	0	0.5	20	20
2	-15	2.5	16	16
2	-30	2	7.5	10
2.5	-15	3	17	17
2.5	-30	2.5	7	10
2.5	-45	2	6.5	6.5
3	-30	2.5	7	10
3	-45	2	4.5	6.5

h (ft)	α (°)	s_1 (ft)	s_2 (ft)	s_3 (ft)
3.2	0	1.6	*	65
4.9	0	1.6	65	65
6.5	-15	8.2	52	52
6.5	-30	6.5	25	32
8.2	-15	9.8	55	55
8.2	-30	8.2	23	32
8.2	-45	6.5	21	21
10	-30	8.2	23	32
10	-45	6.5	15	21

Note *: discernment of animals is not guaranteed in the entire field of vision.

1.5.5 Examples of the field of vision with vertical sensor direction (barrier)

NOTICE: the detection start and end values do not guarantee detection of a standing person. The reported values may slightly vary based on the installation conditions.

Note: only some heights are reported, but every intermediate value is allowed and guarantees optimum performance.

The dimensions of the field of vision expressed in meters and feet are as follows.

h (m)	α (°)	s ₁ (m)	s ₂ (m)	s ₃ (m)
1	0	0.5	*	20
1.5	0	0.5	20	20
2	-15	2	20	20
2	-30	1	16	16
2.5	-15	2	20	20
2.5	-30	1	20	20
2.5	-45	1	16	18
3	-15	2	20	20
3	-30	1	20	20
3	-45	1	12	15

h (ft)	α (°)	s ₁ (ft)	s ₂ (ft)	s ₃ (ft)
3.2	0	1.6	*	65
4.9	0	1.6	20	65
6.5	-15	6.5	20	65
6.5	-30	3.2	16	52
8.2	-15	6.5	20	65
8.2	-30	3.2	20	65
8.2	-45	3.2	16	59
10	-15	6.5	20	65
10	-30	3.2	20	65
10	-45	3.2	12	49

Note *: discernment of animals is not guaranteed in the entire field of vision.

1.6 Interferences

1.6.1 Introduction

The MSK-101-POE-MM sensor is different from other traditional motion sensors. It is important to know what factors interfere in its correct functioning, to properly install, configure it, and to obtain optimum performance; for detailed information see Advanced configuration manual.

1.6.2 Interference with neon tubes

In the presence of neon tubes, respect the minimum sensor inclination indicated so that the tube does not interfere with the sensor:

Sensor direction	Minimum inclination (α)*
Horizontal	- 15°
Vertical	- 30°

Note *: see "Examples of the field of vision with horizontal sensor direction (volumetric)" on the previous page and "Examples of the field of vision with vertical sensor direction (barrier)" on the previous page.

1.6.3 Interfering materials

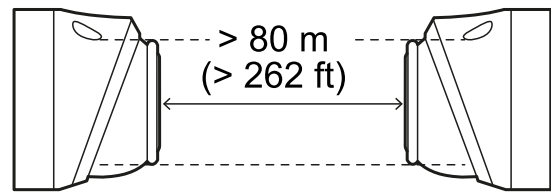
Below is a list of materials that could impact the sensor performance if they hide it:

- surfaces having metal-based paints or carbon-based paints
- tinted windows
- surfaces having EMI/RFI glasses or mirrors
- surfaces with water pipes, cables
- tiles having metal-based glaze including blue cobalt
- metal screen foil
- foil-backed insulation materials (e.g. foil)
- foil moist materials (e.g. cork)

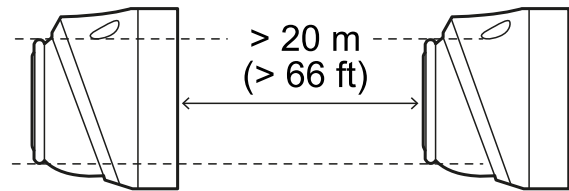
1.6.4 How to install several sensors

Three possible combinations of sensor installation and the minimum distances to maintain between the sensors with the sensors aligned are presented as follows. Respecting these distances guarantees the performance levels indicated in section "Field of vision" on page 8.

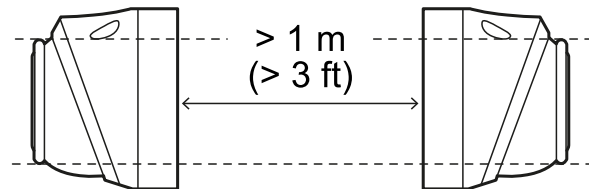
NOTICE: other combinations are possible, but their performance must be validated in the field.



Front-front combination



Front-back combination



Back-back combination

Note: the blind spot created in this combination is very wide. If possible, use the front-back configuration.

2. Installation and use

2.1 Before installation

2.1.1 Necessary components and tools

- A computer connected to the same network as the sensor.
- Only for barrier applications and if necessary, bracket for assembly (product code: MSK-101-BM), see "Barrier configuration" on page 8.
- Two screws up to M4 (No. 6) 30 mm long (1.9 in) for fastening to the wall or to the junction box.
- Screwdriver and fastening tools not provided.

2.1.2 Prepare for installation

NOTICE: to ensure effective functioning, the sensor must be installed in the best possible position and configured correctly. Carefully follow the instructions below.

Before installing the sensor, perform the following operations:

1. Define the sensor application type (see "Applications" on page 6).
2. Define the installation position, considering possible interferences (see "Interferences" on page 10).
3. Define the height of installation for the sensor to obtain the desired field of vision (see "Field of vision" on page 8).
4. Run a cable without terminal from the Ethernet network in question.

NOTICE: installation with cable that already has a terminal is possible but not recommended.

5. Download the security certificate from the www.inxpect.com/security/tools website to access the configuration web interface and install it.
6. Only for installations with MSK-101-BM bracket, define the direction of the sensor (see "Barrier configuration" on page 8).

2.1.3 Warnings

NOTICE: harm to the device. Do not let dust or water near the sensor during installation.

