LENS COVERS – RANGE ADJUSTMENT FOR EOSC AND EPAC

10 November 2026



Observe precautions! Electrostatic sensitive devices!

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1 Introduction

EOSC is a ceiling-mounted occupancy sensor and EPAC is a people activity counter. Both sensors use a PIR (passive infrared) element to detect the movement of people.

This application note describes how the detection range of EOSC and EPAC can be adapted for an application. The detection range depends on the mounting height and can be reduced or shaped with an optional lens cover. This document lists typical detection diameters for different mounting heights and lens covers and explains how the lens covers are produced and mounted.

1.1 References

[1] EnOcean, EOSC Ceiling Mounted Occupancy Sensor, User Manual, https://www.enocean.com/en/product/ceiling-mounted-occupancy-sensor-eosc-oem

[2] EnOcean, EPAC EnOcean People Activity Counter, User Manual, https://www.enocean.com/en/product/enocean-people-activity-counter-epac

2 Basic Principle

EOSC and EPAC contain a PIR element and a Fresnel lens. The Fresnel lens focuses infrared light onto the PIR element. The PIR element detects the movement of heat sources, for example human bodies.

The detection range depends on the mounting height. It can be reduced further with an optional lens cover, as shown in Figure 1.

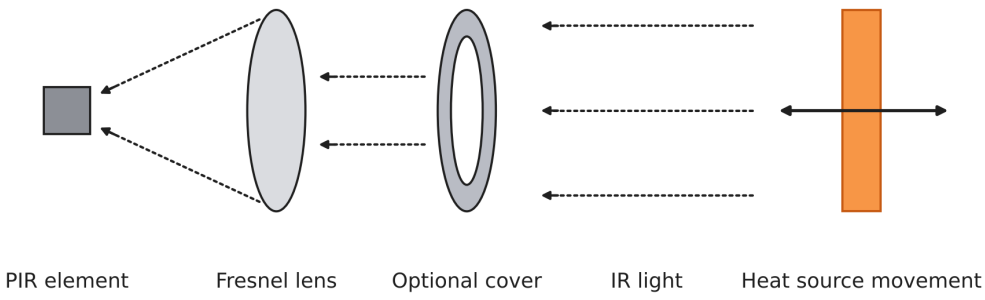
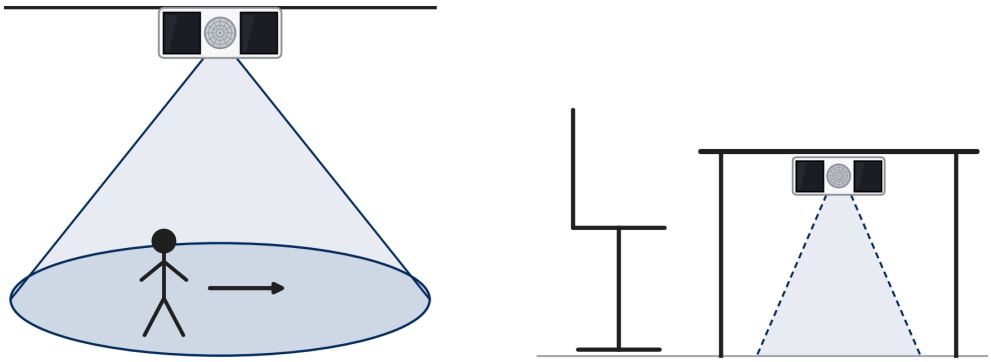


Figure 1 Basic principle of PIR detection with an optional lens cover

3 Use Cases

EOSC and EPAC are solar-powered sensors designed for ceiling mounting. At a typical mounting height of 3 m (10 ft), the sensor has a round detection area with a diameter of approximately 10 m (33 ft). For details, refer to [1] and [2].

EOSC can also be mounted under a desk to detect the presence of a person at a workplace. The light level under a desk is usually low. In this case, an optional CR2032 battery is recommended to power the sensor.



Ceiling mounted Under-desk mounted

Figure 2 Ceiling mounting and under-desk mounting

4 Detection Range without Lens Cover

Without a lens cover, EOSC and EPAC have a detection diameter of approximately 10 m when mounted on a ceiling at a height of 3 m. A lower mounting position reduces the detection diameter. Table 1 and Table 2 show typical values.

Table 1 Detection diameter without lens cover, ceiling mounting

Mounting height (m)	**2.0**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**
Detection diameter (m)	6.0	6.8	7.6	8.4	9.2	10.0

Table 2 Detection diameter without lens cover, under-desk mounting

Mounting height (m)	**0.7**	**0.8**	**0.9**
Detection diameter (m)	2.2	2.4	2.6

5 Lens Covers with Round Openings

A lens cover with a round opening reduces the detection area. Figure 3 shows a sensor without a lens cover and a sensor with a lens cover with a 19 mm opening.



No lens cover | Lens cover with 19 mm opening

Figure 3 Sensor without lens cover and with a 19 mm lens cover

Table 3 shows the typical detection diameter for ceiling mounting with round openings of 19 mm, 13 mm, and 10 mm. Table 4 shows the typical detection diameter for under-desk mounting with a 19 mm opening.

