

How to adapt standard EMDCx motion sensors for Sub-Desk occupancy applications

Realization of EMDCx 3D printed lens cover

REVISION HISTORY

No.	Major Changes	Date
1	First Version	17.03.2022

Content

- 1.) Scope: Adaption of standard EnOcean EMDCx devices as Sub-Desk Sensor for Office Bench Desks (several chairs around a common table top)
- 2.) Shape of the recommended lens cover.
- 3.) Limited detection area by appropriate use of the below proposed lens cover
- 4.) Manufacturing of lens cover: fast 3D Print, possible in any usual 3D Copy-Shop e.g. ordering in Internet, appropriate print data file therefore attached.
- 5.) Gluing of the lens cover: e.g. using few punctual drops of superglue at the external periphery of the original round lens. Care must be taken, therewith not to damage the remaining central optical aperture. It is very important to respect the cover opening orientation vs. device as shown in Fig. 2!
- 6.) Battery operation is recommended because of the lack of light under desks (see Battery life under different brightness conditions according to EMDC data sheet)
- 7.) Placement of the EMDCx Sensor under Desk: Orientation according to the attached pictures.
- 8.) References

1 About EMDCx

EMDCx sensor enables the realization of energy harvesting wireless occupancy and light level sensors for light, building or industrial control systems communicating with EnOcean radio standard.

EMDCx uses a passive infrared (PIR) sensor to detect motion. Typical motion detection radius when ceiling mounted installed as recommended is up to 5 meters, see user manual. EMDC reports periodically the latest motion detection status (motion detected, or no motion detected).

EMDC is self-supplied via an integrated solar cell, which generates the energy required for its operation. EMDC requires 50 Lux illumination for 6 hours per day directly at the solar cell, which typically is equivalent 200 lux for 6 hours per day to at room level. EMDC is fully self-powered (no batteries required) under above mentioned lighting conditions.

For cases where sufficient ambient light is not available, EMDC provides the option to mount a CR2032 backup battery.

The scope of this Appnote is to show how this device can be adapted for Sub-Desk Sensor application, by correspondingly limiting its original optical detection area to specific under desk occupancy sensing application requirements. This is achieved with help of an additional optimized optical diaphragm (principle similar to the optical systems) mounted over the original PIR lens, also called lens cover.

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2. Lens cover shape

Pragmatic tests revealed that the shown lens cover shape (Fig. 1, right) would be optimal for the specific Sub-Desk application.