2.1.4 Install MSK-101-POE-MM

1. Assemble the sensor:

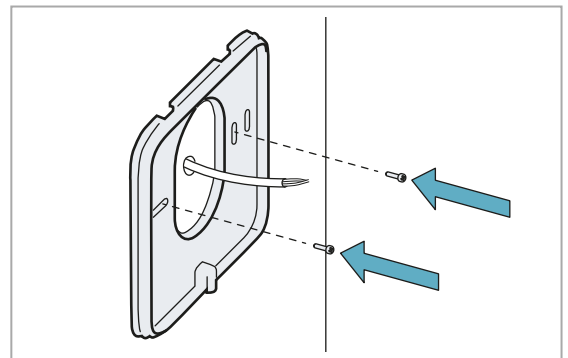
For...	See...
barrier applications with MSK-101-BM bracket and sensor directed to the right	"Assemble the sensor with the MSK-101-BM bracket (sensor directed to the right)" on page 13
barrier applications with MSK-101-BM bracket and sensor directed to the left	"Assemble the sensor with the MSK-101-BM bracket (sensor directed to the left)" on page 14
all other cases	"Assemble the sensor" below

2. "Direct the sensor" on page 15.
3. "Access to the web interface" on page 15.
4. "Fasten the sensor" on page 15.

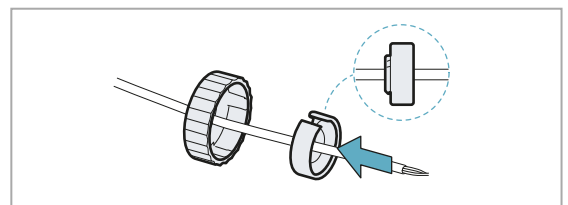
2.2 Install and configure the sensor

2.2.1 Assemble the sensor

1. Using the prepared holes, fasten the plate to the wall or to the junction box with two screws (not provided). See "Back plate dimensions" on page 20.

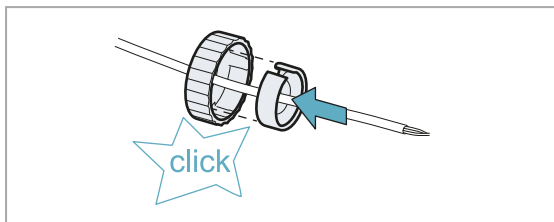


2. Insert the ferrule in the cable and then the cable protection ring.

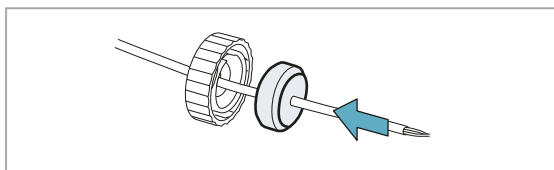


2. Installation and use

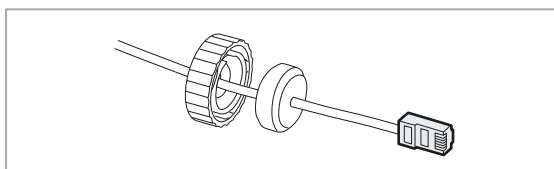
- 3. Insert the cable protection ring into the ferrule until it clicks.



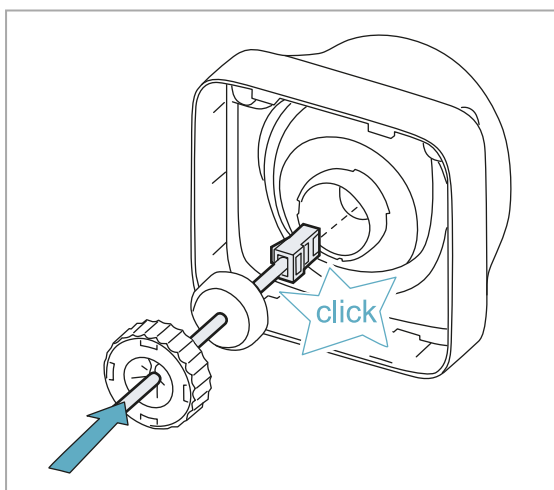
- 4. Insert the cable protector in the cable. If the cable already has a terminal, see "Procedure with cable already with terminal" on the facing page.



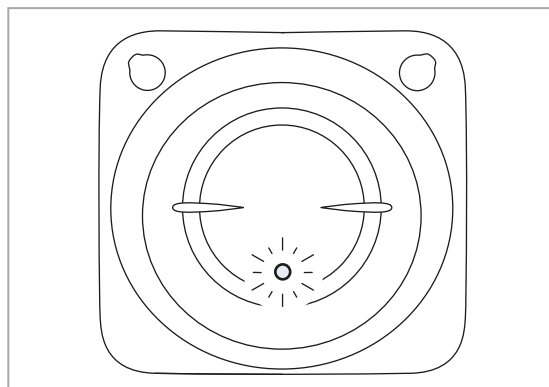
- 5. Terminate the cable using an RJ45 connector.



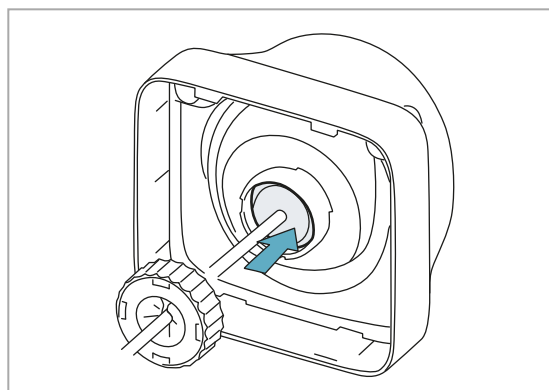
- 6. Insert the RJ45 connector into the Ethernet port through the hole on the back of the sensor until it clicks.



