SMART
NURSE CALL

The Smart Nurse Call (SMC) is a wireless system that features both, a nurse and a porter calls and provides an ideal solution for hospitals or infirmaries to efficiently deal with requests from different areas within a building. The system is based in the Enocean technology which integrates a wireless battery-less switch and a nurse/porter call indication system. The low profile wireless switch allows great flexibility for the user to place it in any place within the served room and it also simplifies the installation process for building administrators. The system features two beacon lights to indicate that there is a pending request for either porter (blue beacon light) or a nurse (red beacon) calls. The system is also equipped with a sounder with customizable sounds that provides an identification of where a nurse/porter call was generated. Additionally, the system can be used with either Wi-Fi or Ethernet connections to a local server so that a map of the alarms can be displayed in a screen or tablet.

Detailed description

The Smart Nurse Call (SMC) integrates both a solution for patients for nurse or porter calls and a fast identification way for hospital staff to locate a call request within the facilities. The wireless switch includes 4 buttons for the different requests of the system, namely, a button for nurse call, a button for nurse call reset, a button for porter call and a button for porter call reset. The switch is based on the wireless battery-less Enocean technology which allows the user to place the switch anywhere within the room. Alternatively, if a wall mounted switch is required, the switch also includes screw slows on its back so that it can be easily installed on any wall.

The SMC kit includes a panel that can be mounted in the ceiling of the building. Moreover, the SMC panel includes two beacons and a sounder, both of which include screw holes that make the system easy to install in all kinds of tiles and ceilings without being intrusive to the building's infrastructure. The low profile 3 W sounder emits a sound and/or voice message identifying the room/area where a porter or nurse calls are generated. The SMC offers an on-request customization of sounds and voice messages to act as identifiers for the rooms/areas where the system is set up.

When either the porter or nurse call button is pressed, the corresponding beacon (blue for porter call, red for nurse call) will start flashing. Additionally, the sounder will start emitting the pre-selected sound and/or message identifying the area. The system will continue this behaviour until the nurse call reset or porter call reset buttons are pressed, respectively.

As an added feature, the system includes an RS485 interface via an Ethernet jack that allows the system administrator to activate the same nurse call indicator in more than one area within the building and not only in the room/area where the nurse call was generated. By simply daisy-chaining a CAT5/CAT6 cable between SMC panels, the network is automatically setup and a cluster of SMC panels is created. Then, when the nurse call button is pressed in a given room/area, an alarm signal is sent to all the daisy-chained SMC panels and in all of them the nurse call beacon will start flashing and the sounder will emit the identification sound for the area that generated the alarm. This feature allows a higher level of awareness for critical areas as an alarm can be heard and identified in other areas of the building and not only in the place where the alarm was generated.

The SMC can be used in an offline or online mode. In the offline mode, the core features previously described are implemented. On the other hand, the online mode adds another dimension for the global monitoring and effective reaction to the requests generated within the building on top of the core features. In the online mode, the information received by the system is made available to a server which can in turn generate alarm maps of the building. Therefore, with the use of a screen or tablet, the system administrator can have a global view of where and when the nurse and porter calls are being generated. The connection between the SMC panels and the server can be done either via Ethernet or Wi-Fi.

Features

- Enocean wireless, battery-less switch
- Blue beacon (porter call)
- Red beacon (nurse call)
- 3 W Sounder

- Interface to a networked screen or tablet
- Customizable sound identifiers
- Wi-Fi/Ethernet connection
- RS485 Interface

Specifications

Power supply	7 – 45 VDC
Frequency	868.3 MHz
Data rate	9600 – 115200 bauds
Operating Temperature	-20°C to 40°C
Antennae	Helix antenna for receiver/Zigbee, Pre-installed whip antenna for switch
Wireless distance range	100 m line of sight (this varies depending on the positioning of the SMC panels)
Sounder impedance	4 Ω
Sounder power	3 W
RS485 impedance	100 Ω

