

eLea™

Home Care Installation Manual



Home Care Installation Manual

MariCare Professional Care Solutions for Elderly Care Sector

MariCare™

Member of MariElectronics Group

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1. INTRODUCTION

MariCare™ is the leading provider of Professional Care Solutions for the Elderly Care sector. Since its introduction to the market in 2005, Elsi® Care Solution with the Elsi® Smart Floor, has been the unchallenged forerunner in its field, and has been selected by many new Elderly Care facilities for its performance, uniqueness and newly innovated features for improved service and quality. eLea™ Activity Sensing is the newest solution, specially developed for existing Healthcare facilities & Home Care.

This manual is specifically for

- Home Care installations, includes small Elderly Care Homes, Nursing Homes, Rehabilitation Homes, and private Homes.
- Retro fitting existing facilities, which may/will already contain fire detection sensors, nurse call systems, phones, etc. but still requires a fall detection system

eLea™ Activity Sensing is a wireless solution and the installation of the devices requires accurate positioning to allow the sensor to function perfectly and always provide the best service for which it has been designed.

This document includes

- An overview of the equipment
- The theory and method for positioning the equipment
- The Installation procedure for the equipment

1.1 PERSONNEL QUALIFICATIONS FOR MAINTENANCE WORK

Note: All eLea™ Activity Sensing products are easy to install, but installation, maintenance and service work needs to be carefully made according to instructions.

2.OVERVIEW OF THE eLea™ HOME CARE SYSTEM

All eLea™ products are based on wireless “EnOcean®” technology. The eLea™ components communicate and send the fall, burglar or fire alarm to the eLea™ Gateway, which is connected to the eLea™ Server via internet or 3G.



Figure 2.1 Overview of the eLea™ Home Care System

2.1 eLea™ SOLUTION FUNCTIONS

The eLea™ Activity Sensing Solution has a full complement of standard and optional functions that can cover every situation for elderly care.







Equipment	Description/Comments
eLea™ Activity Sensing Solution to detect a person falling 	Sends a signal if both sensors first see movement by an infrared source, followed by only the lower sensor seeing movement by the infrared source.
eLea™ Activity Sensing Solution to detect activity 	Sends a signal when both sensors see movement by an infrared source and no prior activity has been detected for a specified time (configurable by software).
Door Monitor 	Sends a signal when the door is open
Switch 	Alarm button eg. toilet/bed
eLea Bracelet 	Alarm Bracelet for Summoning Help
Lighting Control 	Switches on the lighting when movement indicates the resident is out of bed
Burglar Alarms	Optional-Special System Design
Switching off the electricity when leaving premises	Optional-Special System Design
Shutting off the water when leaving premises	Optional-Special System Design
Adjusting the room temperature when leaving premises	Optional-Special System Design

Table 2.2 eLea™ Activity Sensing Equipment

3. eLea™ ACTIVITY SENSING WORKING RANGE

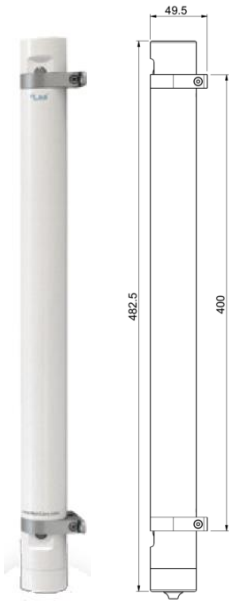


Figure 3.1 eLea™ Activity Sensing

The eLea™ Activity Sensing is a tubular, waterproof device (IP44). Its body length is 482.5 mm and when fixed to a wall, it stands out from the wall 49.5 mm.

The small indentations on the side of the tube at the top and the bottom of the detector are where the PIR (Passive Infrared) sensors are located.

It is essential that the eLea™ Activity Sensing concept is clear, so fitters can install the detector with an in-depth understanding of the necessity to position the detector with the utmost accuracy.

The eLea™ Activity Sensing have a specific operational range and direction.

The vertical detection angles of the eLea™ Activity Sensing' two PIR sensors are shown in Figure 3.2.

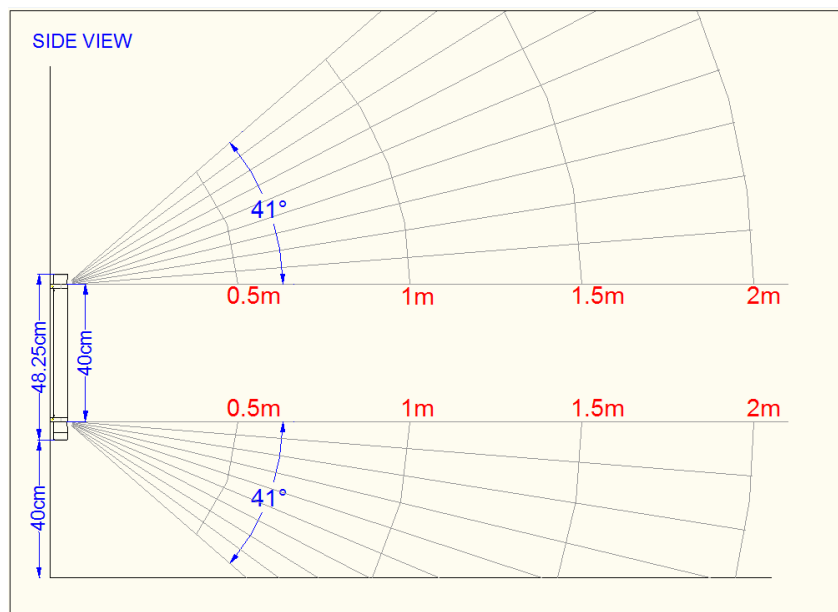


Figure 3.2 Vertical Detection Angles

The detector must be positioned so that the detection angle of the top sensor ranges from horizontal upwards to an angle of 41°, while the detection angle of the bottom sensor ranges from horizontal downwards to an angle of 41°. The separate infrared sensors retrieve

independent information that is analysed by the eLea™ Activity Sensing.

With this in mind, the eLea™ Activity Sensing is positioned at a suitable location on a wall with its lower end 400 mm above the floor. The eLea™ Activity Sensing must be fixed vertically in a position to ensure the horizontal angle of the sensors.