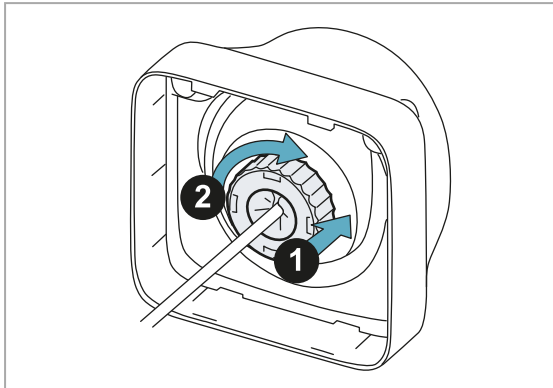
- 7. If the sensor is already supplied with power, check that the LED on the sensor is flashing blue.



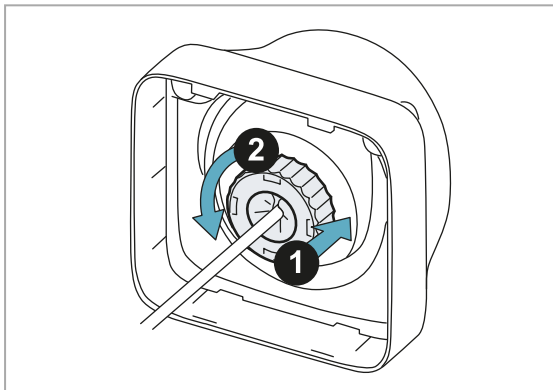
- 8. Insert the cable protector into the hole on the back of the sensor and press it until it is entirely housed in the housing.



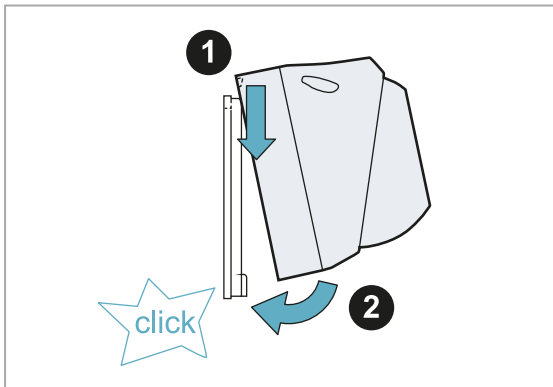
9. Push the ferrule all the way in and then screw it in.



NOTICE: if it is necessary to unscrew the ferrule, to prevent damaging the closure mechanism, press and then turn the ferrule in a counter-clockwise direction.

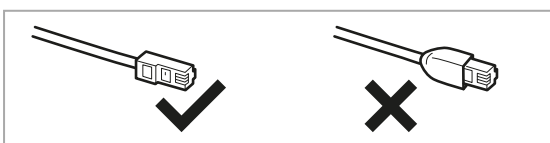


10. Fasten the sensor case to the plate.

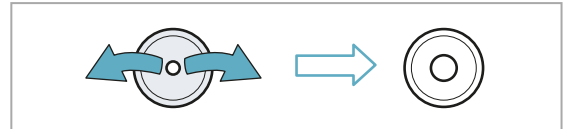


2.2.2 Procedure with cable already with terminal

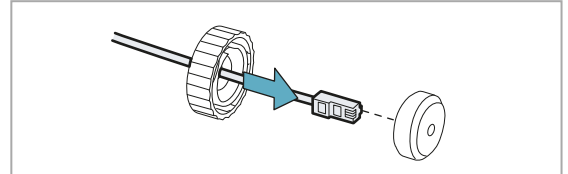
Note: this procedure is possible only if the cable already has a terminal with a non-industrial RJ45 connector.



1. Expand the cable protector using your hands, pulling it right and left to enlarge the hole.

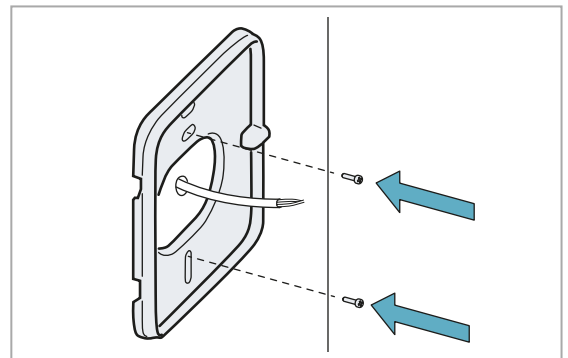


2. Insert the cable in the cable protector by pressing firmly.

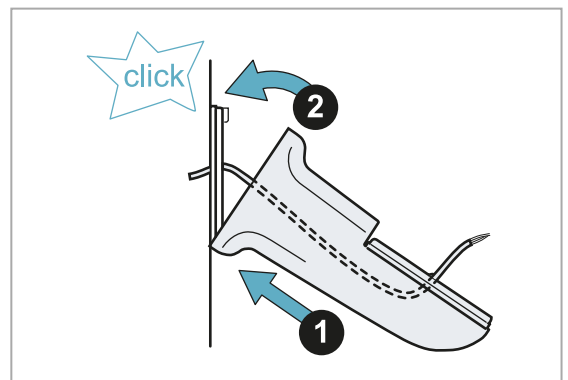


2.2.3 Assemble the sensor with the MSK-101-BM bracket (sensor directed to the right)

1. Using the prepared holes, direct the sensor plate as shown in the figure and fasten it to the wall or to the junction box with two screws (not provided). See "Back plate dimensions" on page 20.

