Installation and User Guide

SafeBed™ and SafeSeat™
Bed / Seat Occupancy Monitor

User's Manual with Operation and Installation Instructions and Warranty Terms

WARNING! MUST NOT BE USED IN SITUATIONS WHERE A MALFUNCTION OR A LATENT DESIGN FLAW IN THE PRODUCT COULD LEAD TO A DELAY IN DELIVERY OF APPROPRIATE MEDICAL CARE OR THAT WOULD LIKELY LEAD TO A POTENTIALLY LIFE THREATENING SITUATION

Applicable model numbers:
Control Unit D-1070-2G
Under Mattress Bed Sensor L-4060SL
Seat Sensor L-3030SL

29 September 2010, t46 v1.1.5

IMPORTANT SAFETY PRECAUTIONS

- Read instructions prior to use
- Always test the system per instructions prior to use
- This product may not be suitable for all persons
- This product should not be a substitute for the routine visual monitoring protocol by caregiver
- Must not be used in situations where a delay in the arrival of appropriate medical care, could lead to a potentially life-threatening situation
- Never use Emfit sensors with other manufacturers' devices
- The notification may fail to sound if the sensor or its cable is damaged or the sensor is improperly positioned
- Pets can cause false notifications or may cause the device not to trigger notification
- Sensor must not be scratched, slit or cut
- Check sensor and cable condition as well as total use time at least weekly and replace when necessary
- Do not integrate to other systems other than those specified in this manual
- To avoid risk of electrical shock, avoid getting the sensor system wet
- Do not open the parts or attempt to repair it yourself
- Always keep the control unit and sensor dry. Exposure to excessive moisture can cause it to malfunction
- The product fulfils the requirements of the EMC-Directive for medical devices. It does not cause electromagnetic disturbances under normal working conditions
- The product can be stacked or placed near other products or devices as long as mechanical vibration is not present
- Always check the function of the product after making adjustments
- Please remove batteries if the unit is to be out of use or stored for an extended period of time

ACCIDENTAL OR INTENTIONAL ADJUSTMENT OF KNOBS AND SWITCHES BY THE USER OR SUBJECT MAY CAUSE:

- ...the notification sound to not activate when adjusting the volume control to the off position.
- ...false notifications (increasing) or malfunction (decrease) when adjusting the sensitivity.
- ...the product not to give notifications when necessary if turned off by pressing the SW1 switch.
- ...the product not to give notifications when necessary when switching DIP switches.

DANGER NOTES

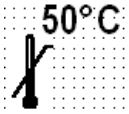
The following notes are provided for BOTH your personal safety and to protect the described product or attached devices from damage.

Safety notes and warnings for the prevention of danger to the lives and health of users or maintenance personnel and/or for the avoidance of damage to property are emphasised in these instructions by the pictograms defined here. The pictograms used have the following meanings for these instructions:

Means that death, serious personal injury or substantial damage to property can occur if the appropriate precautionary measures are not taken.

Means important information about the product or a part of the instructions that particular attention should be paid to.

OTHER SYMBOLS USED



Upper storage temperature limit

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1. GENERAL INFORMATION

1.1 Intended Use

The Emfit SafeBed™ Bed and Seat Occupancy Monitor (device model D-1070-2G and sensor model L-4060SL or L-3030SL) is intended to be used for a person with Alzheimer's or dementia, for notifying the caregiver in the event that the person has left the bed or seat or has not returned to it within a predefined time. The product consists of a bed or seat sensor and a control unit. The control unit has an audible notification sound and a dry-contact output for connecting it to the other parts of the system.

1.2 Control Unit

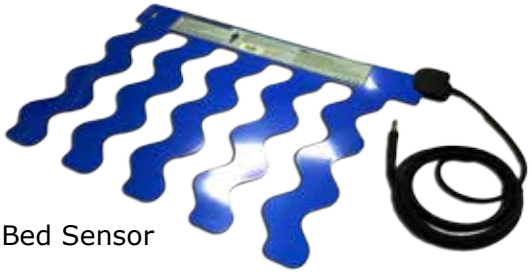
The control unit D-1070-2G activates after it has noticed movements or micro- movements, such as those caused by respiratory movements or the heart beating, for over 30 seconds. Notification is triggered if no movements or micro-movements are detected for at least 3 seconds (or 5 seconds, adjustable by DIP switch, see "3.1 Table of DIP Switch Setting" on page 5 switch #3).