Before the eLea™ Activity Sensing is finally secured, the position of the horizontal detection angle must be adjusted to the correct position. The range of the horizontal detection angle is 94° as shown in Figure 3.3.

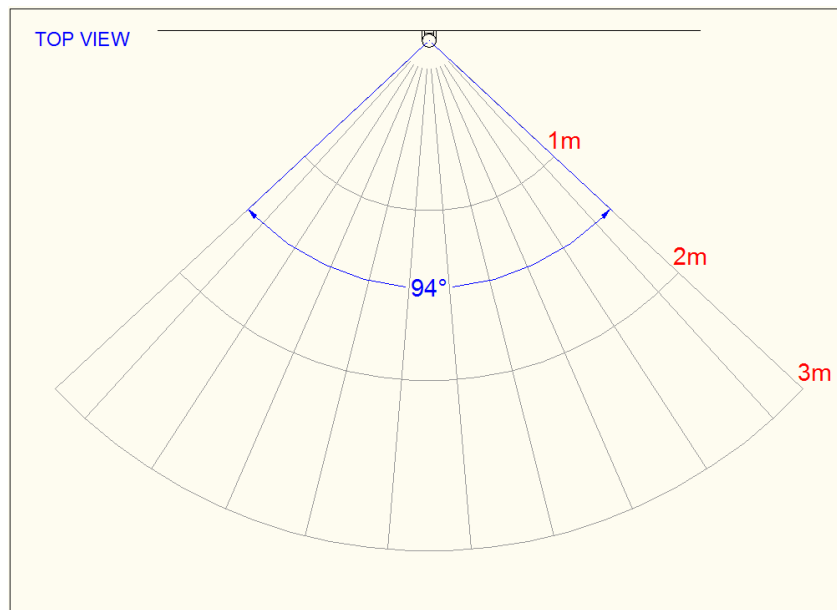


Figure 3.3 Horizontal Detection Angle

The detector should be rotated so that this range of 94° encompasses the area of the room or space that is required to be surveyed.

Other points when deciding on the location of the eLea™ Activity Sensing:

- The sensitivity of PIR sensors decreases with distance, which in practice means that the farther away a person is from a PIR sensor; the more exaggerated movement must be to trigger a response from the eLea™ Activity Sensing
- Ideally, the best PIR sensor response is achieved within 3 metres of the eLea™ Activity Sensing
- The maximum detection range is 5 m

3.1 HOW AN eLea™ ACTIVITY SENSING WORKS

When an eLea™ Activity Sensing is active, it detects infrared from the area it has been designed to survey.



Figure 3.4 Both Bottom and Top PIR Sensor detects the Presence of a Person

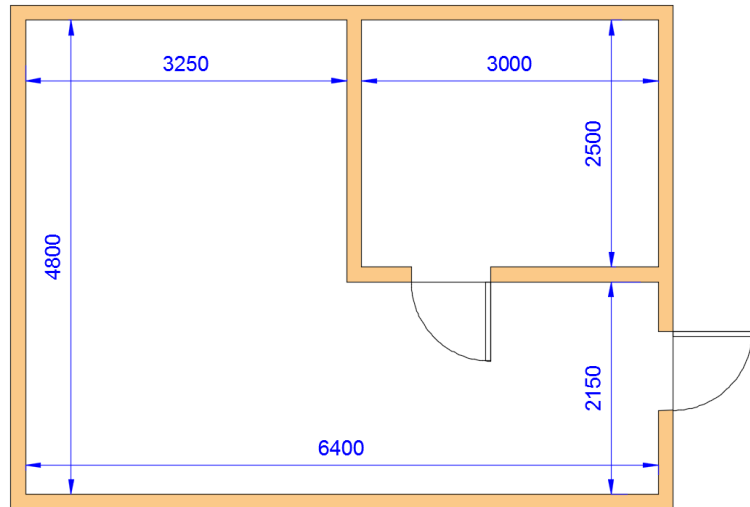
When a person enters the surveyed area both sensors pick up the presence (viz. IR and movement) of the person as shown in Figure 3.4.



Figure 3.5 Only the Bottom PIR Sensor now detects the Person, triggering an Alarm

If a person falls while still within the range of the device as shown in Figure 3.5, the top sensor cannot now detect the presence of the person while the bottom one can, which causes the eLea™ Activity Sensing to send out a fall alarm.

3.2 POSITIONING DETECTORS



An accommodation unit will have a WC and one or two living areas. One or two eLea™ Activity Sensing detectors are required in the WC, and one or more in each living space.

Figure 3.6 Example of an Accommodation Unit

Typically, the WC will include a washbasin, toilet and shower. The eLea™ Activity Sensing detectors should be placed in a position so that neither the toilet bowl nor washbasin becomes an obstruction to the eLea™ Activity Sensing's field of view.

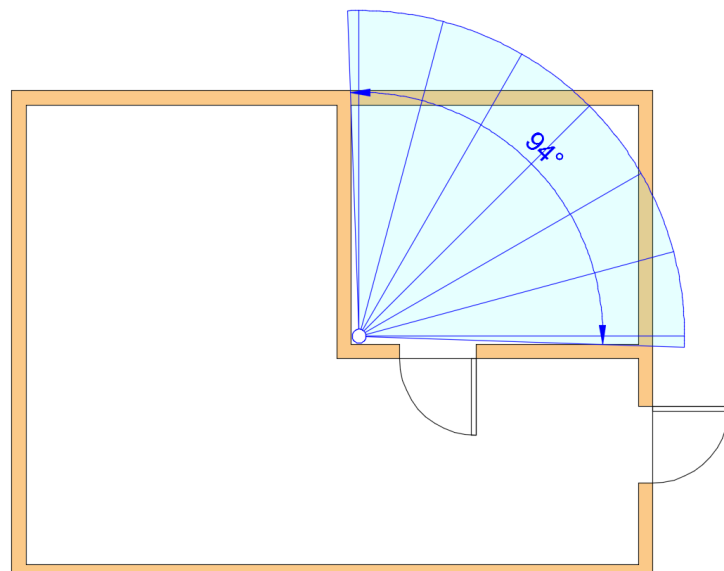


Figure 3.7 Positioning an eLea™ Activity Sensing in a WC

The living area needs more consideration. A living area with perhaps a bed, bedside table, etc. such as in Figure 3.8 with the WC door expected to always be closed could be served by a single eLea™ Activity Sensing but that is seldom the case.