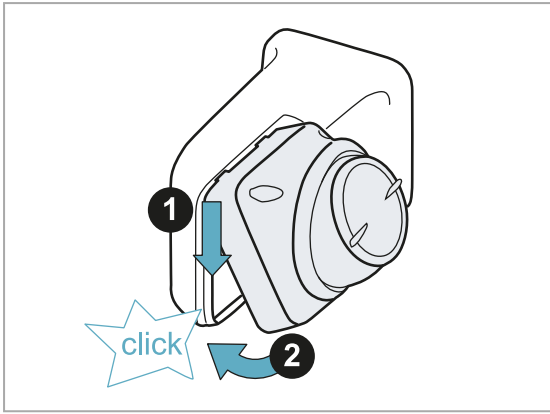


2. Fasten the bracket to the plate, passing the Ethernet cable into the bracket.

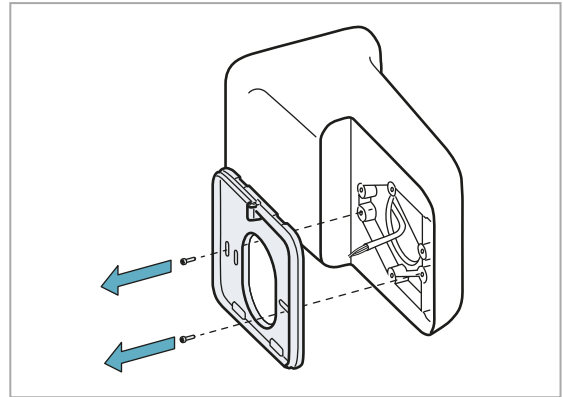


3. Insert the ferrule, the cable protection ring and the cable protector in the cable and insert the RJ45 connector into the Ethernet port, see steps 2–9 of the "Assemble the sensor" on page 11 procedure.

4. Fasten the sensor case to the bracket.

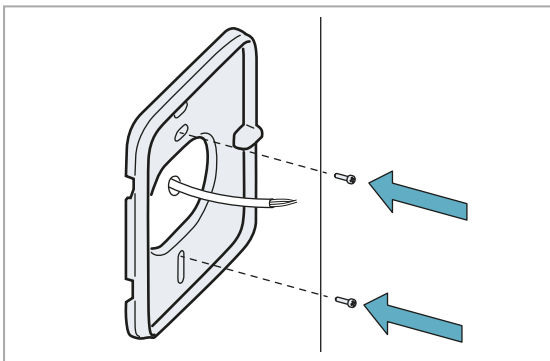


3. Unscrew the fastening screws on the pre-assembled plate of the bracket.

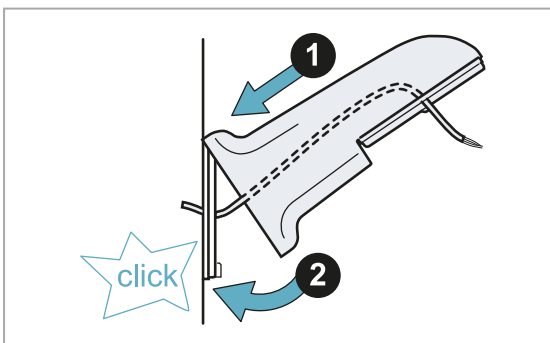


2.2.4 Assemble the sensor with the MSK-101-BM bracket (sensor directed to the left)

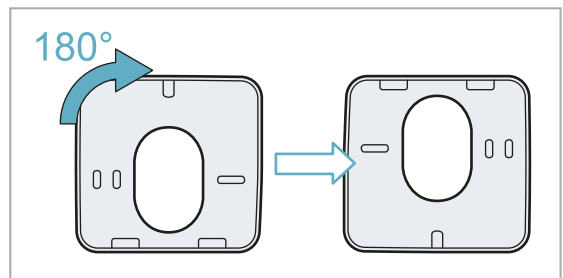
1. Using the prepared holes, direct the sensor plate as shown in the figure and fasten it to the wall or to the junction box with two screws (not provided). See "Back plate dimensions" on page 20.



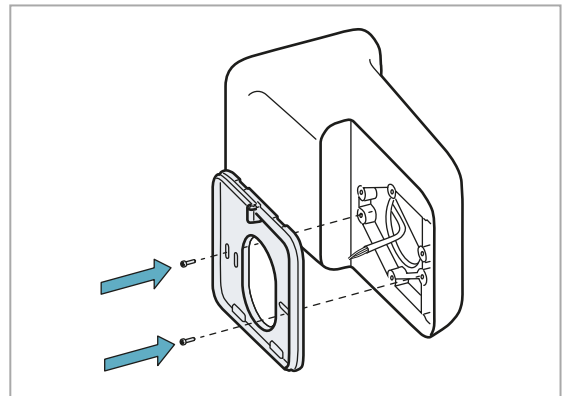
2. Fasten the bracket to the plate, passing the Ethernet cable into the bracket.



4. Turn the plate 180°.



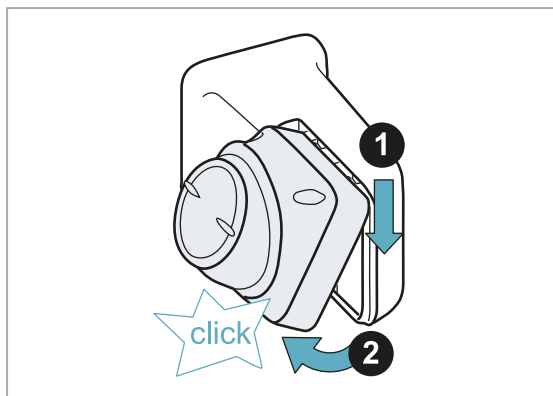
5. Tighten the screws.



6. Pass the cable into the sensor case.

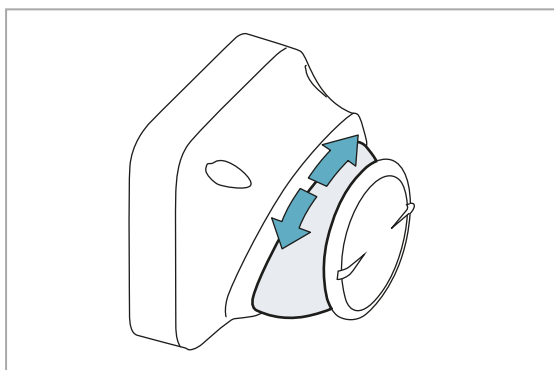
7. Insert the ferrule, the cable protection ring and the cable protector in the cable and insert the RJ45 connector into the Ethernet port, see steps 2–9 of the "Assemble the sensor" on page 11 procedure.

- Fasten the sensor case to the bracket.