The control unit processes a low voltage (from about 1 mV up to about 1 V), high impedance signal from the dynamic, quasi-piezoelectric type (i.e. self-biased) flexible film-like sensor. The control unit operates with 2 pcs AA size 1.5 V alkaline batteries. An optional AC adapter is available (5 V DC). AC ADAPTERS OTHER THAN ORIGINAL ACCESSORIES FROM EMFIT MUST NOT BE USED.

The control unit has input connectors for the sensor (marked as X3) and optional AC adapter (marked as X1). There is also a connector marked as X2 for connecting the device to other systems for transferring the notification via dry-contact optocoupler. A reset switch for turning off the notification sound is to the right of the sensor input (marked as SW1). Inside the device there is a place for 2 standard AA size 1.5 V alkaline batteries, and mini-switches (DIP and rotary) for program settings.

1.3 Sensor

The Emfit under-mattress bed sensor model L-4060SL is a quasi-piezoelectric, dynamic sensor that has no embedded wires or switches. This specially formulated plastic sheet sensor is placed under the mattress at approximately chest height. The waves of the sensor should run head to foot parallel to the patient. Seat L-303SL is similar, just smaller with shorter cord. See pictures to the right.



Bed Sensor

The sensor produces signals from even the slightest micro-movements created when a person is in bed or on a seat. When there is no movement, it recognizes this as the individual being absent and it gives a notification both by sound and via dry-contact optocoupler. There are no particular size or weight limitations, but sensitivity and the ability to recognize a user's micro-movements and thus, presence in bed, need to be tested in each case.

Seat Sensor

2. PACKAGE CONTENTS

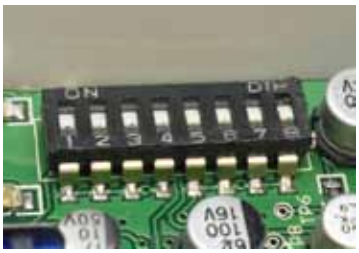
- Control unit
- Bed or seat sensor
- Wall mounting clip
- 2 screws
- 2 locking anchors
- This user manual
- Power supply (Sold separately)

3. BASIC SETTINGS

Be sure to set the DIP switches to their desired settings before using. The Control Unit comes with the following factory default settings.

Always remove the batteries and unplug the AC adapter (if using) before making changes to the DIP switch positions. If all sources of power are not removed the new settings will not take effect!

- Shortest time delay (3 or 5 seconds)
- Normal sensitivity for noticing micro-movements (best for use when sensor is installed below foam mattress or mattress pad
- Output is in pulse mode (about 1.5 second pulse)
- Power switch enabled (press power switch labelled SW1 for about 3 seconds to turn the control unit on and off)
- Alarm Volume VERY LOUD



Inside the device there is a DIP switch with 8 small switches. These are used for various program settings.

See the following table and set up the switches in your preferred way.

To open the device cover, see the picture above right.

3.1 Table of DIP Switch Setting

DIP #	OFF (down)	ON (up)
#1	Notification time delay setting, see "3.2 Setting the Notification Time Delay" on page 6	Notification time delay setting, see "3.2 Setting the Notification Time Delay" on page 6
#2	Notification time delay setting, see "3.2 Setting the Notification Time Delay" on page 6	Notification time delay setting, see "3.2 Setting the Notification Time Delay" on page 6
#3	Notification time delay setting, see "3.2 Setting the Notification Time Delay" on page 6	Notification time delay setting, see "3.2 Setting the Notification Time Delay" on page 6
#4	Normal sensitivity for noticing micro-movements; use when sensor is installed below foam mattress or mattress pad	Increased sensitivity for noticing micro-movements. Recommended use only when sensor needs to be installed below spring mattress (no mattress pad in use). NOTE! Consumes more power and shortens battery life! Blue light blinks slightly faster.
#5	Dry-contact output is pulse mode (about 1,5 sec pulse)	Dry-contact output is constant type. Use only when necessary by other system to be connected with. Not to be used with batteries! Only with optional power supply due increased power consumption.
#6	Power switch function at SW1 is enabled (device can be shut down and turned on by pressing SW1 for about 3 seconds)	Power switch function at SW1 disabled (device is always on).
#7	Notification sound volume setting, see "3.3 Setting the Notification Sound Volume" on page 6	Notification sound volume setting, see "3.3 Setting the Notification Sound Volume" on page 6
#8	Notification sound volume setting, see "3.3 Setting the Notification Sound Volume" on page 6	Notification sound volume setting, see "3.3 Setting the Notification Sound Volume" on page 6