Schematics

Information regarding physical and technical aspects of the Smart Nurse Call are presented in Figures 1 to 4. The dimensions of the beacons are shown in *Figure 1* for both, the side and bottom view. The sounders for the Smart Nurse Call are presented in *Figure 2* for the top, side and bottom view. *Figure 3* shows the dimensions of the switch. Finally, the typical network implementation is presented *Figure 4*. The implementation shown in *Figure 4* represents the online mode in which the alarms generated within the building are displayed in a screen. As described in section *Detailed description*, this can be achieved by networking all the nurse call panels to a server via the switch shown. Alternatively, the connection to the network can be carried out via Wi-Fi. If on the other hand, an offline implementation of the system is required, then all connections to the switch (CAT5/CAT6 cables on top of the Smart Nurse Call panels) can be removed. Also, in *Figure 4* a cluster shown. This is done by daisy chaining the Smart Nurse Call panels (CAT5/CAT6 cables at the bottom of the Smart Nurse Call panels). As described in in section *Detailed description*, this means that when a nurse call button is pressed in a room, then the beacons in the daisy chained panels will start an alarm and the sounders will emit the identification sound for the room where the alarm was generated. If a stand-alone system is required instead, where the nurse call alarms need to only be present in the room where the alarm was generated, then the CAT5/CAT6 connections at the bottom of the Smart Nurse Call panels can be removed.
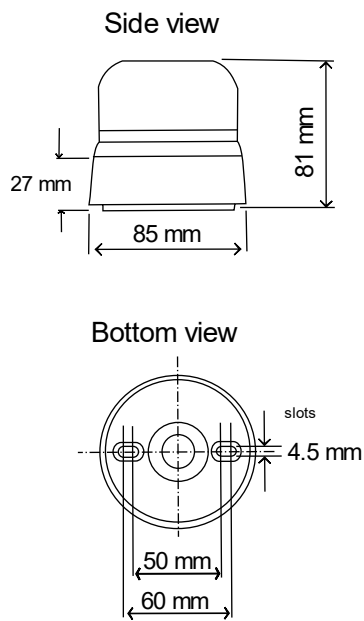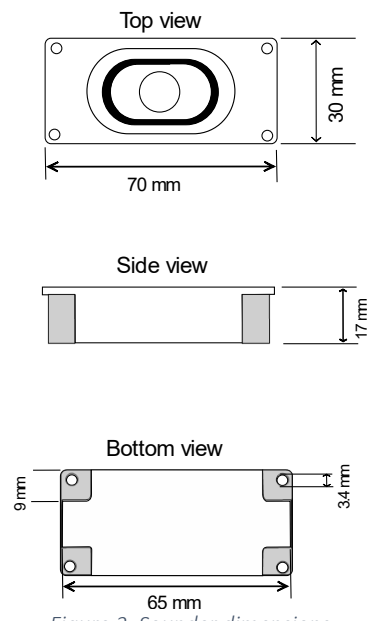
Dimensions