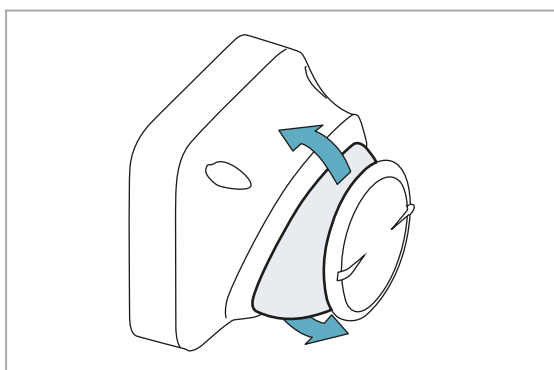


2.2.5 Direct the sensor

- Turn the adjustable support to orient the sensor direction vertically (barrier application) or horizontally (volumetric application).



- Tilt down the adjustable support to reach the desired sensor inclination.



2.2.6 Access to the web interface

- Check that the computer being used is connected to the network where the sensor is located.
- Open a web browser.
Note: to check the compatibility of the browser with the web interface, visit the www.inxpect.com/security/tools website.
- Insert the following address into the address bar:

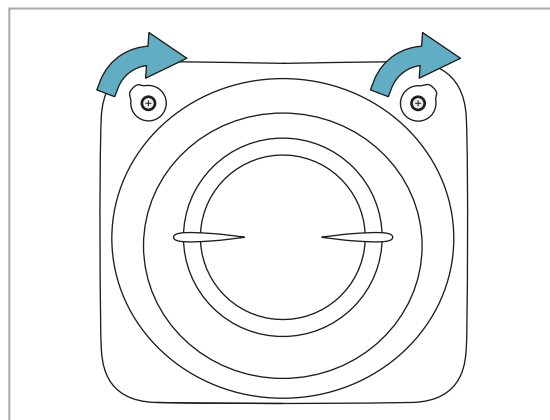
If using...	Then type...
Windows via NetBIOS	<code>https://msk101poe-xxxxx</code>
OSX/Windows via mDNS/Bonjour	<code>https://msk101poe-xxxxx.local</code>

where "xxxxx" stands for the network (NID) reported on the label on the case of the sensor.

- On the authentication page, insert the password (default "admin") and then select **ENTER**: the first step of the first start-up procedure appears.
- If required, set a new password.
Note: the password must contain at least 8 characters, of which at least one number, one capital letter and one special character.
- "Install and configure the sensor" on page 11.

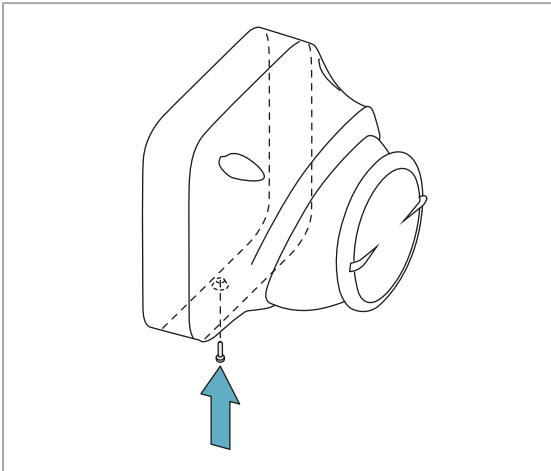
2.2.7 Fasten the sensor

- Tighten the screws to fasten the adjustable support. Check in the web interface that the adjustable support has not moved.

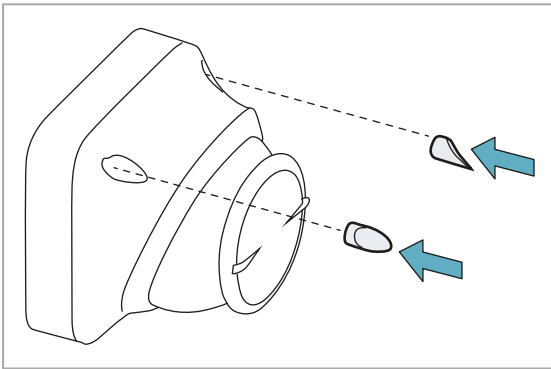


2. Installation and use

2. Fasten the case of the sensor to the plate using the provided screw.




3. Insert the provided caps.



3. Appendix

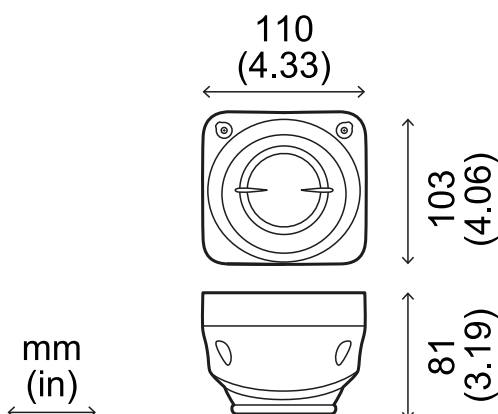
3.1 Technical data

3.1.1 General specifications

Detection method	Inxpect motion detection motor based on FMCW radar
Frequency	Working band: 24–24.25 GHz Transmission power: ≤ 13 dBm Modulation: FMCW
Detection interval	0.5–20 m (2–66 ft), depending on the installation conditions. Configurable in 30 cm (1 ft) increments.
Field of vision	Sensor horizontal plane: 90° Sensor vertical plane: 30° Height: 0.5–3 m (1.6–10 ft)
Detection speed	> 0.05 ms (2 in/s)
Power supply	Power over Ethernet, standard IEEE 802.3at, with 48 V dc (37–57 V dc) at powered device
Absorption	50 mA @48 V dc
Cable	Ethernet CAT5
Dimensions	103 x 110 x 81 mm (4.06 x 4.33 x 3.19 in)
Material	Technopolymer
Operating temperature	From -40 to +70 °C (from -40 to +158 °F)
Degree of protection	IP66 and IP67
Cable diameter	4–7 mm (0.16–0.27 in)
Approvals	 Contains FCC ID: UXS-SMR-3X4

Note:** these instructions are sufficient for meeting the requirements of standard UL639. Installations not consistent with these instructions could also comply with the standard.