3.2 Setting the Notification Time Delay

Time Delay	Switch # 1	Switch #2	Switch #3
Shortest (3 or 5 sec)	OFF (down)	OFF (down)	OFF (down)
5-7 seconds	OFF (down)	ON (up)	OFF (down)
3 minutes	ON (up)	ON (up)	OFF (down)
6 minutes	OFF (down)	OFF (down)	ON (up)
10 minutes	ON (up)	OFF (down)	ON (up)
15 minutes	OFF (down)	ON (up)	ON (up)
30 minutes	ON (up)	ON (up)	ON (up)

3.3 Setting the Notification Sound Volume

The notification sound is useful only when caregiver is in close proximity to the control unit. The volume can be adjusted at 4 levels: no sound, quiet, loud, and very loud.

Volume level	Switch # 7	Switch #8
Very Loud	OFF (down)	OFF (down)
Loud	ON (up)	OFF (down)
Quiet	OFF (down)	ON (up)
No sound / mute	ON (up)	ON (up)

The sound stops when both the reset switch is pressed and when the event is over. In case of person's absence from the bed, the sound will stop once person has returned or reset is pressed.

4. SETTING THE SENSITIVITY

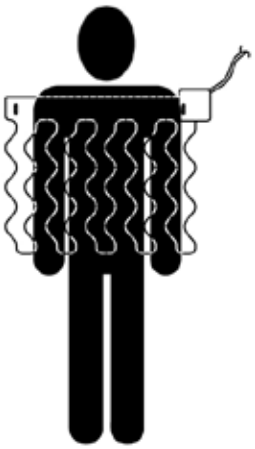
Sensitivity is adjusted automatically. Make sure the power is switched on (turn on by holding power button (SW1) until the lights come on). Ask a person to lie in the bed and be still as though sleeping. Wait for about 10 seconds and then press the SW1 switch 3 times. Device gives 3 short beeping sounds. After the device monitors the persons micro movements caused by the heart beating and respiration (about 15 seconds) it adjusts the sensitivity to the proper level. When setting is done, the device will give three times high tone "beeping" sounds.

In case the sensitivity cannot be adjusted automatically, the device will give a different sound after the 15 seconds; 1) If it gives one low tone "beep" sound, adjust the rotary switch one step higher and perform the automatic setting again or 2) if after a setting period of 15 seconds the device gives two "beep" sounds, adjust the rotary switch one step lower and perform the automatic adjustment again.

Always perform the automatic sensitivity test after changing system to another kind of bed, or after changing the sensor. The persons weight does not significantly affect the need of sensitivity adjustment. Only if persons weight changes greatly like i.e. from a heavy adult to a very light person, it may be necessary to perform the sensitivity adjustment accordingly.

5. INSTALLING THE SENSOR

5.1 Bed Sensor



- Place the sensor under the mattress at approximately chest height. The waves of the sensor should run head to foot parallel to the patient. See picture on the right.
- Check that the sensor is in the correct position at least once a week. Shifting can occur during normal use.
- If you use the sensor on a spring mattress, place the sensor between the mattress pad and the spring mattress.
- If the bed has a spring mattress, without mattress pad, and a box or a spring box below a spring mattress, the sensor can be installed between the spring mattress and the box. In that case install a durable, 2-3 mm thick plastic or plywood sheet on top and below the sensor to avoid the springs damaging the sensor. A thin soft cushion between the sheets and the sensor is preferred. Set DIP switch #4 to the up position.
- If the bed has a spring mattress, place the sensor between the mattress and a mattress pad. Never place the sensor right below the blanket or in direct contact with the person. The Emfit bed sensor is designed to withstand 2 years of use below a foam mattress, against a hard bed bottom. The manufacturer recommends replacing the bed sensor after 2 years of use.
- When used on a spring mattress, the use time is much shorter due to increased wear and tear. When placed on a spring mattress the sensor experiences much more bending and flexing with every movement; this causes wrinkles in the sensor and may cause it to stop working properly. The manufacturer recommends replacing the bed sensor whenever it looks worn out with many wrinkles and latest after 1 year use on a spring mattress. ***The warranty does not apply if sensor is damaged due to wear and tear.***
- Do not use with Anti-Decubitus Mattresses (used for preventing bed-sores), where air pressure is controlled with a compressor. This will cause false readings.