Side view

81 mm

27 mm

85 mm

Bottom view

slots

4.5 mm

50 mm

60 mm

Figure 1. Beacons dimensions

Top view

30 mm

70 mm

Side view

17 mm

Bottom view

9 mm

3.4 mm

65 mm

Figure 2. Sounder dimensions

Top view

PORTER	NURSE
RESET	RESET

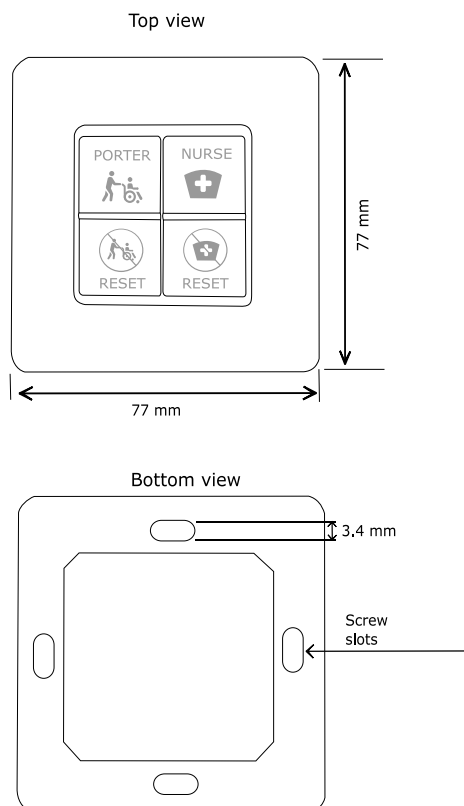77 mm

77 mm

Bottom view
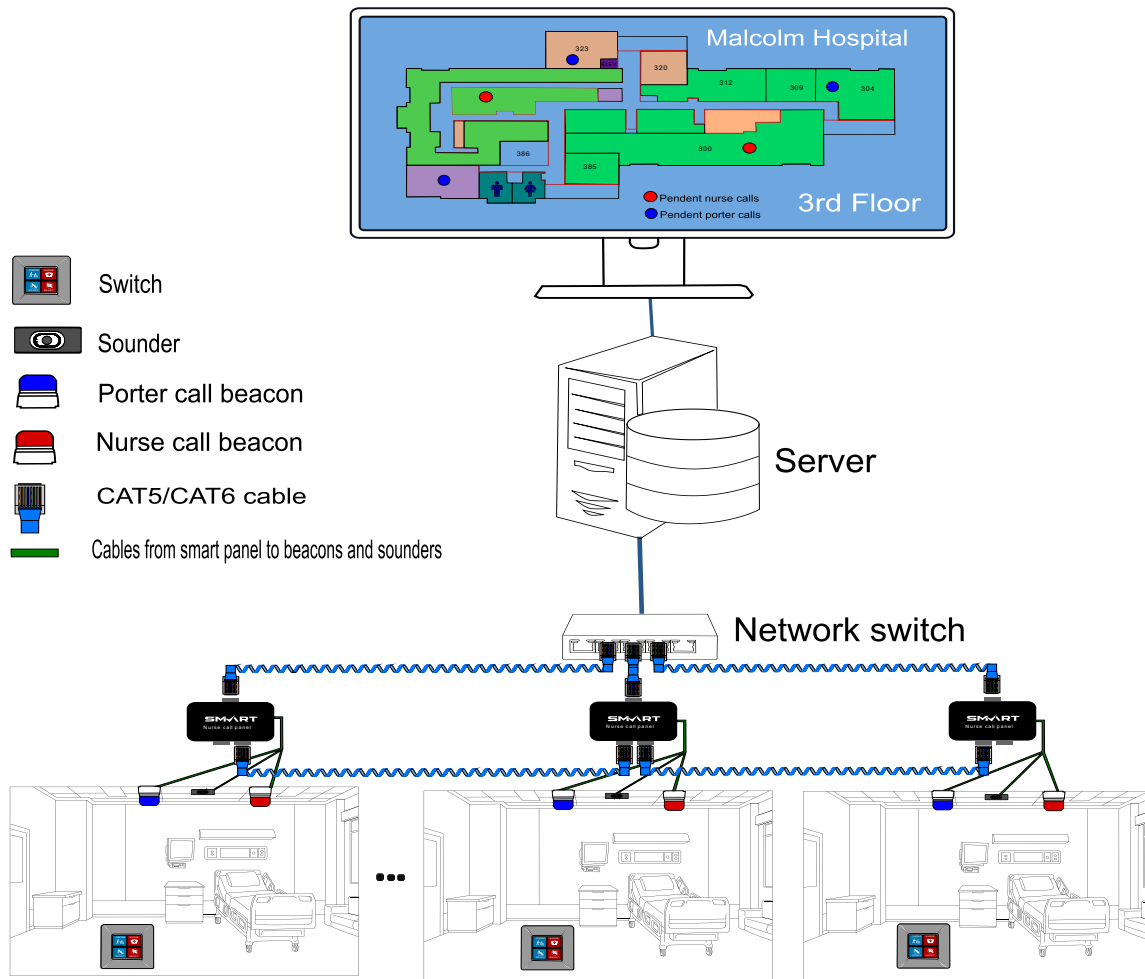
3.4 mm

Screw
slots

Figure 3. Switch dimensions

System implementation

Figure 4. Smart Nurse Call implementation