

Bed & Chair Occupancy Sensor

installation manual

Part Number: D4107045A

All the reassurance you need

Tunstall

Installation Manual Bed/Chair Occupancy Sensor

D4107045 Issue A

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The Sensor Module

This manual provides installation and setup information for Bed/ Chair Occupancy Sensor Equipment; part 41005/12

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QUICK GUIDE

SETTINGS RECORD

1 INTRODUCTION/ OUTLINE DESCRIPTION

The Tunstall Bed/Chair Occupancy Sensor is an advanced Telecare sensor for use with residents who may be at risk of falling when getting out of bed or out of a chair.

A sensor control unit is connected to sensors which determine bed or chair occupancy. This control unit is radio linked using the dedicated social alarm frequency (869.2125MHz) to compatible monitoring equipment. Should an alarm condition be present, an alarm is raised at the monitoring centre.

It should be noted that whilst having the facility to monitor both sides of a bed (using two pads either or both, will generate bed occupied), only one resident can be monitored.

Optional X10 (master) equipment can be connected to the control unit to remotely control mains powered equipment (e.g. light, via a slave) and thereby automatically turn on a light when a resident gets out of bed - reducing the risk of falls.

A Palm PDA device is used to programme the control unit - e.g. setting times during which the client ought to be in bed.

Before attempting to use a Bed/Chair Occupancy Sensor, it is recommended that this manual be read in its entirety.

2 EQUIPMENT LIST

2.1 Bed Occupancy Sensor System

Sensor control unit- 41005/12

Packed sensor control unit with batteries 41005/13

Bed sensor (1 per single bed, 2 potentially for double bed) S2010004

Chair Sensor S2010005

Within the boxed 41005/13 are user instructions D4107004A, which should be marked up with the personal times, set for the resident.

3 PROGRAMMING

3.1 PALM

A packed personal organiser (Palm PDA) containing this manual, a Palm and appropriate interconnecting leads is available under part number 41005/10.

This also contains the Tunstall configuration software SA1239 on CD

3.2 41005/22 TIM Service Kit for PC

A kit containing a bundled PALM emulator with TIM set-up software is available with a connecting cable that installs a working PALM emulator for a PC, which is installed using SETUP.EXE

4 COMPATIBLE ALARM RECEIVING EQUIPMENT

Lifeline 400

Lifeline 4000+

Telecare Overlay

(I.e. all 869MHz compatible)

PNC control centres will use TT92 protocol and default location meanings to convey the correct alarm conditions

5 REQUIREMENTS OF COMPATIBLE PERSONAL COMPUTER

(Necessary for loading the configuration software onto the palm via a docking station)

CD ROM drive

USB port (for connection of palm docking station)

6 OPTIONAL EQUIPMENT

X 10 controller/ master (boxed with lead) 41005/04

X 10 lamp module/ slave D4106002A

Extend switch 41005/05

7 GLOSSARY

Monitoring period: the times between which the resident should be in bed

Absence timer: the time for which a resident can be out of bed before an alarm would be raised

Extension time: the amount of time by which the absence time can be extended.

8 BED/CHAIR OCCUPANCY SENSOR FUNCTIONALITY

The following paragraphs describe the operation and possible configuration of the Occupancy sensor. The configurable times below will need to have been decided with the resident for the particular application.

Alarm conditions can be independently enabled or disabled.

All times are set up at installation using the Palm and are not user alterable

The Bed/Chair Occupancy Sensor is capable of generating the following alarm conditions:-

(**Note:** the resident must be in bed for at least a minute before the Bed/Chair Occupancy Sensor begins to detect alarm conditions. This is in order to reduce the probability of false alarms.)

8.1 Bed Absent Alarm

The device will raise an alarm if the resident has left the bed and not returned within a configurable allowable duration (during the monitoring period).

