Single/double/quadruple *EnOcean* push button

References: S1B; S1W; S1PB; S1MB; S1CB; S1BB; S1DB; S2B; S2W; S2PB; S2MB; S2CB; S2BB; S2DB; S4B; S4W; S4PB; S4MB; S4CB; S4BB; S4DB

1. Included in the package

- Recessed box (outer body)
- Inner body with 1, 2 or 4 push buttons
- Red protection plate(s)
- Corresponding finishing ring(s)

2. Applications

These push buttons are suitable for installation in:

- Brick
- (Cellular) concrete
- Silica brick
- Plasterboard

Integration in wood, natural stone and other composite surfaces should be considered with the craftsman.

3. Specifications

3.1. General

The single/double/quadruple EnOcean push button is **wireless and batteryless**, the push button makes use of **Bluetooth Low Energy (BLE)** technology for communication.
The single/double/quadruple EnOcean push button has a **CE label**.

The single/double/quadruple EnOcean push button (and by extension the entire ROND range) uses the same recessed box (outer body), which considerably simplifies the installation process. The recessed box has a diameter of **131mm** and a depth of **55mm**.

In the outer body (recessed box) fits an inner body. The push buttons are pre-mounted on the inner body.

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On the inner body:

- 1 push button or
- 2 push buttons or
- 4 push buttons

can be pre-mounted.

The inner body is depth-adjustable in relation to the outer body (recessed box), this depth adjustment has 3 different positions. **The three predefined positions are 4mm, 8mm and 12mm. The inner body can be mounted up to 30 mm out of the recessed box.**

The recessed box has a click system so that several boxes (and thus push buttons) can be linked together horizontally to obtain multiple EnOcean push buttons. The cabling is connected internally via push-outs. **The centre-to-centre distance between coupled recessed boxes is 120 mm.**

The recessed box is pushed against the side wall of the cavity by means of expansion elements so that the push button locks into place. The expansion elements are tightened with torx screws. Thus, **no plaster is needed to fix the recessed box**.

The diameter of a push button is 39.5mm, with the finishing ring the outside diameter is 49.5mm. When the plastering is completed, the push buttons with finishing rings are the only visible part of the EnOcean push button.

The **centre-to-centre distance** between two push buttons in a double/quadruple EnOcean push button is **60mm**.

When multiple EnOcean push buttons are connected horizontally, the centre-to-center distance between pushbuttons of 60mm is maintained.

3.2.   Technology

An **EnOcean PTM 215B** module is built into the inner body of the single/double/quadruple EnOcean push button. This ensures that the single/double/quadruple EnOcean push button operates **wirelessly and without batteries**, and uses Bluetooth Low Energy for communication.

For a full description of the EnOcean PTM 215B module, please refer to the PTM 215B User Manual, available at: https://www.enocean.com/en/enocean- modules-24GHz-ble/details/ptm-215b/user-manual-pdf/

The EnOcean PTM 215B module uses *EnOcean's energy harvesting technology*. Each time a push button is pressed or released, mechanical energy is converted into electrical energy. This energy is used to transmit a 2.4GHz Bluetooth signal that identifies the status of the push button.

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The radio telegrams are secured with AES-128 (CBC) code. This security is based on a unique private key of the EnOcean PTM 215B.

The "long" or "short" pressing of a button (= time between pressing and releasing the button) can be calculated by the receiver. In this way the single/double/quadruple EnOcean push button can be used to switch, dim and operate blinds.

The single/double/quadruple EnOcean push button works completely autonomously; no wiring or battery is used. The push button is therefore completely maintenance-free.

3.3.   Pairing

The single/double/quadruple EnOcean push button can be paired with actuators/receivers from other manufacturers.

The document "koppeling ROND-Casambi.pdf" discusses the pairing of the single/double/quadruple EnOcean push button from ROND with the Casambi system.

3.4.   Transmissie bereik

The main factors influencing the transmission range are:
- Type and location of antennas of receivers and transmitters.
- Type of terrain and degree of obstruction on the link path.
- Sources of interference affecting the receiver.
- "Dead spots" caused by signal reflections from nearby conductive objects.

Since the expected transmission range is highly dependent on the above-mentioned system conditions, tests should always be performed to determine the reliable achievable range under the given conditions.

The following numbers can only be used as "rough" rules of thumb:
- Connections without obstructions
  Typical range 10m in corridors, up to 30m in larger open areas
- Plastered walls/Wooden walls
  Typical 10m range, through maximum 2 walls
- (Reinforced) concrete walls/ceilings
  Typical 5m range, through maximum 1 wall (depending on thickness)
- Fire rated walls, lift shafts, stairwells and similar areas should be considered as shields.

The angle at which the transmitted signal strikes the wall is very important. The effective wall thickness varies with the angle at which the signal hits the wall. Signals should hit the wall as perpendicular as possible.

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Other factors that limit the transmission range:
- Push button mounted on a metal surface (up to 30% loss of transmission range)
- Hollow walls filled with insulation on a metal film
- Lowered ceilings with metal or carbon fibre panels
- Leaded or metal-coated glass, metal furniture

The distance between the receiver and other devices emitting signals such as computers, audio and video devices emitting high-frequency signals should be at least 0.5m.

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4. Technical information

Antenna	Integrated PCB antenna
Output Power	0 dBm
Communication Range (Guidance Only)	30 m ideal line of sight / 10 m indoor environment
Communication Standard	Bluetooth Low Energy (Advertising)
Radio Frequency (min/max)	2402 MHz / 2480 MHz
Default Radio Channels	BLE CH 37 / 38 / 39 (2402 MHz / 2426 MHz / 2480 MHz)
Advertising Events per press or release	2 / 3
Default Data Rate and Modulation	1 Mbit/s GFSK
Configuration Interface	NFC Forum Type 2 Tag (ISO/IEC 14443)
Device Identification	Unique 48 Bit Device ID (factory programmed)
Security	AES128 (CBC Mode) with Sequence Code
Power Supply	Integrated Kinetic Energy Harvester
Inputs	Single/Double/Quadruple Push Button

5. Physical dimensions

Recessed box diameter	131mm
Recessed box depth	55mm
Push button diameter	39,5mm
Finishing ring outside diameter	49,5mm
distance between pushbuttons	60mm (centre-to-centre)

6. Environmental factors

Operating temperature	-25°C...65°C
Storage temperature	-25°C...65°C
Humidity	0% to 95% r.h. (non-condensing)

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