5.2 Seat Sensor

- Place the sensor under the seat cushion.
- Check that the sensor is in the correct position at least once a week. Shifting can occur during normal use.
- Never place the sensor right below a blanket or in direct contact with the person. The Emfit bed sensor is designed to withstand 2 years of use below a seat cushion, against a hard base. The manufacturer recommends replacing the seat sensor after 2 years of use.
- The manufacturer recommends replacing the seat sensor whenever it looks worn out with many wrinkles. ***The warranty does not apply if sensor is damaged due to wear and tear.***

6. CONNECTORS AND WIRING

Connect the sensor, power supply (sold separately) and any additional cables in the following way:

		
Connect the sensor to input X3	It's possible to attach another system to the control unit via input X2 (i.e. Nurse call system)	The power supply (sold separately) fits into input X1.

Connectors are marked with X1, X2 and X3. These are:

⚠ X1 - Power supply connector. Use only GlobTek Inc. power supply, model no: GTM41060-1505 and P/N:WR9QA3000LCP-N-MNK, available as original accessory from Emfit.

⚠ X2 - AUX connector for connecting the device to some other system (cable not included) for transferring the notification via a dry-contact optocoupler. DRY-CONTACT OUTPUT OF THE X2 (AUX) CONNECTOR CAN ONLY BE CONNECTED TO A SYSTEM SAFETY VOLTAGE INPUT WITH MAX VOLTAGE BELOW 25V (AC) / 60V (DC), WHERE BOTH POLES HAVE BEEN SEPARATED FROM THE ELECTRICAL NETWORK (SO CALLED FLOATING APPLIED PART). MAX LOAD CURRENT 100 mA!

⚠ X3 - Sensor connector (use only Emfit bed sensor model L-4060SL or seat sensor model L-303SL)

6.1 X2 (AUX) Connector Pin Order

From left to right:

Pin #1	Common return
Pin #2	Normally Open (NO) send
Pin #3	Normally Closed (NC) send
Pin #4	Low Battery send
Pin #5	Not in use, do not connect
Pin #6	Not in use, do not connect
Pin #7	Not in use, do not connect
Pin #8	Not in use, do not connect

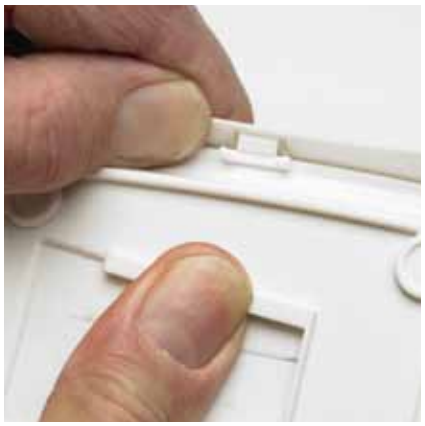
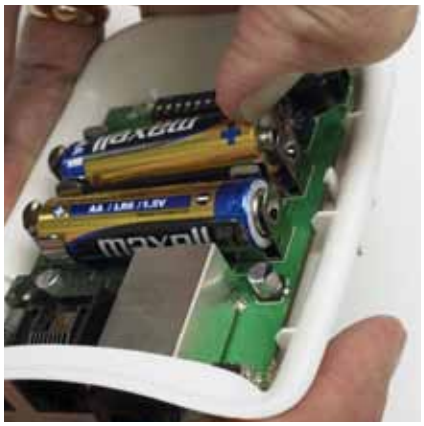
⚠ Dry-contact output of the X2 (AUX) connector can only be connect to a system safety voltage input with max voltage below 25V (AC) / 60V (DC), where both poles have been separated from the electrical network (so called floating applied part)! Max load current is 100mA.

7. INSTALLING THE WALL MOUNT AND THE DEVICE INTO IT

		
Attach the wall mount with the included two anchors and screws	Slide the device into the mount	Press the device downwards so you hear a "click" sound

8. INSTALLING BATTERIES AND BATTERY CONSUMPTION

Product operates with 2 pcs AA size 1.5 V alkaline batteries. Install and remove the batteries as follows:

		
Open the cover by lifting from one side	Install 2 pcs good quality AA size 1,5 V alkaline batteries according the polarity drawings on the circuit board	When removing old batteries, they are easiest to remove by lifting from positive (+) ends

Estimated battery life is 6 months, when using high quality alkaline batteries, with 2800 mAh capacity (2pcs). Estimation is based on measured battery consumption in various conditions and then a calculation where device is on 50% of time (shut down 50% of time) and of that 50% of time there is someone in bed 75% of that time, there is two notifications per day and sound notification is on 30 seconds each time.