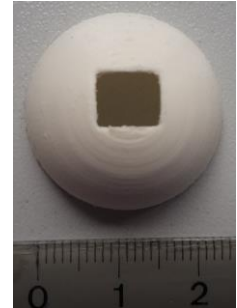


Fig. 1

3. Following picture shows device with correct mounted lens cover orientation

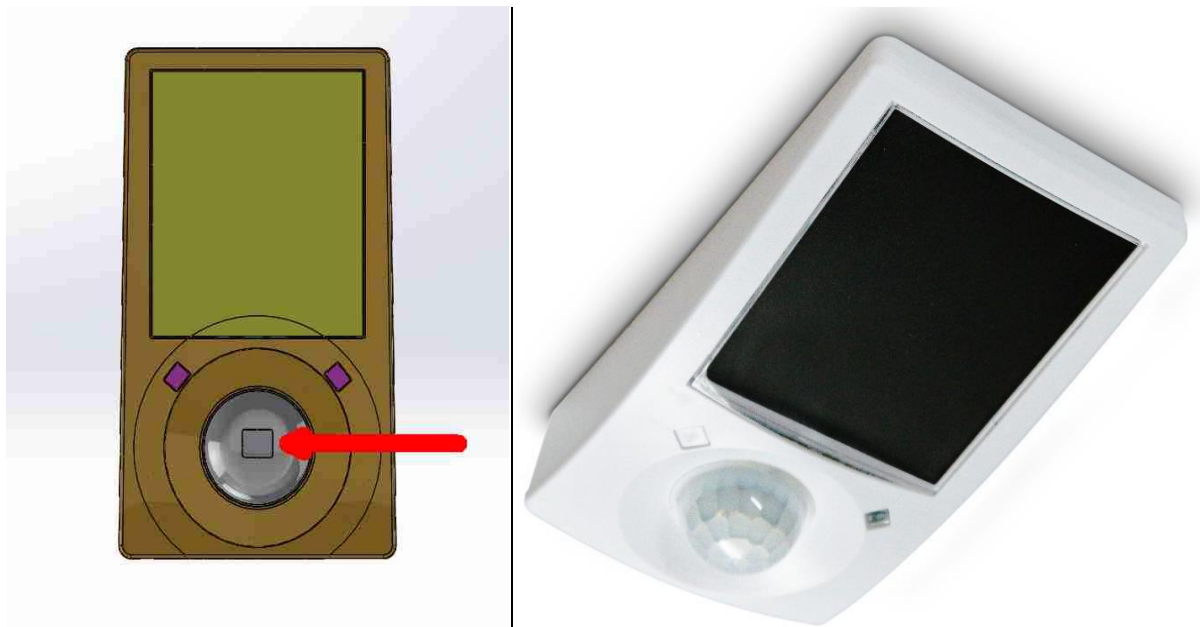


Fig. 2: Please assure that the lens cover is fixed into the position shown by the red arrow left!

4. Required Data for 3 D print of the above shown lens cover below attached.

Based on this Data, any 3D Copy-Shop can provide the required parts.



mask final 80x60cm
rectangle at 75cm.S1

5. Gluing of the lens cover on the device optical lens:

Very important! Please strongly respect the cover opening relative orientation vs. EMDCx optical lens, as shown in Fig. 2 **red arrow** above!

Use few, punctual very small drops of superglue placed at the external periphery of the original round lens. For example, two positions e.g. diametrical opposed situated at the original lens external periphery would be enough to assure good mechanical stability of the cover w/o to damage the optical lens central aperture.

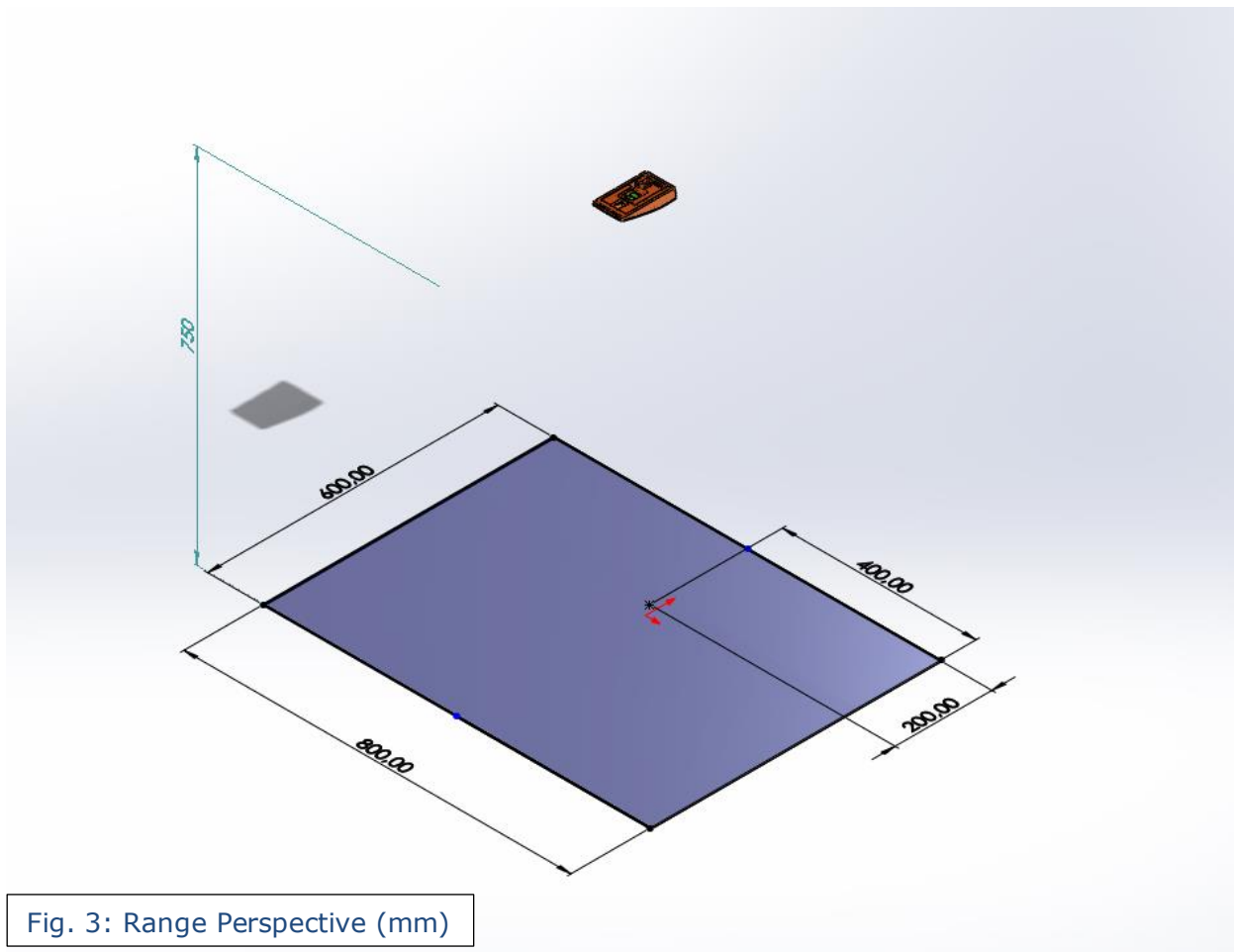
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6. Battery backup recommended:

Battery operation is recommended, because of the lack of enough light under desks, for details please check the user manual.

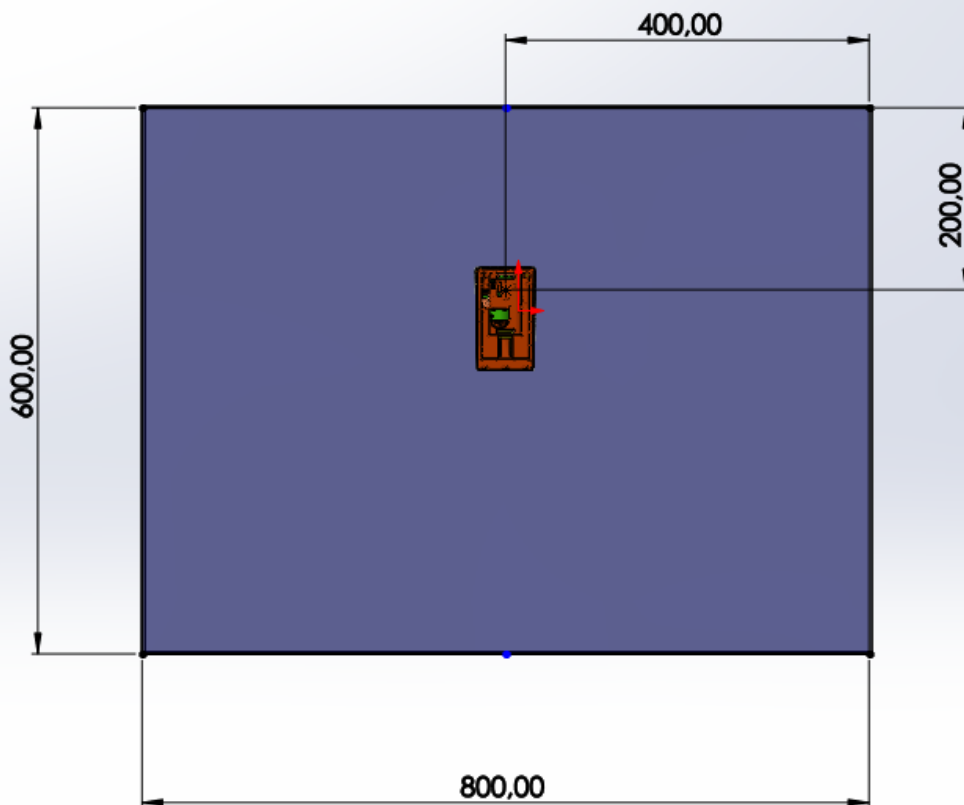
7. Placement of the EMDCx Sensor under Desk:

Orientation according to the pictures Fig. 3 (Range Perspective), Fig. 4 (Range Top) below.



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Fig. 4: Range Top (mm)



8. References:

EMDCx: all Details, User Manual and Installation Guide:

<https://www.enocean.com/en/product/motion-detector-with-illumination-sensor-emdc-oem/?frequency=868>

Disclaimer

The information provided in this document describes typical features of the EnOcean radio system and should not be misunderstood as specified operating characteristics. No liability is assumed for errors and / or omissions. We reserve the right to make changes without prior notice. For the latest documentation visit the EnOcean website at www.enocean.com.