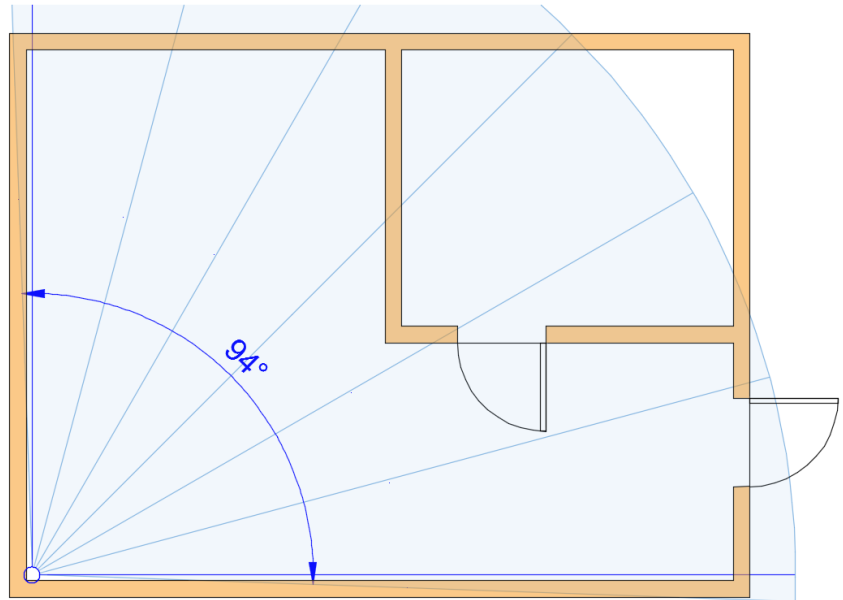


Figure 3.8 Positioning an eLea™ Activity Sensing in an Unobstructed Room

In Figure 3.9 it can easily be seen that a piece of furniture and the WC door left open limits the eLea™ Activity Sensing's field and the entrance to the accommodation is hidden from the eLea™ Activity Sensing's field range. See the blue shaded area on the figure, which indicates the obstructed area.

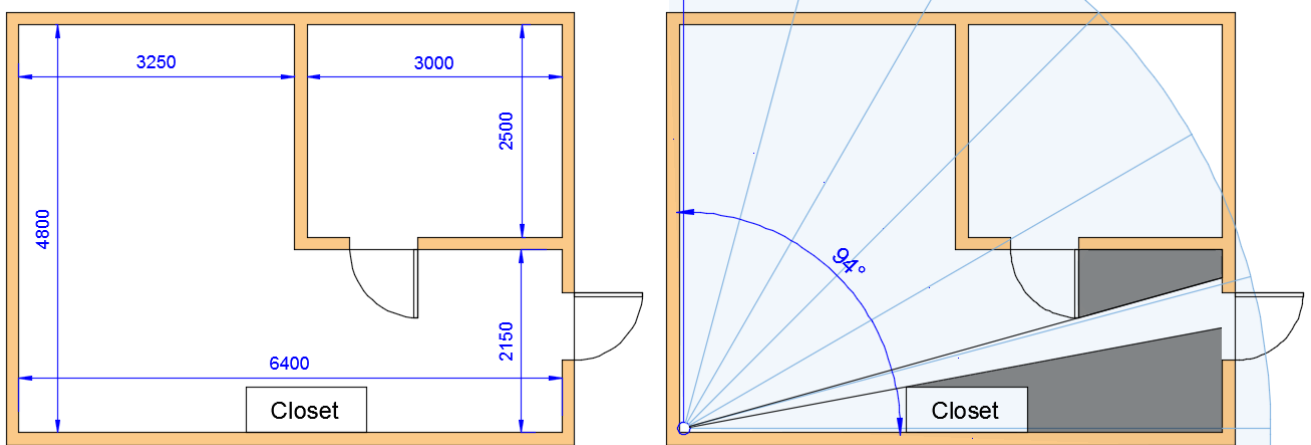


Figure 3.9 Obstructions will limit the Detectors Field of View

To compensate for these obstructions, a second eLea™ Activity Sensing is installed at the accommodation's entrance as shown in Figure 3.10.

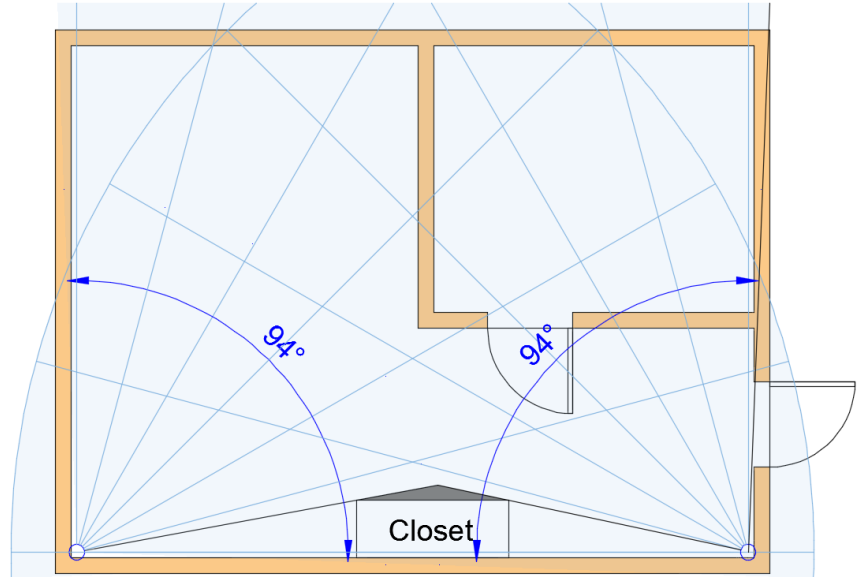


Figure 3.10 A Second eLea™ Activity Sensing eliminates the Problem of the Obstructed Area

It immediately becomes obvious the living area shown in Figure 3.10 is now within the range of one or both detectors. See the blue shaded area on the figure, which indicates the obstructed area.