The following additional features are connected with this feature: -

- **Absence Timer:** the time the presence of a resident in bed is monitored. It is triggered when a resident is in bed for a minute between the start and finish of monitoring time. Format of hours and minutes.
- **Not in bed by Time:** the latest time for which a resident can be out of bed before an alarm would be raised. Format of hours and minutes.
- **Still in bed by Time:** the latest time for which a resident can be in bed before an alarm would be raised. Format of hours and minutes.
- **Extension Time:** Allows the resident to extend the duration of the absence timer. Pressing a button (optional Extend button) either before or after they have left the bed will add the extension time to the absence time. Note that multiple presses will not add multiple times.
- **Monitoring Period:** The time between which sensing is active. A start and stop time in 24 hour clock format. It is possible to make this always active. (24 hours)
- **X10 activity:** The X10 load (slave) is turned on a defined time prior to the monitoring start time and turned off a defined time after the monitoring end time. These time differences are adjustable from zero to up to 2 hours before or after the monitoring times. The slave is turned off when the resident is in bed- therefore it will turn on automatically when the resident gets out of bed.

8.2 Bed Unoccupied Alarm:

The device will raise an alarm if the resident is not in bed by this set time.

For example the resident should go to bed by 11pm every day; so the Bed Unoccupied alarm is set to 11pm. But during the week they go to bed between 9pm and 11pm, and hence the Absence Timer is set to 9pm. Earlier versions of software require both to be set to 11pm.

8.3 Bed Occupied Alarm:

The device will raise an alarm if the resident is not out of bed by this set time.

It is important to remember that the sensor will take one minute to recognise that the resident is in bed.

8.4 Automatic Battery Low Alarm

The device will raise an automatic alarm if a low battery condition is detected

9 BED/CHAIR OCCUPANCY SENSOR INSTALLATION

9.1 Connections

Up to 4 connections may be necessary. They are labelled IP1, IP2, IP3, IP4/Prog and X10 as shown in the following photograph.

IP1 is for the extend switch

IP2 and IP3 for bed or chair sensor pads- either or both may be used- see 9.5

IP4 for programming via the PDA

IP5 for X10

Any connections not used should be blanked off prior to power up. These blanking plugs are in place at time of shipment



FRONT PANEL OF SENSOR CONTROL UNIT

To plug a connector into these sockets, simply push the connector in until it clicks, or in the case of IP1, just push it in until it won't go any further. Gently pull on the lead to make sure that it doesn't come loose. To remove the connectors from all sockets other than IP1, push down on the plastic tab on the top of the connector (shown in the picture below) and gently pull the connector out of the socket. If it doesn't pull out, you're not pushing the tab down hard enough.

- To screw to the wall, fit the supplied feet one by one, using the enclosure fixing screws through the slotted hole. Ensure radio propagation is taken into consideration- do not mount onto a metal surface or close to metallic items.
- If an X10 Controller is fitted, then the SENSOR MODULE must be within range of a suitable mains socket.



Positioning of the Sensor control unit may require some thought and the following guidelines are appropriate: -

- Several cables connect to the sensor module e.g. bed panel, optional incontinence panel, X10 controller and it is important to ensure that the safety of the client is not compromised by trailing cables etc.
- If an X10 Controller is fitted, then the sensor module must be within range of a suitable mains power socket.

9.2 Bed and Chair Occupancy Sensing Panels

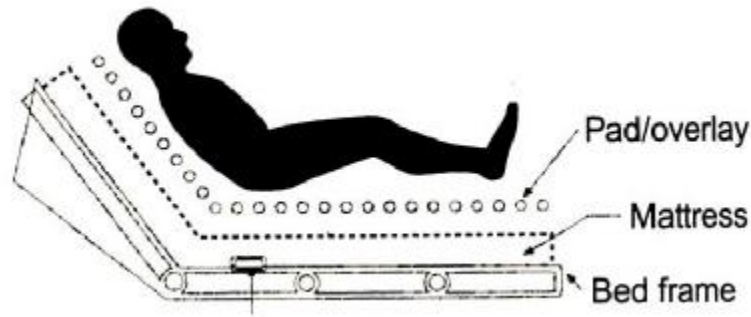
This is the sensing device that is placed in a bed and chair, which monitors the client's usage of the bed/chair. – bed pictured below



9.3 Positioning of Bed Occupancy Sensing Panel

Instructions provided with the pad should be followed- they are summarised below:

Typically, these are placed between the mattress and the bed frame, around 1/3 of the distance between the head and foot of the bed. The panel should be placed across the bed (as shown in the following diagram).