3.1.2 MSK-101-POE-MM dimensions



3.1.3 Back plate dimensions

See "Back plate dimensions" on page 20.

3.2 Disposal



MSK-101-POE-MM contains electrical parts. As set forth in European Directive 2012/19/EU, do not dispose of the product with unsorted urban waste materials.

It is the responsibility of the owner to dispose of these products, as well as other electrical and electronic equipment, through specific waste collection facilities indicated by the government or local public authorities.

Correct disposal and recycling will contribute to the prevention of potentially harmful consequences to the environment and human health.

To receive more detailed information about disposal, contact the relevant public authorities, waste disposal services or the representative from whom you purchased the product.

3.3 Conformity and restrictions

3.3.1 Declaration of conformity and certifications

The manufacturer, Inxpect SpA, declares that the type of radio equipment MSK-101-POE-MM complies with the directive 2014/53/EU. The full EU declaration of conformity text is available on the company's website at the address: www.inxpect.com/security/tools.

At the same address all updated certifications are available for download.

3.3.2 FCC Certification

MSK-101-POE-MM complies with FCC CFR title 47, part 15, subpart B. It contains FCC ID: UXS-SMR-3X4.

Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation


NOTICE: changes or modifications made to this equipment and not explicitly approved by Inxpect SpA may void the FCC authorization to operate this equipment.

3.3.3 National restrictions


MSK-101-POE-MM is a short range device in class 2 in accordance with the directive 2014/53/EU (RED - Radio equipment) and is subject to the following restrictions:

	FR	UK
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Restrictions in UK. In the United Kingdom, the national allocation of frequencies does not allow the free use of the whole band 24-24.25 GHz. Set the country correctly in the Inxpect Security application and the authorized band will be automatically selected.

 **IMPORTANT:** *the sensor firmware must be version 21xx or later.*

Restrictions en FR. En France, la répartition nationale des fréquences ne permet pas l'utilisation libre de la totalité de la bande 24-24,25 GHz. Définissez correctement le pays dans l'application Inxpect Security et la bande autorisée sera automatiquement sélectionnée.

 **IMPORTANT :** *la version du firmware du détecteur doit être 21xx ou supérieure.*

3.4.3 Warranty

To find out about the terms of the warranty, exclusions and cancellation of the warranty, refer to the website www.tsec.it.

3.4 Service and warranty

3.4.1 Customer service

MAGNASPHERE Corp.
 N22 W22931 Nancys Ct., Ste 3
 Waukesha, WI 53186USA
 Tel: (262) 347-0711
 Fax: 262.347.0710
 e-mail: info@magnasphere.com
 website: www.magnasphere.com

3.4.2 How to return the product

If necessary, **pay to ship the product in its original packaging** to the area distributor, or directly to the exclusive distributor.

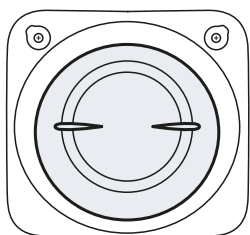
Area distributor	Exclusive distributor for North America
<i>Note distributor information here:</i>	MAGNASPHERE Corp. N22 W22931 Nancys Ct., Ste 3 Waukesha, WI 53186USA T. (262) 347-0711 F. 262.347.0710 info@magnasphere.com www.magnasphere.com

3.5 Useful conventions for requesting assistance

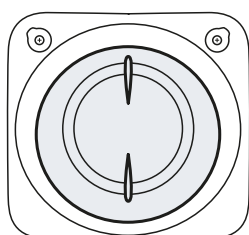
3.5.1 Conventions

Some useful conventions to communicate with Inxpect SpA technical assistance are provided below.

3.5.2 Type of application



Volumetric

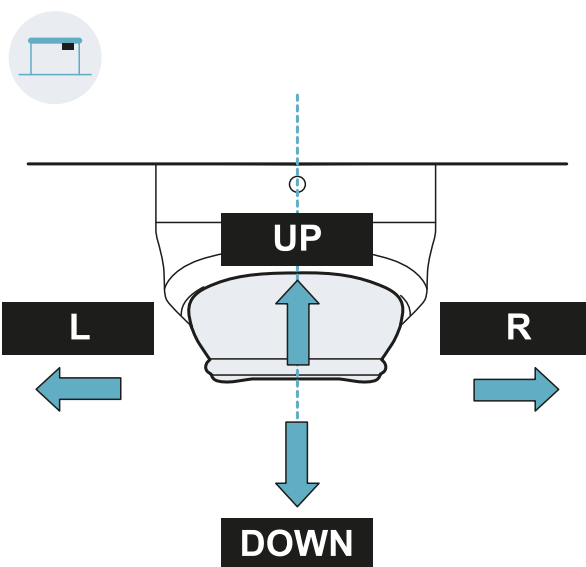
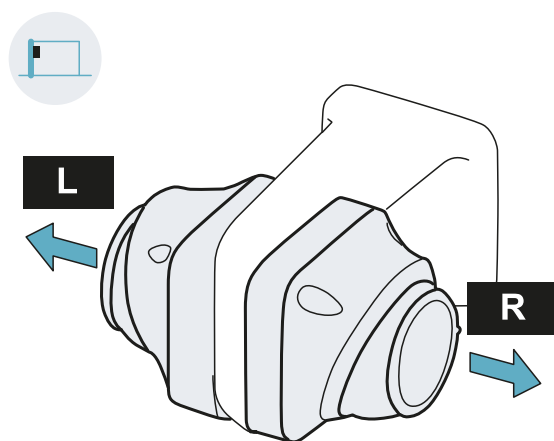
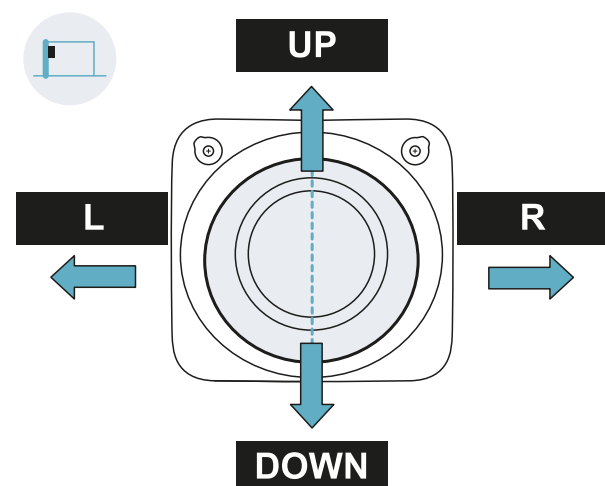