It is therefore necessary to check that the eLea™ Activity Sensing(s) have an unobstructed field of view to operate in, and if an obstruction comes within the field of view, either or both of the eLea™ Activity Sensing(s) should be relocated to the optimum position or one or more extra eLea™ Activity Sensing(s) should be installed to cover each obstructed area in the room.

Note: Ideally, an eLea™ Activity Sensing should not be positioned in a way that it faces out of an open doorway or window, as it may detect movement unrelated to the activities within the controlled living space.

4. INSTALLING AN ^eLEA™ ACTIVITY SENSING UNIT

Once the ^eLea™ Activity Sensing theory and practice is understood, the fitter has no difficulty appreciating what is required.



Figure 4.1 Mark the Height of the ^eLea™ Activity Sensing Clamps

- The positions of the holes to be drilled in the wall for securing the lower the ^eLea™ Activity Sensing clamp are marked (i.e., about 45-46 cm above the floor), the holes are drilled and the ^eLea™ Activity Sensing lower clamp is screwed lightly in place on the wall. See Figure 4.2.



Figure 4.2 Secure the Lower the ^eLea™ Activity Sensing Clamp lightly in Place

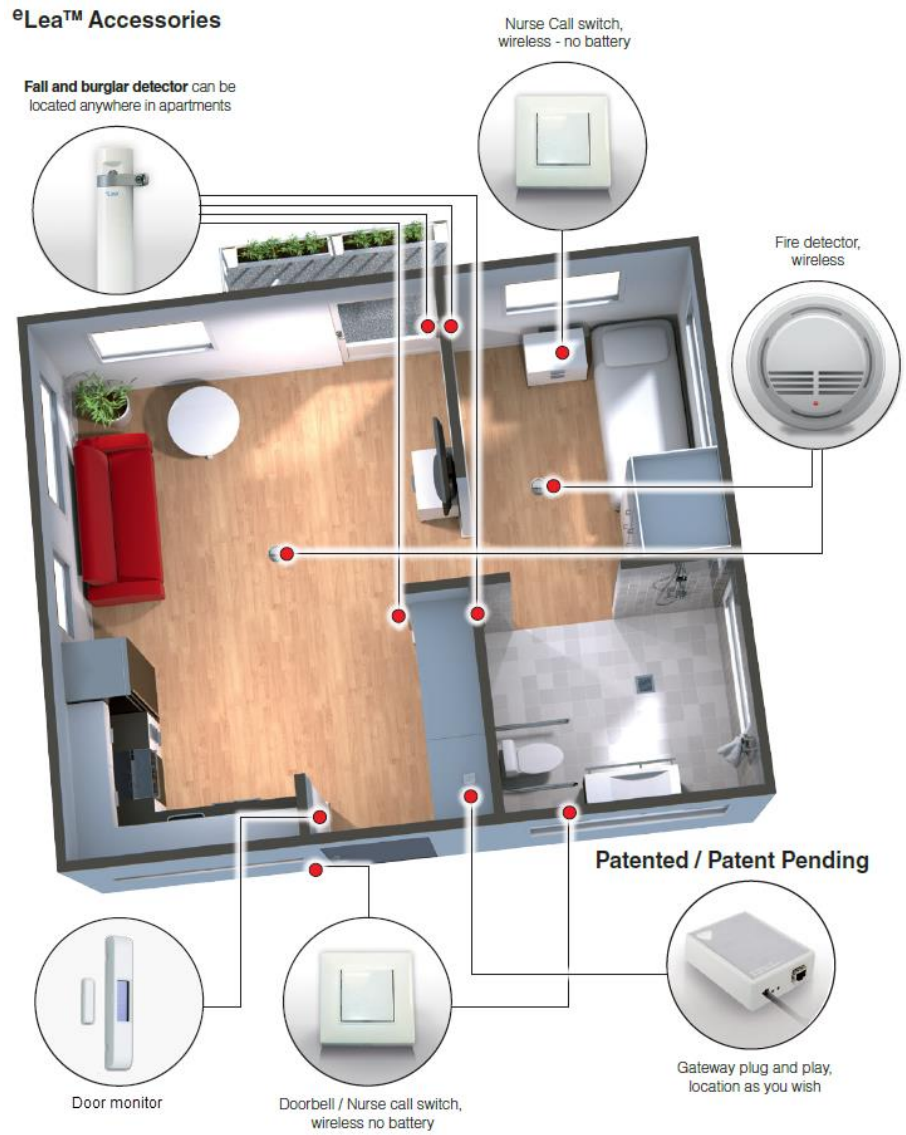
- The eLea™ Activity Sensing must be checked with a spirit level in both vertical directions before the holes to be drilled for the upper clamp are marked, the holes are drilled and then the eLea™ Activity Sensing clamp wall screws are tightened firmly in place
- When the vertical alignment is assured, the eLea™ Activity Sensing clamp's locking screws are sufficiently loosened to allow the eLea™ Activity Sensing tube to be swivelled in the clamps until the horizontal detection angle of the eLea™ Activity Sensing encompasses the correct area of the room or place to be surveyed.
- Once the eLea™ Activity Sensing has been positioned satisfactory both vertically and horizontally, the holding screws can be tightened, so the detector is fixed firmly in place

Note: If the wall where the eLea™ Activity Sensing is placed is out of vertical alignment, the eLea™ Activity Sensing clamp screw placements can be shimmed with washers to ensure the vertical alignment of the eLea™ Activity Sensing on the wall.

Note: The FD05R and the FD05R9V versions of the eLea™ Activity Sensing are wireless; however, the FD05CR version will need a connecting power cable and power supply. See section 8 Appendices.

5. COMMUNICATION INSTALLATIONS

Once the eLea™ Activity Sensing(s) are in place, the units communication equipment can be installed.



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Figure 5.1 Example of eLea™ Activity Sensing Equipment Locations

The Gateway has a maximum range of 15 m, and as long the associated eLea™ Activity Sensing equipment is within that range, there should be adequate communication between the gateway and all of the system's home care components.

Structural considerations should be taken into account when installing communications equipment.

See section 5.1 Installation Considerations

The Gateway requires a power supply and an Ethernet connection.

The Ethernet needs to be connected to a router or modem that provides Internet access and has DHCP enabled.