When the batteries are getting low, the red LED will begin to flash slowly. A "beep" sound will be heard after every 1.5 hours and the dry-contact output will give a low battery notification after every 3 hours.

We recommend that the batteries be removed if the control unit is to be stored or unused for extended periods of time.

9. ABOUT THE OPTIONAL 5V ADAPTER

For preparing the optional power supply in use, do the following:

		
Remove the plastic cover	Pick up suitable adapter from the included 4 pcs	Install the adapter and make sure it stays in its place

⚠ The Emfit SAFEBED BED / seat OCCUPANCY MONITOR is designed and tested to be used only with GlobTek Inc. power supply model: no GTM41060-1505 AND P/N:WR9QA3000LCP-N-MNK. Any other type OF AC ADAPTER may affect the product's safety.

The power supply is equipped with a blue indicator light; when the light is on the power supply is in use. If the light is off and the power supply is connected to the mains outlet, the power supply is probably damaged and should be replaced.

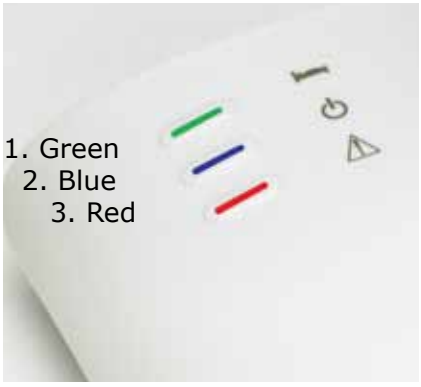
ℹ When the AC adapter is connected to the power input (X1), the batteries will operate as a back up power supply in case of power failure. Note that all batteries drain and eventually empty over time. Therefore replace back-up batteries latest every second year. The low battery warming does not operate when the power supply is connected. To test the batteries, unplug the power supply cord from X1. If the red LED lights up, replace the batteries.

10. LED-LIGHT INDICATORS

1. Green LED / Presence

The green light starts blinking slowly (half the speed of blued led) when the device notices micro or other movements (person goes to bed / seat)

- The green light starts blinking same speed as blue light when the device has noticed micro and/or other movements (person in bed) for 40 seconds and it activates for presence monitoring. Device also gives a short "beep" sound.
- The green light blinks every 4th time of the blue light after it has triggered no movement notification, until SW1 is pressed shortly or there are again movements or micro movements (person has returned to the bed) for at least 40 seconds.



2. Blue LED / Power ON - Standby

- The blue light blinks slowly when the device is ON
- The blue light blinks fast for a short moment when the device triggers a notification

3. Red LED / Fault

- The red light will blink quickly when the sensor is not connected or is broken. A notification sound is heard the first time 10 seconds after the device notices a sensor fault, and thereafter every 45 seconds. Dry-contact output gives notification the first time after 30 seconds and thereafter every 30 minutes, until proper sensor is plugged.

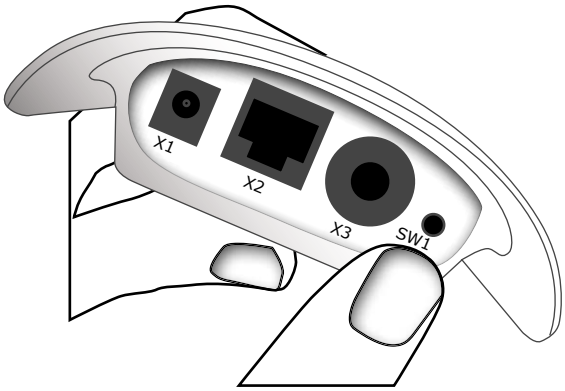
- A slowly blinking red light means it's time to replace the batteries. A notification sound is given after every 1 ½ hours and dry-contact output gives low battery notification after every 3 hours until batteries are replaced.

11. SW1 - RESET SWITCH / ON-OFF SWITCH

11.1 SW-1 As Reset Switch

When the notification sound is ongoing it can be silenced by pressing the SW1 switch briefly (see picture).

When person returns to the bed the sound stops also automatically within a few seconds.



11.2 SW-1 As On-Off Switch

When the ON-OFF switch function is enabled from DIP-switch #6, the SW1 switch functions also as ON-OFF switch. To turn the device ON or OFF, just press the switch SW1 for about 3 seconds.

12. TESTING AND INSPECTIONS

12.1 Weekly Inspection

1. Inspect that all cables and connections are in good condition.

2. Check that the sensor is positioned correctly below the chest.

12.2 Tests When Upon First Use and then Every Month

Do the following tests to ensure the systems proper operation when using the first time and then at least once a month!