Table 3 Detection diameter (m) with round lens cover openings, ceiling mounting

Mounting height (m)	**2.0**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**
19 mm opening	2.2	2.4	2.8	3.2	3.4	3.6
13 mm opening	1.6	1.8	2.0	2.2	2.4	2.6
10 mm opening	1.0	1.1	1.2	1.3	1.4	1.5

Table 4 Detection diameter with 19 mm lens cover opening, under-desk mounting

Mounting height (m)	**0.7**	**0.8**	**0.9**
Detection diameter (m)	0.8	0.9	1.0

Figure 4 shows the typical detection diameter versus the mounting height for round openings from 10 mm to 31 mm.

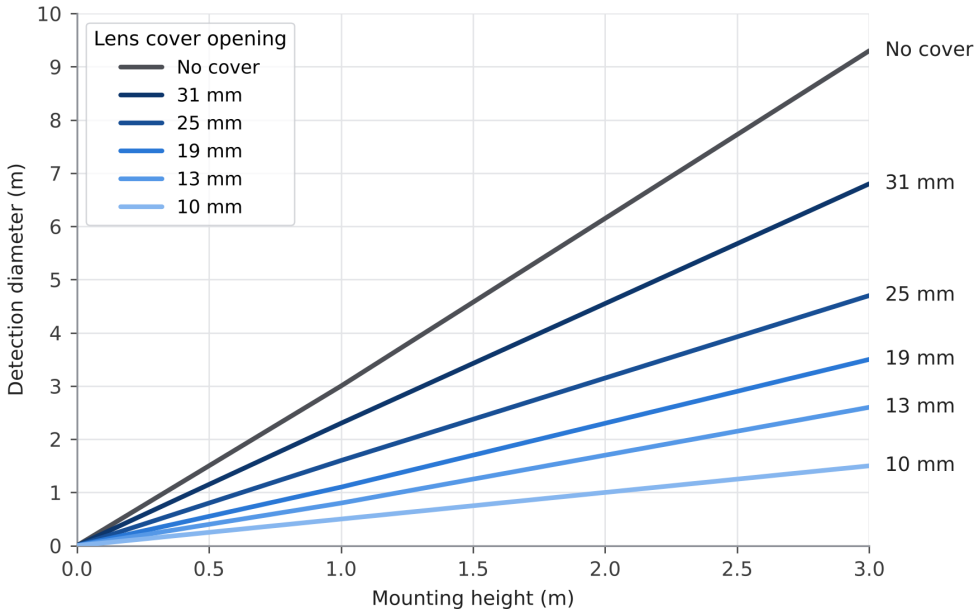


Figure 4 Detection diameter versus mounting height for round lens cover openings

6 Lens Covers with Other Openings

For special use cases, lens covers with other openings create detection areas with other shapes. Figure 5 and Figure 6 show two examples.

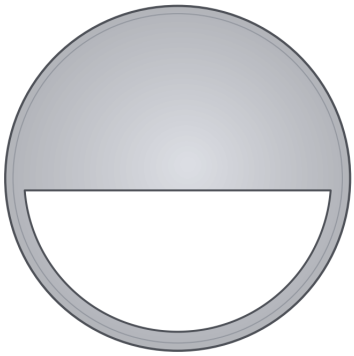


Figure 5 Lens cover with half-moon opening

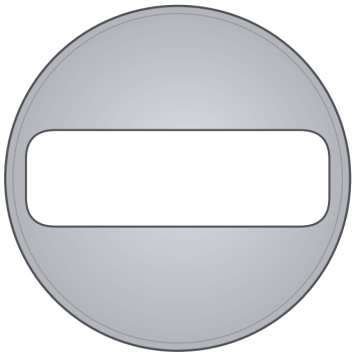


Figure 6 Lens cover with aisle opening

Note: Always test the lens cover in the real application. The size and shape of the detection area on the floor depend on the mounting height and on the segments of the Fresnel lens that the lens cover leaves open.

7 3D Printing Data

3D printing data for the lens covers described in this document (round openings of 19 mm, 13 mm, and 10 mm, half-moon opening, and aisle opening) can be downloaded from the EOSC and EPAC product pages at https://www.enocean.com/wp-content/uploads/downloads-produkte/en/products/enocean_modules_902mhz/enocean-people-activity-counter-epac/EOSC_EPAC_LensCover.zip.

With this data, the lens covers can be printed with any 3D printer or ordered from an online 3D printing service.

8 Lens Cover Mounting

The following methods are recommended to fix the lens cover to the sensor:

- **For testing:** If the lens cover must stay removable, for example with a small screwdriver, use small strips of double-sided adhesive tape or a few drops of a non-curing, liquid general-purpose household adhesive.
- **For final mounting:** Use a permanently curing liquid superglue. Apply only as much glue as needed so that no glue is squeezed out at the sides.

Note: These are only hints for special use cases. EnOcean does not accept any liability for such product modifications. The user must carry out suitable tests, mainly regarding the glue type and handling.

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