All other eLea™ Activity Sensing Equipment is working with wireless and their location is determined solely by their function.

This equipment includes,

- Nurse call switch outside the entrance
- Nurse call switch by the bed
- Fire detectors on the ceiling

In a house where the floors and walls are constructed of light material such as wood, a single centrally-placed gateway will have a signal intensity that is enough for all of eLea™ Activity Sensing equipment in the building.

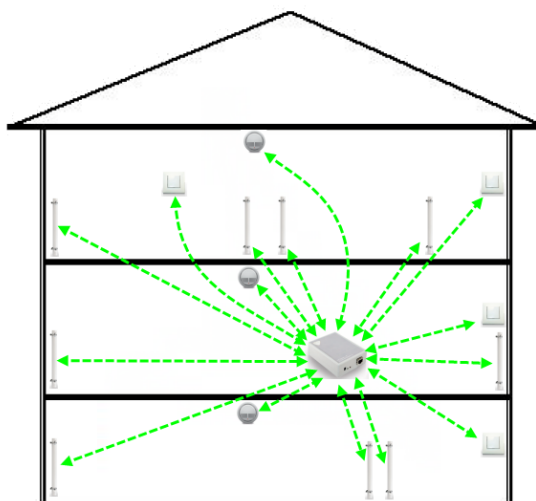


Figure 5.2 Example of eLea™ System with a Single Gateway

5.1 INSTALLATION CONSIDERATIONS

The building structure must be considered when planning the installation for an eLea™ system layout.

- If the partitioning structure between rooms is of dense material (e.g. reinforced concrete, stone, steel, etc.), it reduces the intensity of the signals passing through it; however, if the partitioning structure is of light material (e.g. gypsum board, plywood, etc.), it will have an insignificant effect on the intensity of the signals passing through it
- Solid objects (e.g. heavy furniture, pianos, stairs, etc.), objects made from metal (e.g., cabinets, lockers, ventilation ducts, etc.) and interference from electronic equipment can disturb and affect the intensity of the signals. Test all device locations to make sure the radio telegrams are delivered. If necessary move the gateway to a better position, so all devices are within range.
- Each gateway controls a circular area of 15 meter radius. A greater distance from the gateway may be possible in ideal circumstances.

6.SETTING UP THE SYSTEM

The following sections describe the steps for setting up an eLea™ System through an Internet browser.

6.1 ACCESSING THE SYSTEM

The system is set up using the elea.elsi.fi web site provided by MariCare™.

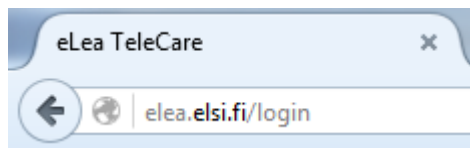


Figure 6.1 eLea™ System Web Site Address

Note: the eLea™ System web site address automatically starts by displaying the Login dialogue window.

6.2 USER ACCOUNT

The first time the system is used, the user must create an account. After that the user can login by entering the user name and password as in

Figure 6.2.

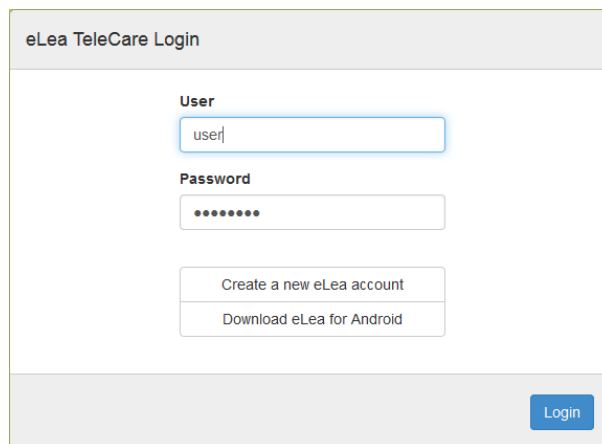
A screenshot of the 'eLea TeleCare Login' form. The form has a title bar 'eLea TeleCare Login'. It contains two input fields: 'User' with the text 'user|' and 'Password' with masked characters '.....'. Below the password field are two buttons: 'Create a new eLea account' and 'Download eLea for Android'. At the bottom right of the form is a blue 'Login' button.

Figure 6.2 Logging in to the eLea™ System

In the registration phase enter all the required information in the 'eLea Telecare Registration' dialogue window.

eLea TeleCare Registration

Gateway serial number
Enter gateway serial
Invalid serial number

Account owner
Enter owner name
Account owner required

Phone number **Email address**
Enter phone number Enter email address
Phone number required Email address required

Login name
eleatest

Password **Confirm password**
•••••••• Enter password
Password required Passwords do not match

I agree to the [terms and conditions](#) of the eLea TeleCare service.
Agreement required

Create an account

Figure 6.3 eLea™ TeleCare Registration

The gateway serial number can be found on the underside of the device as show in

Figure 6.4.

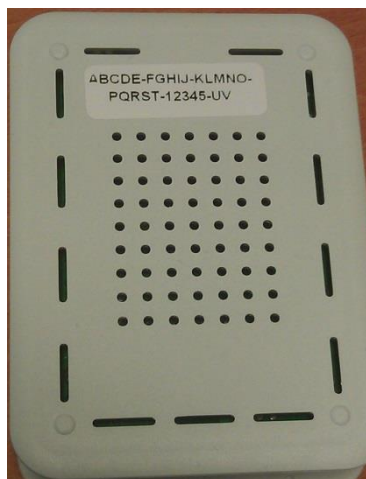


Figure 6.4 Serial Number

6.3 USER INTERFACE OVERVIEW

eLea TeleCare Overview Sites Contacts Logs Account ⚙️ ↻

Welcome maricare

Overview

Notices

21.10.2016 16:03 Site 53: Mr. Brown, Virna Road 3A is offline.

Mr. Brown, Virna Road 3A

🏠 4 hours 🚶 4 hours - Vestibul 🍴 6 hours 👥 4 visits

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

Mo 21.08. Su 20.08. Sa 19.08. Fr 18.08. Th 17.08. We 16.08. Tu 15.08.

