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 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.

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.

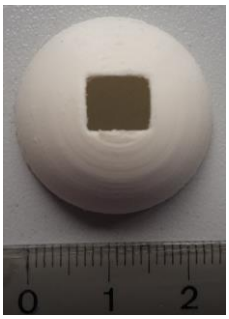


Fig. 1

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

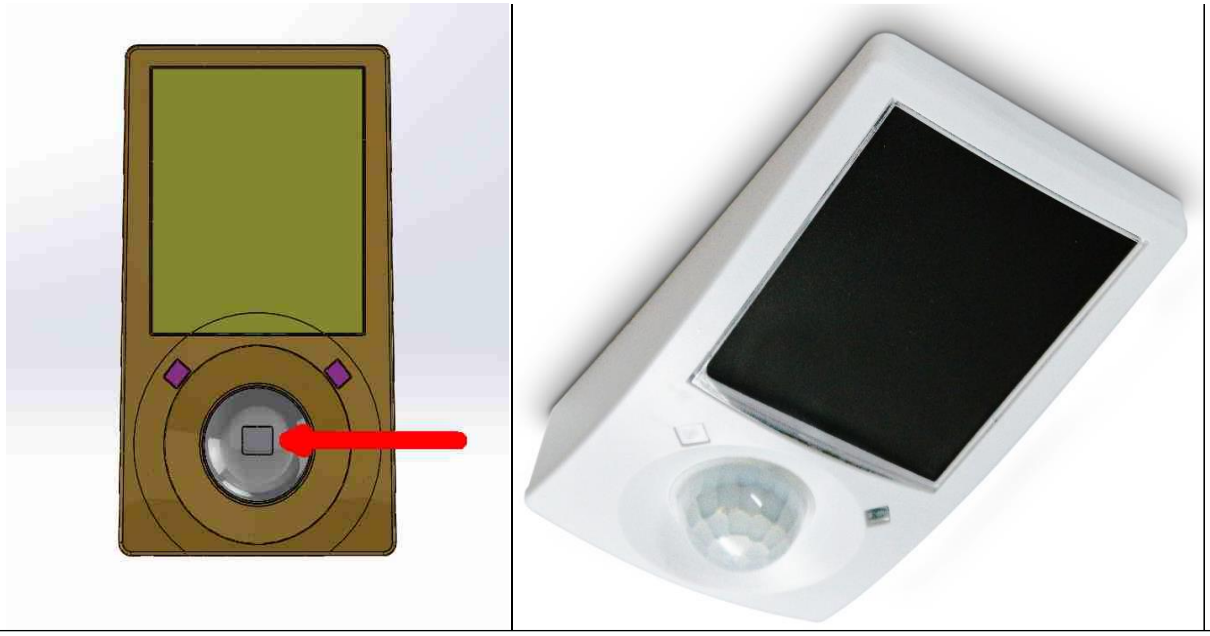


Fig. 2: Please assure that the lens cover is fixed into the position shown by the red arrow left!

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.

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.