The block under the mattress above shows the location of the panel. Note that the bed does not have to be a raised mattress type.

For a single bed, a single bed-sensing panel should be used. **If the resident sleeps alone in a double bed, two bed sensing panels should be used.** One panel should be placed on either side of the bed, each as described above.

ENSURE THE UNIT IS SET UP WITH A PERSON OF SIMILAR WIGHT AND SIZE IN THE SAME SLEEPING POSITIONS.

If the resident sleeps in the bed with a partner, spouse or carer, only one bed-sensing panel should be used, on the side of the bed that the resident sleeps on. The panel should be positioned as described above.

9.4 Positioning of Chair Occupancy Sensing panel

The chair sensing panel is typically fitted between the squab (the chair cushion the resident sits on) and chair frame/base.

9.5 Connecting Bed and Chair Occupancy Sensing Panels to sensor module

If a single bed panel is being used, this should be connected to the connector labelled "IP2" on the sensor module. If two panels are being used, they should be connected to the connectors labelled "IP2" and "IP3" on the sensor module. It doesn't matter which sensor is plugged into IP2 or IP3.

9.6 Extension Time Button

An optional absence extension time button can be connected via IP1 of the sensor module. The cable should not be extended.

9.7 X10 Equipment

An X10 Controller is on the left and an X10 Appliance/ Lamp Module on the right.

The X10 controller connects to the X10 input on the sensor module using the lead from the X10 box. The cable should not be extended.

The manufacturer's instructions supplied with the X10 equipment should be followed

As mains appliances are being controlled, consult a suitably qualified person if in any doubt.

The X10 Controller should be plugged into a convenient mains socket reasonably close to the sensor. The X10 appliance module should be connected to the required appliance (e.g. light). The socket on this module is NOT controlled.



9.8 X10 House/Module Number

Each X10 Module has a House and Unit address and it is important that these match the information programmed into the sensor module. The X10 Module address is set using two rotary switches on the front of every module. In the following picture, the address of the module is "K9".



To set the address, simply insert a broad bladed screwdriver into the slot on the rotary switch, until the switch points to the desired address.

Ensure the house address is different to that set on other houses in the locality to ensure no interference. If this is not possible, ensure overall addresses are unique over an approximate 500m distance.

10 BATTERY INSERTION

Four AA batteries as supplied should be inserted within the battery compartment. The necessary polarity markings are moulded into the plastic. Only High Power alkaline should be fitted e.g. Duracell or Duracell Ultra
The Sensor will beep briefly on initial power up, but not if power has only been removed for a short while. A double beep indicates the clock has lost its time. If it beeps continuously then either a cell has been fitted the wrong way round, or flat batteries have been fitted.

11 SETTING UP THE PALM™ OR PALM™ EMULATOR

The occupancy sensor is configured using a Palm™ handheld computer or an Emulator on a PC. A mixture of emulator and processed Palm Images has been used..

The Palm™ will first require the configuration software to be loaded- this is done via a personal computer. Also any notes that the Palm™ makes will be saved to the PC.

The Emulator comes bundled with Tunstall Software.

NOTE Only Press keys ONCE (despite the delay); repeat presses can cause problems.

11.1 Installation of software into Palm using SD ROM

The Palm should be switched off. The SD card should be inserted into the Palm following the Palm instructions.