Recent Alarms Acknowledge all

18.08.2017 14:27:42	📶 Activity	Mr. Brown, Virna Road 3A
16.08.2017 14:27:42	📶 Activity	Mr. Brown, Virna Road 3A
12.08.2017 14:27:42	📶 Activity	Mr. Brown, Virna Road 3A

Figure 6.5 eLea Activity Sensing user interface overview

The overview of the shows the name of the resident, daily activities and the routines in the past 8 days as well as the activities and recent alarms.

6.4 RESIDENT PRESENCE

House icon tells if the resident is inside the house or outside. In the example below, the resident has been inside for 4 hours.

The color of the icon is white when the resident is inside.



When the resident is outside the color changes as follows:

0 - 4 hours => green


4 - 8 hours => yellow

8 - hours => red

The resident is considered to have left the house, if the last motion detection was from a detector located in the entrance of the house and 5 minutes has passed without detections from other motion detectors.

6.5 LATEST MOTION

The walking man field tells the time elapsed since the last motion detection from inside the house. It also gives the name of the detector that did the detection. In the example below, the resident has been inside for 4 hours.

 4 hours

The color of the icon changes as follows:


0 - 4 hours => green

4 - 8 hours => yellow

8 - hours => red

6.6 MEAL

The meal field tells the time elapsed since the door of the refrigerator was last opened. In the example below, the resident has not opened the refrigerator for 6 hours.

 6 hours

The color of the icon changes like above:

0 - 4 hours => green

4 - 8 hours => yellow

8 - hours => red

6.7 TOILET VISITS

The toilet field tells the number of times the resident has visited the toilet since the beginning of the day (00:00:00). In the example below, the resident has visited the toilet 4 times.



The color of the icon is chosen according to the following rules:

No bathroom activity indicator => white











0 – 0.75 => green

0.75 – 1.0 => yellow

>= 1.0 => red

6.8 TIMELINE

The time line illustrates the movements of the resident. Each location visited by the resident is shown as a colored bar whose length corresponds to the time the resident spent in that location. The colors and icons are as follows:

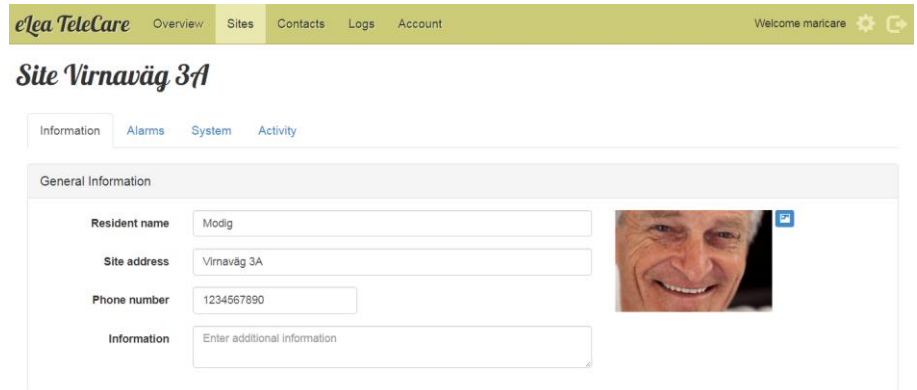
		Bedroom.
		Kitchen. The icon, if present, tells when the fridge was opened.
		Outdoors.
		Bathroom.
		Living room or entrance.
		Other or unknown location.

The icon is visible when the length of the visit is > 30 min or the location is bathroom or the icon is the meal icon.

6.9 HISTORY

Clicking the down arrow reveals the time line for the last 7 days.

6.10 INFORMATION



The screenshot shows the 'eLea TeleCare' web interface. The top navigation bar includes 'Overview', 'Sites', 'Contacts', 'Logs', and 'Account'. The user is logged in as 'Welcome maricare'. The main heading is 'Site Virnaväg 3A'. Below this, there are tabs for 'Information', 'Alarms', 'System', and 'Activity'. The 'Information' tab is active, displaying a 'General Information' form with the following fields: 'Resident name' (Modig), 'Site address' (Virnaväg 3A), 'Phone number' (1234567890), and 'Information' (Enter additional information). A profile picture of a man is visible on the right side of the form.

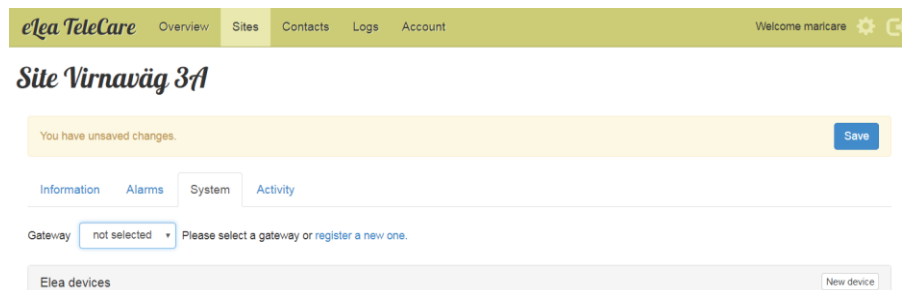
Figure 6.6 Resident information

Resident's detail info: name, site address, phone number and additional information.

6.11 CREATING NEW SITE

After creating a user account, the user must go to the 'Sites' tab and click 'New site', where the basic information for the site is entered.

What is absolutely essential is to click on the 'System' tab and select a gateway from the dropdown list and press 'Save'.



The screenshot shows the 'eLea TeleCare' web interface. The top navigation bar includes 'Overview', 'Sites', 'Contacts', 'Logs', and 'Account'. The user is logged in as 'Welcome maricare'. The main heading is 'Site Virnaväg 3A'. Below this, there are tabs for 'Information', 'Alarms', 'System', and 'Activity'. The 'System' tab is active, displaying a 'Gateway' dropdown menu with 'not selected' and a 'Please select a gateway or register a new one.' message. A 'Save' button is visible in the top right corner. A 'New device' button is visible in the bottom right corner.

Figure 6.7 Select Gateway from List

6.12 PAIRING EACH DEVICE WITH THE SYSTEM'S GATEWAY

When the 'Sites' tab is clicked on the main window menu and then the 'System' tab, a list of paired devices is displayed with their information and status. Initially, this page is empty and the user must add the devices.