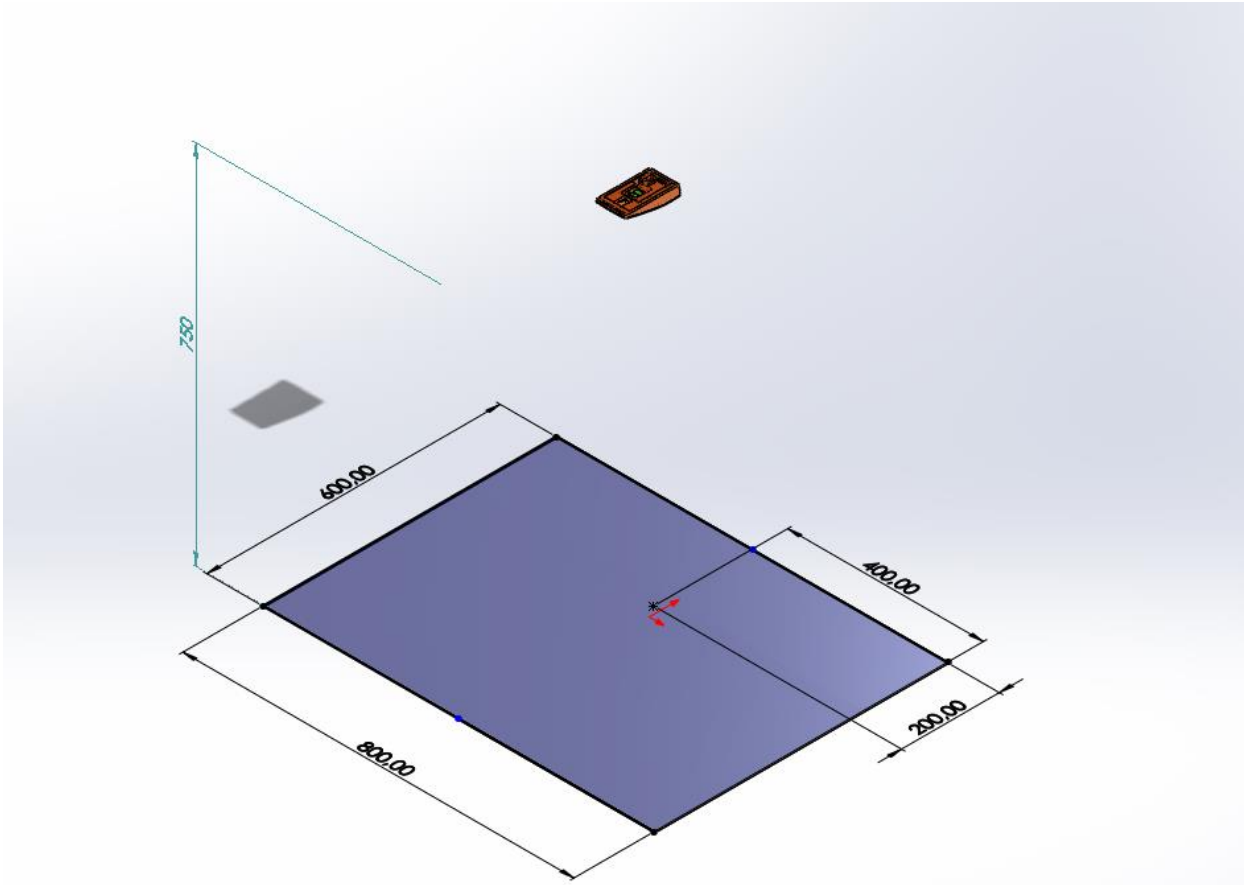
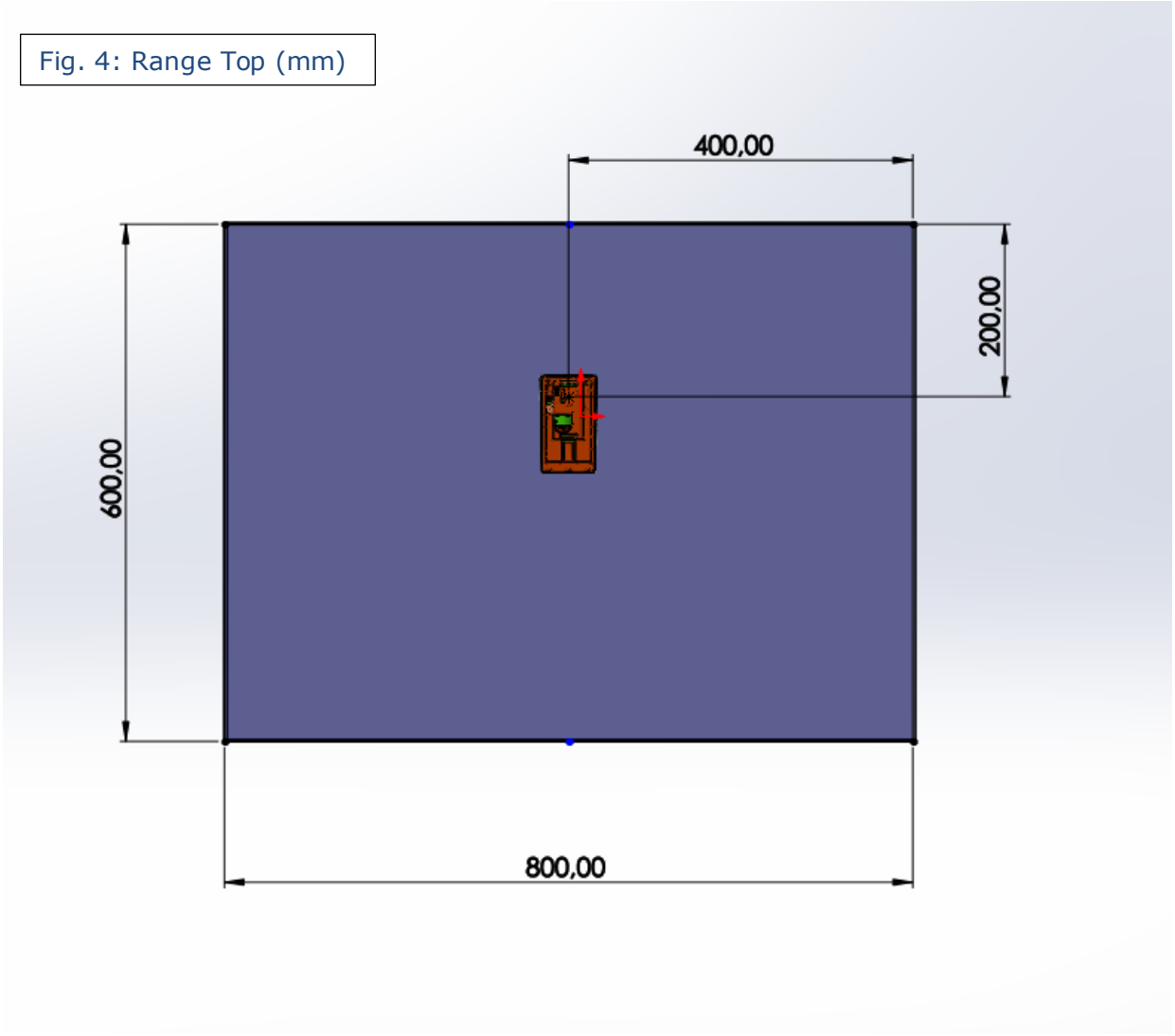


Fig. 3: Range Perspective (mm)

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