Barrier

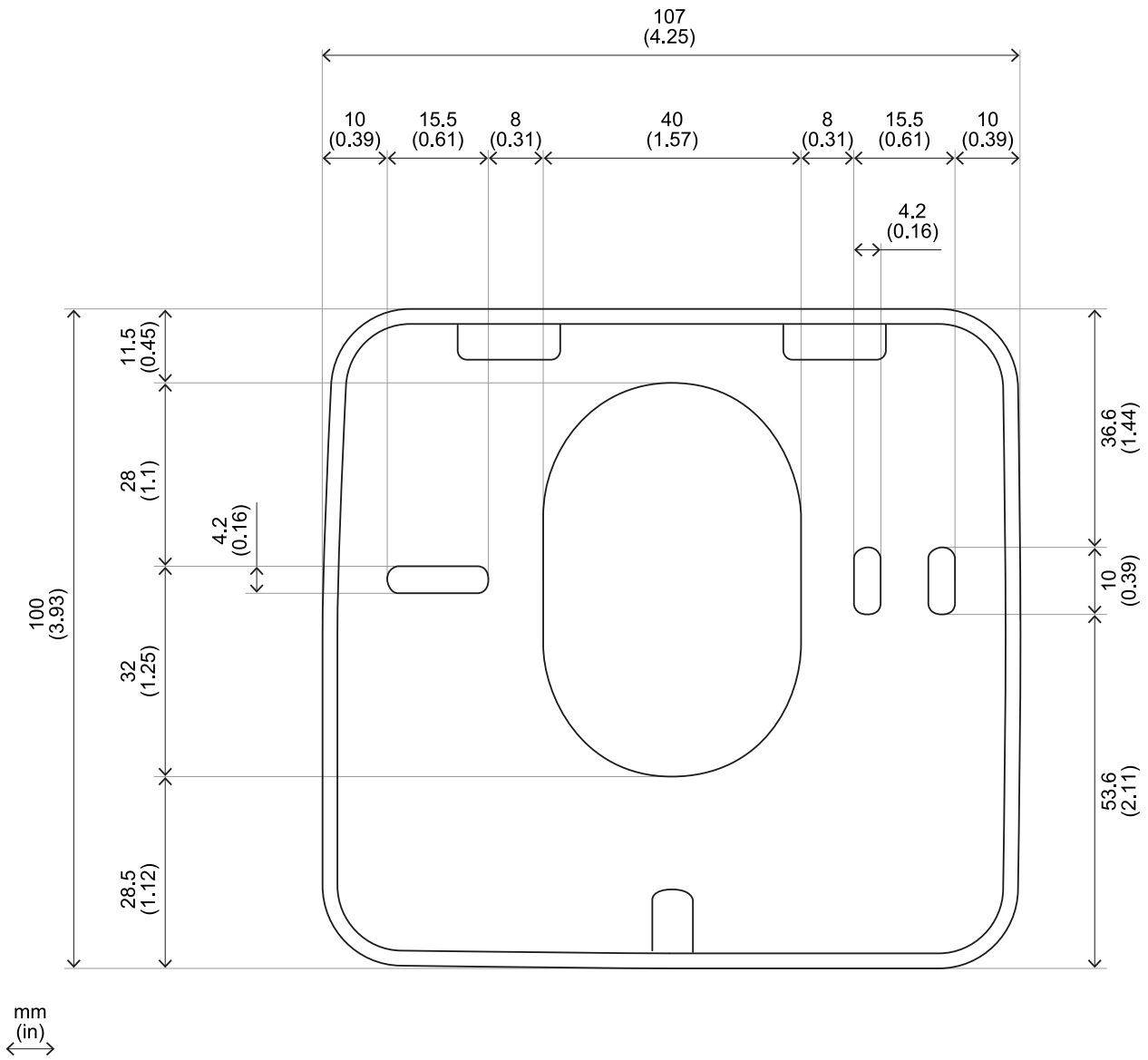
3.5.3 Spatial direction

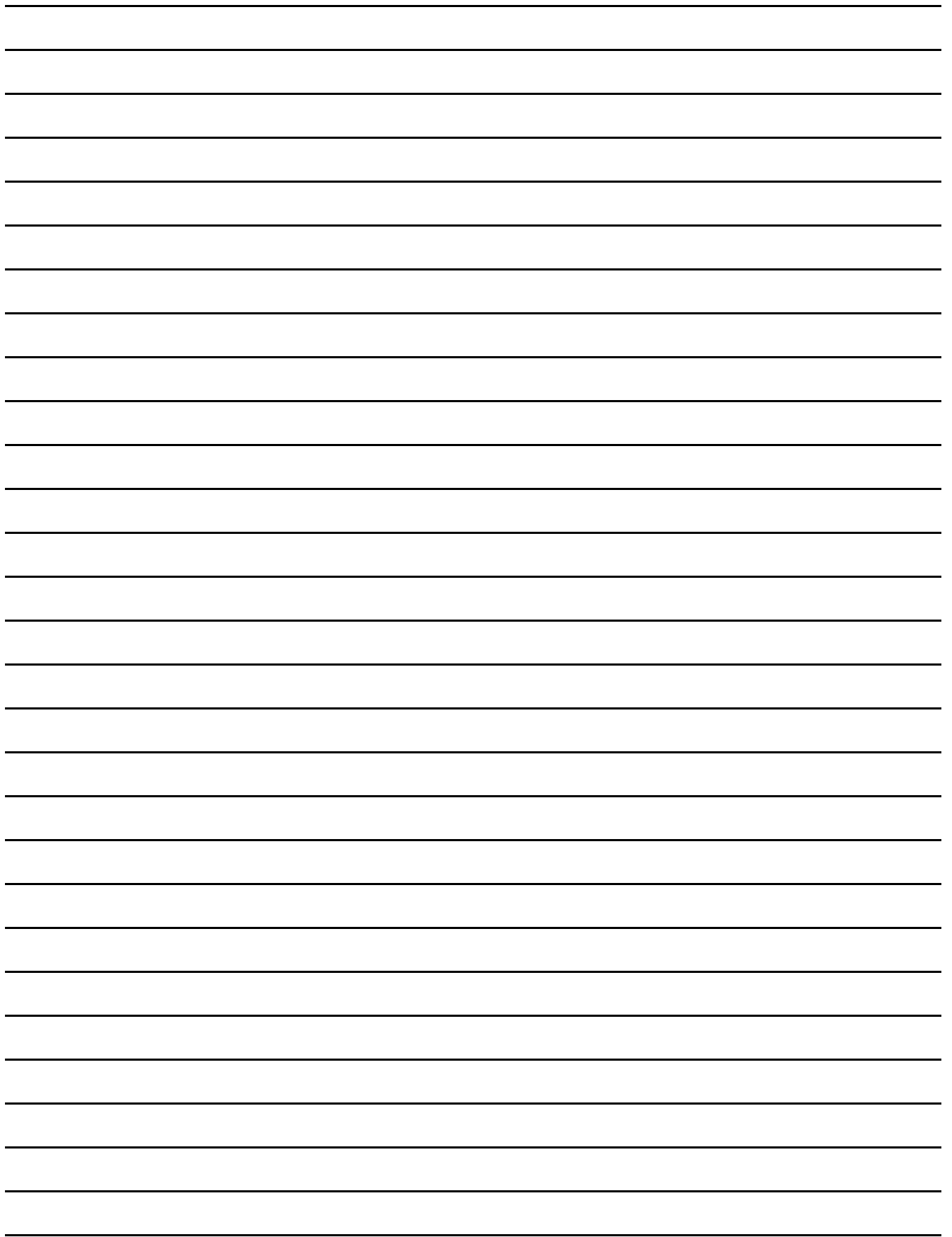
Legend

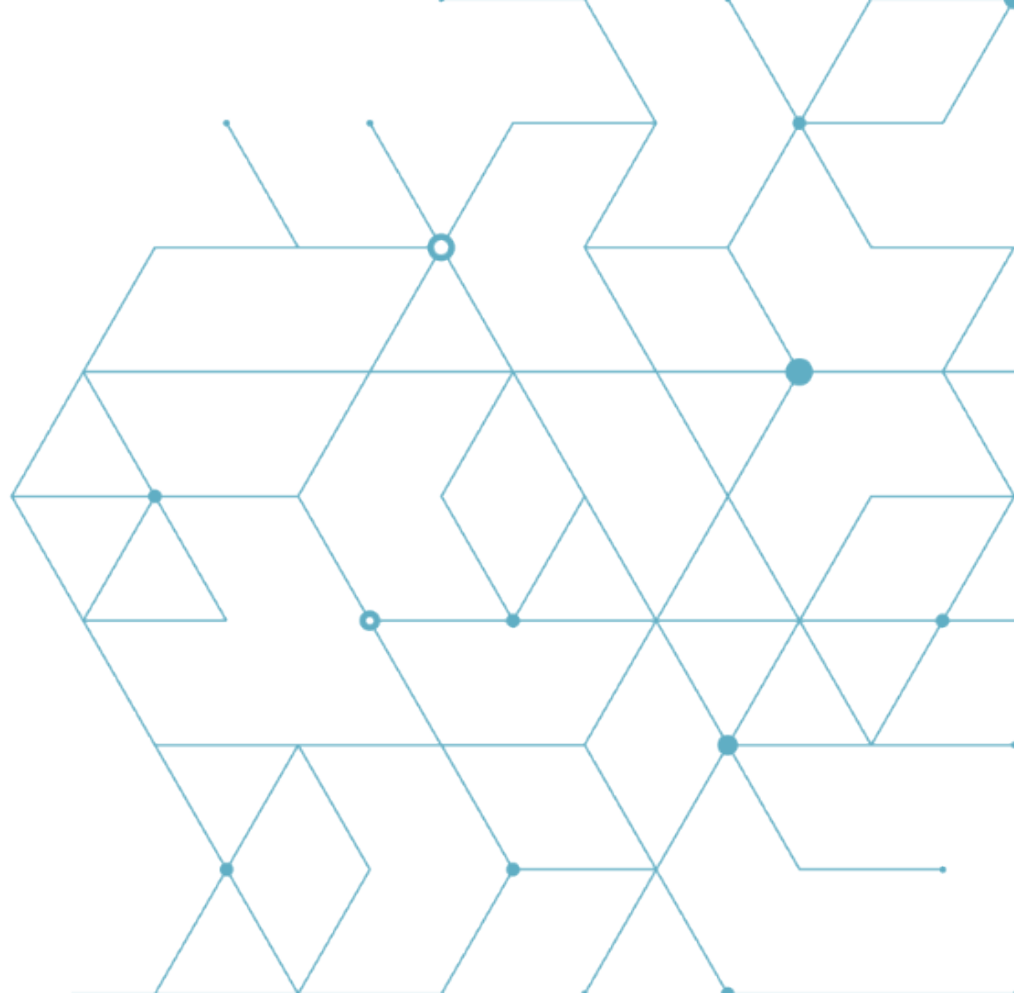
Icon	Description
	Wall installation
	Ceiling installation



3.6 Back plate dimensions







Distributor:
MAGNASPHERE Corp.
N22 W22931 Nancys Ct., Ste 3,
Waukesha, WI 53186 USA
www.magnasphere.com
info@magnasphere.com
(262) 347-0711

MSK-101-POE-MM
Installation instructions v1.1
DEC 2019
msk-101-poe_instructions_en_us v1.1
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