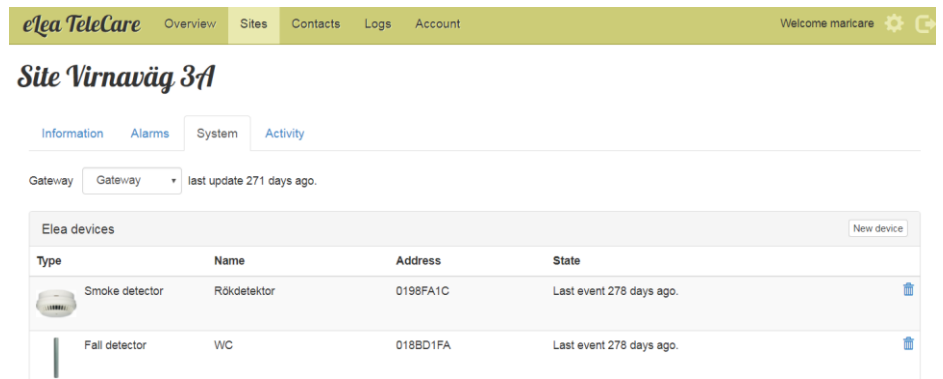


Figure 6.8 Pairing the eLeaTM System Devices

The 'System' page columns are

- **Type:**
This column shows the type of device with its accompanying icon that is paired with the gateway
- **Name:**
This column shows the name of the device
- **Address:**
This column shows the address of the device. Each device has a unique address.
- **State:**
This column shows the last time the server has gotten a message from the device

To edit the information on the pairing of an eLeaTM device with the gateway, double click on the row containing the eLeaTM device's information. This will display the 'Edit device' dialogue window and the information can be modified.

Similarly, to add a eLea™ device (i.e. pair a device with the Gateway):

- Click on the 'New device' button, which will display an empty 'Edit device' dialogue window

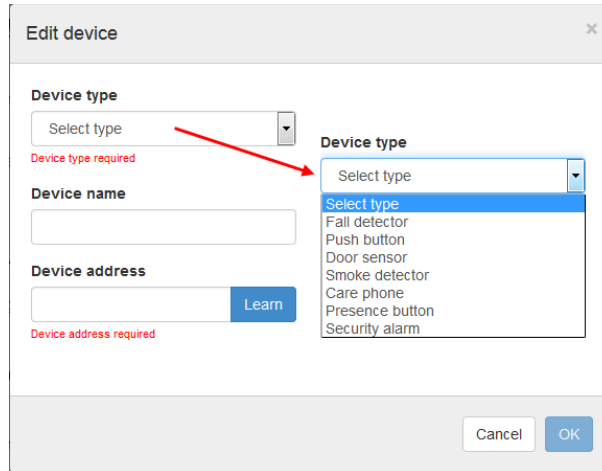


Figure 6.9 Edit (and Add) Device Dialogue Window

- Click on the 'Device type' field down-arrow and select the type of device from the 'Select type' dropdown list

Note: When a device type is selected, the accompanying icon will then be displayed on the 'Elea devices' list and also on the right of the 'Edit device' dialogue window. See Figure 6.

- Type in the name of the device in the 'Device name' field
- Click on the 'Learn' button on the right of the 'Device address'. You must have the device you are adding at hand at this point. Depending on the device, click on the Learn or Link switch on the device you are adding. In case you are adding a simple switch, press the switch once. A device address should appear on the screen as in Figure 6..
- When the information is correct, click the 'OK' button

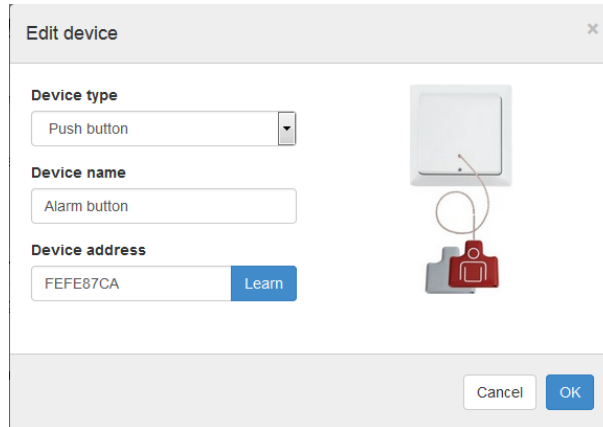


Figure 6.10 Example of a Paired Device

6.13 CONFIGURING ALARM RULES

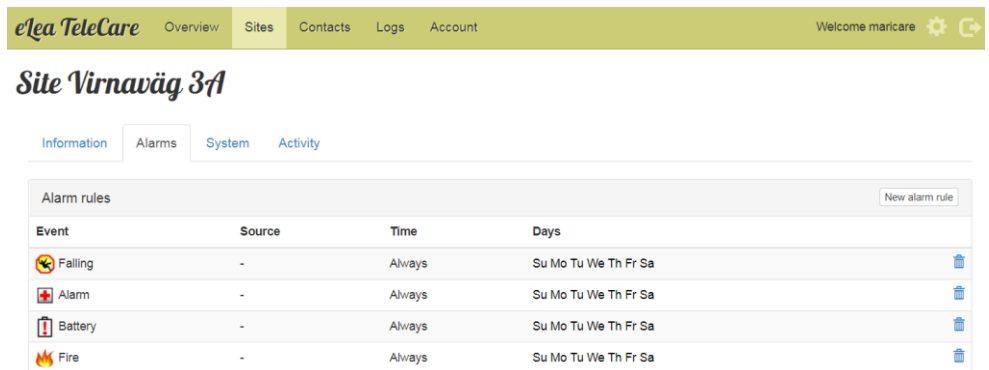


Figure 6.11 eLea™ System Alarms' Information & Status

When the “Alarms” tab is clicked in the ‘Sites’ window, a list of alarms with their information and status are displayed.

The ‘Alarms’ page columns are

- **Events:**
This column shows the event alarm with its accompanying icon. See Figure 6.
- **Source:**
This column shows the name of the device from which the alarm comes from or hyphen (-) for all devices.
- **Time:**
This column shows the period in the day when the alarm is active

- **Days:**
This column shows on which days the alarm is active

To edit an alarm rule, double click on the row containing the alarm information, which will display the 'Edit alarm rule' dialogue window.