12.3 Testing the absence i.e. no movements notification

1. Check that the device is on (blue light is blinking). If longer delay (15, 30 or 60 minutes) is in use, change that to shortest. See "3.1 Table of DIP Switch Setting" on page 5.

2. If using the bed sensor have the person lie still on the bed on his/her right side for at least 2 minutes. If using the seat sensor have the person sit quietly in the chair. The system should notice person's micro movements immediately and the green occupancy LED indicator will start to blink. At first it blinks every second time the blue light blinks. Then after 30 seconds the blue light blinks fast for a few seconds and device gives a short "beep" sound as a sign that device is activated for presence monitoring. After that the green LED should blink continuously the entire time person is in bed. If the device does not detect the presence of a person (green LED light is not blinking) move to 13. troubleshooting. If the green light goes off for long periods of time and the no movement notification is triggered, adjust sensitivity higher (see "4. Setting the sensitivity" on page 6). If the green light blinks continuously, while the person is laying still on their right side, the sensitivity level is correct.

3. Now ask the person to leave the bed or seat. The 'no movement' notification should be triggered after the delay time (3 or 5 seconds, "3.1 Table of DIP Switch Setting" on page 5. switch #3), when the person has left the bed and no one is touching the bed, sensor or wires. If the notification doesn't work and the green light continues blinking, see "13. Troubleshooting" on page 12.

13. TROUBLESHOOTING

Always check first that the installation is correct and test the device properly after every adjustment.

Notification is not getting forward via other system the device is connected to:	• Check that the connection cable is connected correctly and is in good condition. Often both ends of the wire use same connector but wiring order is not the same. Make sure it is connected the right way!
Notification sound does not operate:	• Check the volume level.
False notifications without reason:	• Check the condition, positioning and connection of the bed sensor. • Check the sensitivity according to "4. Setting the sensitivity" on page 6. It may be that sensitivity is not set properly and device cannot always notice micro-movements.
The device does not trigger absence i.e. no movements notification and the green light is blinking even if there is no one on the bed	• Check for possible external disturbances on the bed sensor and its cable. Remove any external disturbances causing vibrations. • Check the sensor and its cable. A broken sensor or cable may cause disturbances to the signal so that the green light blinks all the time. Usually this is detected by the device itself and red light starts blinking. Also, sensor cable should be away from any main outlet cables and should not be hooked to the AC adapter cable. • If the cable and the sensor seem to be in order, try reducing the sensitivity as some external vibrations may cause this. See "4. Setting the sensitivity" on page 6.
The device does not trigger absence i.e. no movement notification and the green light is off when there is no one on the bed:	• Is the green light blinking when there is someone in bed? If not, check the sensor and its cable. • Check that the device is switched ON. It is ON if the blue LED light is blinking slowly. If it is not blinking, press the SW1 switch for 3 seconds. • Check the sensitivity setting of the device when a person remains still on the bed. Green light should be blinking and system should activate after person has been in bed for 40 seconds. If necessary increase the sensitivity (see "4. Setting the sensitivity" on page 6).

Please never hesitate to contact the manufacturer if you need help or have feedback! All feedback is highly appreciated!

14. CLEANING

The bed sensor can be cleaned with water and, when necessary, neutral general-purpose or mild antiseptic detergents. Always dry the sensor after cleaning. Use a moist cloth for cleaning the control unit.

⚠ The control unit must not get wet! Do not clean the AC adapter or the control unit when it is connected to the mains outlet. Always dry it well after cleaning.

15. MATERIALS DISPOSAL

At the end of the product's use life, please dispose of it at appropriate collection points provided in your country. For disposal or recycling information, please contact your local authorities or the Electronic Industries Alliance (EIA, www.eiae.org).

In the European Union, this label indicates that this product should not be disposed of with household waste. It should be deposited at an appropriate facility to enable recovery and recycling.

16. DECLARATION OF CONFORMITY (EU)

Emfit SafeBed (device model D-1070-2G with bed sensor model L-4060SL or with seat sensor L-303SL) complies with the essential requirements of EMC directive 2004/108/EC, CE mark directive 93/68/EEC and Medical Device Directive 93/42/EC and carries the CE marking accordingly.

17. EMFIT LIMITED WARRANTY STATEMENT

In the unlikely event that your product needs guarantee service, please contact your dealer, distributor or manufacturer. To avoid any unnecessary inconvenience on your part, we recommend you read this instruction manual carefully before seeking guarantee service.