11.2 Installation to PC

See the Palm instructions for installation and ensure that it is possible to Hotsync (synchronise) the Palm. Also ensure that the Palm time is correct- it is used to set up the sensor times and is critical to the correct system operation

11.3 Installation of Palm configuration software

The software supplied on CD should be transferred to the Palm using the Palm Hotsync feature

11.4 Running configuration software

Tap the 'SENSOR MODULE sensor tool' icon on the Palm desktop. **Ensure that the Palm time is correct-** it is used to set up the sensor times and is critical to the correct system operation

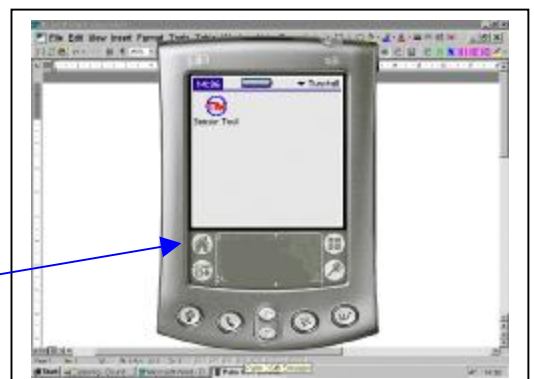
11.5 Installation via PC

The Palm™ will first require the configuration software to be loaded- this is done via a personal computer. Also any notes that the Palm™ makes will be saved to the PC.

The Emulator comes bundled with Tunstall Software.

See the Palm instructions for installation and ensure that it is possible to Hotsync (synchronise) the Palm. Also ensure that the Palm time is correct- it is used to set up the sensor times and is critical to the correct system operation

HOUSE



11.6 Installation of Palm configuration software

The software supplied on CD should be transferred to the Palm using the Palm Hotsync feature

11.7 Running configuration software

Press the 'SENSOR MODULE sensor tool' icon on the Palm desktop. **Ensure that the Palm time is correct**- it is used to set up the sensor times and is critical to the correct system operation

11.8 Running Emulator configuration software

When the emulator software is installed, it should come up with Tunstall Icon. If any of the following screens comes up press HOUSE until the Tunstall icon appears.



11.9 Running Emulator configuration software

When the emulator software is installed, it should come up with Tunstall Icon. Right Press the mouse on the screen area and the following diagram should appear.

It is important that the correct port is configured for 9600 baud. Press Properties

The correct port should be set up.

A hard cold reset should now set up the software.



12 CONFIGURING THE BED/CHAIR OCCUPANCY SENSOR.

Note that some familiarity is assumed with standard Palm™ operation.

Ensure the Palm™ or the PC has the correct time set - this is very important as the time information is transferred from the Palm™ to the sensor module during programming. Consult the Palm user manual for details on how to confirm this.

12.1 Load up the Sensor Unit software without the sensor connected.



12.2 Connect the serial lead to the Palm™ or PC FIRST.

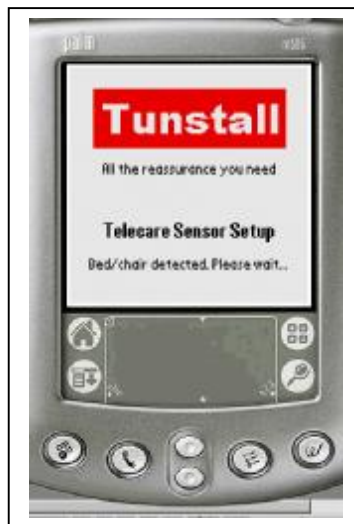
It is recommended that the Palm is placed on a flat surface to ease programming and facilitate optimum connections.

12.3 Connect the serial lead to the IP4/Prog socket on the Bed/Chair Occupancy Sensor.

At this point the Sensor must emit a beep and the Palm™ will load up the configuration screen and the current settings as shown in the following screenshots.

EXPECT SEVERAL SECONDS DELAY FOR THE PALM TO RESPOND. Observe the “please wait” notification.