Similarly to add an alarm rule, click on the 'New alarm rule' button, which will display an empty 'Edit alarm rule' dialogue window.

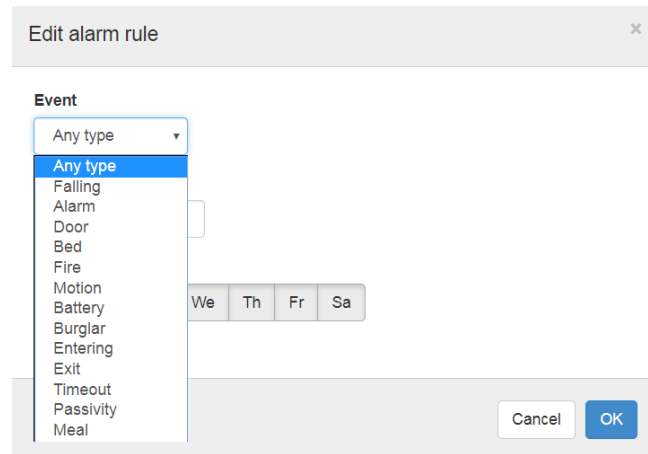


Figure 6.12 Edit Alarm Rule Dialogue Window

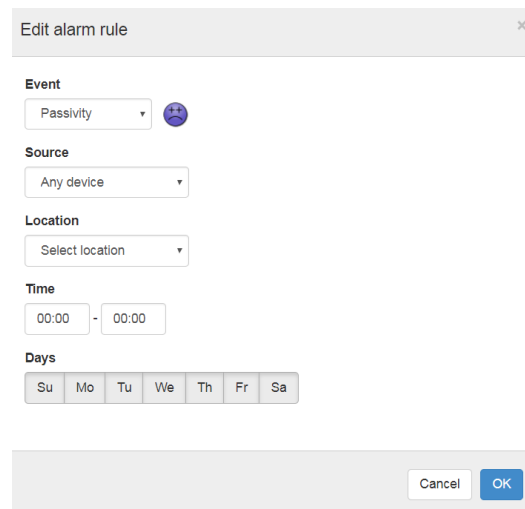


Figure 6.13 Edit Alarm Rule per source and/or location

To edit or add an alarm rule:

- Click on the 'Event' field down-arrow and select the type of event from the dropdown list. See Figure 6..



Figure 6.14 'Source' Dropdown List

- Click on the 'Source' field down-arrow and select the name of device from the dropdown list or select 'Any device'. See figure 6.14.
- Type in the active time of the alarm in the 'Time' fields. By default, the alarm is always active.
- Select the day or days the alarm is active by selecting the day(s). By default the alarm is active every day.
- When the information is correct, click the 'OK' button

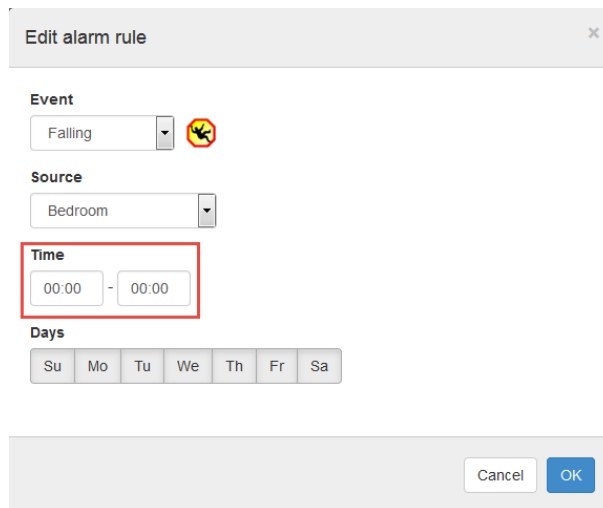


Figure 6.15 Example of an Alarm Rule

6.14 ALARM ICONS

To quickly catch the carer's eye, each alarm is accompanied by a colourful and distinctive icon.



Figure 6.16 Alarms with their Accompanying Icons

6.15 ALARM RECIPIENTS

When the 'Contacts' tab is clicked on the main window menu, a list of alarm recipients (viz. carers that are on-call) and their information and status are displayed. See *Figure 6.5* *Figure 6.57* *Lea™ System Recipients' Information & Status*

To edit or add a recipient's contact information:

- Double click on the row containing the recipient's information, which will display the 'Edit contact' dialogue window'

or

similarly, to add a recipient, click on the 'New recipient' button, which will display an empty 'Edit contact' dialogue window.

Figure 6.17 Edit Contact Dialogue Window

- In both cases, select the delivery method and fill out or modify the Name and Address or Number fields.
- When the information is correct, click the 'Save' button

7.ACTIVITY INDICATORS



The activity tab allows the configuration of the activity indicators. The system supports the following indicators:

- General motion
- Toilet visits
- Bedroom time
- Outdoors time

Each indicator can be configured with high and low limits. When the value crosses these limits an activity alarm is triggered.

Each indicator is updated once per day at 12:00 (site local time).

The graphs contain activity data from the last 2 months for toilet visit, bedroom time and outdoors time indicators. The general motion graph has data from the last 6 months.

General motion, bedroom time and outdoors time graphs have a dotted moving average line computed from the last 30 days. The high and low limits are specified in terms of percentiles of the distribution of the values over the last 30 days.

Toilet visit limits are specified as absolute values.

8. APPENDICES

8.1 TYPES OF eLea™ SMART DETECTORS

- FD05R: Wireless with rechargeable battery
- FD05R9V: Wireless with replaceable 9V battery
- FD05CR: External power (cable), wireless transmission and no battery

8.2 ABBREVIATIONS

PIR (Passive Infrared Sensor) is an electronic sensor that measures infra-red (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors.

PoE (Power over Ethernet) unit passes electrical power along with data on Ethernet cabling.

RSSI (Received Signal Strength Indicator) is a common name for the signal strength in wireless network environments. RSSI is a measure of the power level that a radio frequency client device is receiving from an access point.

DHCP (Dynamic Host Configuration Protocol) automatically provides an Internet Protocol (IP) host with its IP address and other related configuration information such as the subnet mask and default gateway.

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