YOUR GUARANTEE

By this Guarantee, Emfit guarantees the product to be free from defects in materials and workmanship at the date of original purchase for a period of two (2) years from that date.

If within the guarantee period the product is determined to be defective (at the date of original purchase) due to improper materials or workmanship, Emfit will, without charge for labour or parts, repair or (at Emfit's discretion) replace the product or its defective parts subject to the terms and limitations below. Emfit may replace defective products or parts with new or refurbished products or parts. All products and parts replaced become the property of Emfit.

TERMS

Guarantee services will be provided only if the original invoice or sales receipt (indicating the date of purchase, model name and dealer's name) is presented with the defective product within the guarantee period. Emfit may refuse free-of-charge guarantee service if these documents are not presented or if they are incomplete or illegible. This Guarantee will not apply if the model name or serial number on the product has been altered, deleted, removed or made illegible.

This Guarantee does not cover transport costs and risks associated with transport of your product to and from Emfit.

This Guarantee does not cover:

a) periodic maintenance and repair or parts replacement due to wear and tear. Notice! Emfit bed-sensor wears and tears significantly faster when installed on soft base like spring mattress

b) consumables (components that are expected to require periodic replacement during the lifetime of a product such as non-rechargeable batteries)

c) damage or defects caused by use, operation or treatment of the product inconsistent with normal use

d) damage or changes to the product as a result of:

i. Misuse, including:

- Treatment resulting in physical, cosmetic or surface damage or changes to the product
- Failure to install or use the product for its normal purpose or in accordance with Emfit's instructions on installation or use
- Failure to maintain the product in accordance with Emfit's instructions on proper maintenance
- Installation or use of the product in a manner inconsistent with the technical or safety laws or

standards in the country where it is installed or used

ii. The condition of or defects in systems with which the product is used or incorporated except other Emfit's products designed to be used with the product

iii. Use of the product with accessories, peripheral equipment and other products of a type, condition and standard other than prescribed by Emfit

iv. Repair or attempted repair by persons who are not Emfit employees

v. Adjustments or adaptations without Emfit's prior written consent, including:

- Upgrading the product beyond specifications or features described in the instruction manual, or
- Modifications to the product to conform it to national or local technical or safety standards in countries other than those for which the product was specifically designed and manufactured

vi. Neglect

vii. Accidents, fire, liquids, chemicals, other substances, flooding, vibrations, excessive heat, improper ventilation, power surges, excess or incorrect supply or input voltage, radiation, electrostatic discharges including lighting, other external forces and impacts.

This guarantee covers only hardware components of the product.

Exclusions and limitations

EXCEPT AS STATED ABOVE, EMFIT MAKES NO WARRANTIES (EXPRESS, IMPLIED, STATUTORY OR OTHERWISE) REGARDING PRODUCT OR ACCOMPANYING OR CONSTITUENT SOFTWARE QUALITY, PERFORMANCE, ACCURACY, RELIABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. If this exclusion is not permitted or fully permitted by applicable law, Emfit excludes or limits its warranties only to the maximum extent permitted by applicable law. Any warranty that cannot be fully excluded will be limited (as far as permitted by applicable law) to the duration of this Guarantee.

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18. TECHNICAL SPECIFICATIONS

Control Unit

Model:	D-1070-2G
Operating voltage:	5 V DC
Input / output connectors:	Power, AUX and Sensor
Dry-contact outputs:	Max. 100 mA, <60 V DC, <25 V DC
Switches and controls:	On/Off/Reset switch, 8 DIP switches for program settings, 1 pcs 10 position rotary switch for sensitivity adjustment
Light indicators:	3 LEDs
Notification delays:	Absence i.e. no movements threshold delay 5 sec., 10 sec., 15 min, 30 min, 60 min
Mounting:	On the wall with included bracket or on the table
Dimensions mm:	96 x 127 x 34 mm
Weight:	110 g
Colour:	White
Enclosure protection:	IP20
Case:	Plastic

Sensor

Model:	L-4060SL or L-303SL
Type:	Bed sensor or seat sensor
Placing:	Under the mattress or under seat cushion
Portability:	Yes
Dimension mm (L x W):	Bed sensor 400 x 580 mm, seat sensor 290 x 300 mm
Thickness:	0,4 mm
Weight:	110 g
Colour:	Blue / grey
Surface material:	Polyester
Cable length:	3m / 1,5 m

Environmental conditions

Operating temperature:	10°C TO 40°C
Storage and transportation Temperature:	-30°C TO 50°C
Humidity:	20%… 75% Relative humidity

Product classification

93/42/EEC	Medical device class **1**
Electrical safety:	Class **II** equipment
Enclosure protection:	IP20

19. ELECTROMAGNETIC CONDITIONS

System specification:

- D-1070-2G monitor
- L-4060SL bed sensor or Seat Sensor L-3030SL
- GlobTek power supply model: no GTM41060-1505 and P/N:WR9QA3000LCP-N-MNK.