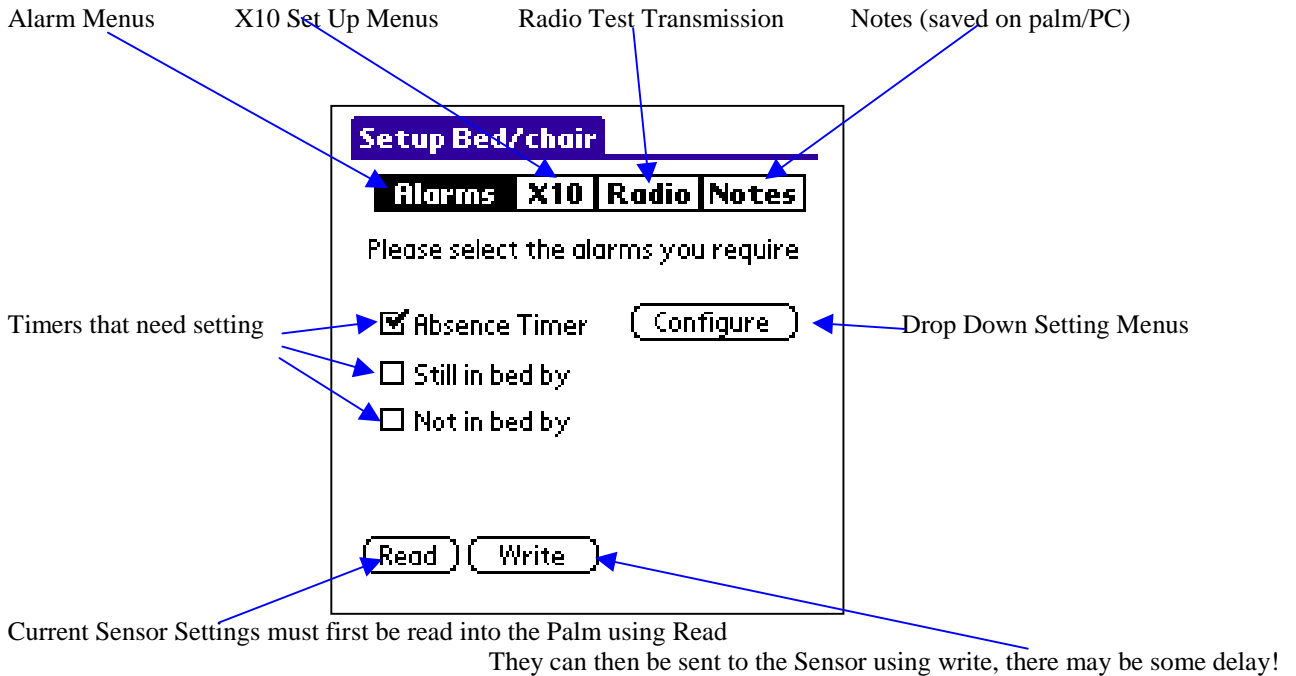
If this screen is not observed then check cables, connectors, configuration, ports etc



13 SETTING UP THE BED/CHAIR SENSOR

13.1 Setting up Screen

The following screenshot shows the default screen after a sensor has been connected. Different parts of the configuration can be viewed by using the stylus to tap on the appropriate part of the screen.

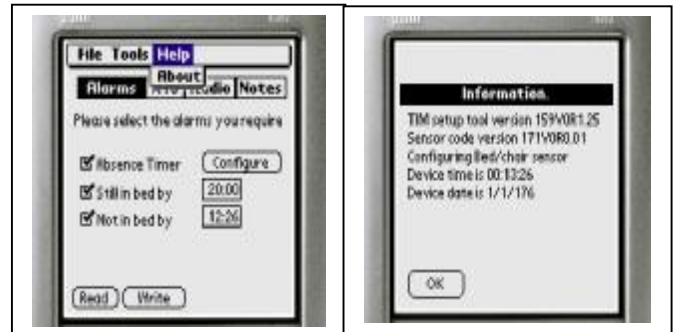


13.2 Reading the TIM time

Any setting of the unit alarms will rewrite its internal clock. READ settings gives the PALM time. If the TIM time is needed than Press on the blue area. This will show the information menu.