Cable specification:

- Power cable (non-shielded) max. Length 2 m
- Sensor cable (shielded) max. length 3 m

Note! RF communications equipment can effect medical electrical equipment!

Electromagnetic emissions		
The Emfit SafeBed Bed / Seat Occupancy Monitor is intended for use in the electromagnetic environment specified below. The customer or the user of the equipment should assure that it is used in such an environment.		
RF emissions CISPR 11	Group 1	The Emfit SafeBed Bed / Seat Occupancy Monitor uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The Emfit SafeBed Bed / Seat Occupancy Monitor is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Electromagnetic immunity			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment**
Electrostatic discharge (ESD) IEC 61000-4-2	±6 kV contact ±8 kV air	IEC-60601-1-2 test level	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines ±1 kV for input/output lines	IEC-60601-1-2 test level	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±1 kV line(s) to line(s)	IEC-60601-1-2 test level	Mains power quality should be that of a typical commercial or hospital environment
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95 % dip in U_T) for 0,5 cycle 40 % U_T (60 % dip in U_T) for 5 cycles 70 % U_T (30 % dip in U_T) for 25 cycles <5 % U_T (>95 % dip in U_T) for 5 sec	IEC-60601-1-2 test level	Mains power quality should be that of a typical commercial or hospital environment. If the user of the The Emfit SafeBed Bed / Seat Occupancy Monitor enquires continued operation during power mains interruptions, it is recommended that the Emfit SafeBed Bed / Seat Occupancy Monitor be powered from an uninterruptible power supply or battery
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	IEC-60601-1-2 test level	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE UT is the A/C mains voltage prior to application of the test level.			

Electromagnetic immunity

Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	[V_1] = 3 V 150 kHz to 80 MHz	Portable and mobile RF communications equipment should be used no closer to any part of the The Emfit SafeBed Bed / Seat Occupancy Monitor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = [\frac{3,5}{V_1}]\sqrt{P}$ $d = [\frac{3,5}{E_1}]\sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}]\sqrt{P}$ 800 MHz to 2,5 GHz Where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and *d* is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol: 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	[E_1] = 3 V/m 80 MHz to 2,5 GHz	

NOTE 1 At 80 MHz and 800 MHz, the higher frequency range applies.
NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

- Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the [EQUIPMENT or SYSTEM] is used exceeds the applicable RF compliance level above, the [EQUIPMENT or SYSTEM] should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the [EQUIPMENT or SYSTEM].

- Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [V_1] V/m.

Recommended separation distances between portable and mobile RF communications equipment and the [EQUIPMENT or SYSTEM]

The Emfit SafeBed Bed / Seat Occupancy Monitor is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Emfit SafeBed Bed / Seat Occupancy Monitor can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Emfit SafeBed Bed / Seat Occupancy Monitor alarm as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance according to frequency of transmitter**		
	150 kHz to 80 MHz $d = [\frac{3,5}{V_1}]\sqrt{P}$	**80 MHz to 800 MHz** $d = [\frac{3,5}{E_1}]\sqrt{P}$	**800 MHz to 2,5 GHz** $d = [\frac{7}{E_1}]\sqrt{P}$
0,01	0,12 m	0,12 m	0,23 m
0,1	0,37 m	0,37 m	0,73 m
1	1,17 m	1,17 m	2,33 m
10	3,69 m	3,69 m	7,38 m
100	11,67 m	11,67 m	23,33 m

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in metres (m) can be determined using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6,765 MHz to 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz.

NOTE 3 An additional factor of 10/3 is used in calculating the recommended separation distance for transmitters in the ISM frequency bands between 150 kHz and 80 MHz and in the frequency range 80 MHz to 2,5 GHz to decrease the likelihood that mobile/portable communications equipment could cause interference if it is inadvertently brought into patient areas.

NOTE 4 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

20. MANUFACTURER'S CONTACT INFORMATION

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