Press Help

Press About. Note the blue top rectangle will say READING. After a delay the right hand screen will appear. In this case the Tim clock has not been set, but battery power was supplied 13 minutes previously.



13.3 Press Read Configuration

This will load the current sensor configuration into the PALM, note the blue top rectangle will say READING. After a short time the confirmation window will appear

13.4 Adjusting the Settings

Times are set up using the selection menus shown. When the right value is selected Press OK.

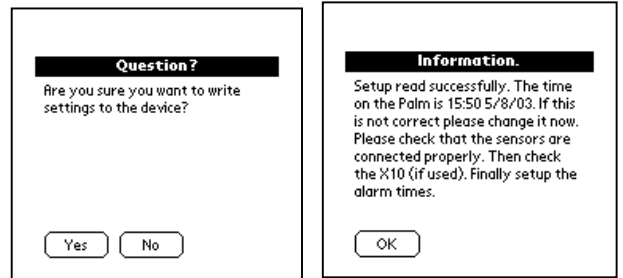
On completion the right hand menu will be shown.



13.5 Press Write Configuration

The question window will appear. Press Yes

This will load the configuration into the Module , note the blue top rectangle will say WRITING . After a short time the confirmation window will appear



14 SELECTING THE ALARMS

14.1 Selecting the alarms

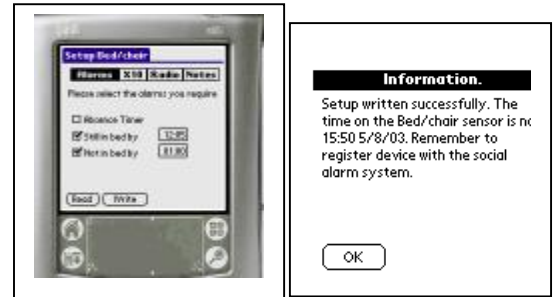
The alarms required are set up using the screen shown.

14.2 Write Alarms

After the confirmation screen write the alarms in .

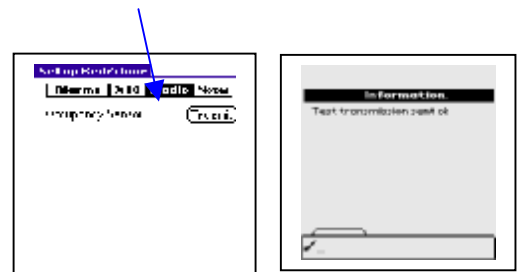
14.3 Home

Pressing the Home key will exit the application.



15 SENDING A TEST MESSAGE

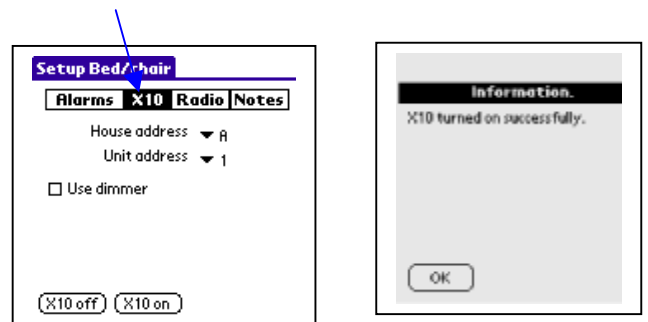
Press the Radio Key. The displayed menus allow a radio test transmission. This can be used to set up or check a Lifeline unit.



16 SETTING UP X10

The X10 Settings on the House module must be set up in accordance with section 9.8. Failure to get the address right will result in no control. If set wrong either this module will control a light in an adjacent dwelling, or and adjacent dwelling will control this light. The lamp will come on immediately an out-of-bed condition is detected, and one minute settling time is given after return to bed

It is suggested the dimmer facility be used for ordinary bulbs, but long-life economy discharge lamps may not work at all when dimmed.



17 CONFIGURING THE MATS

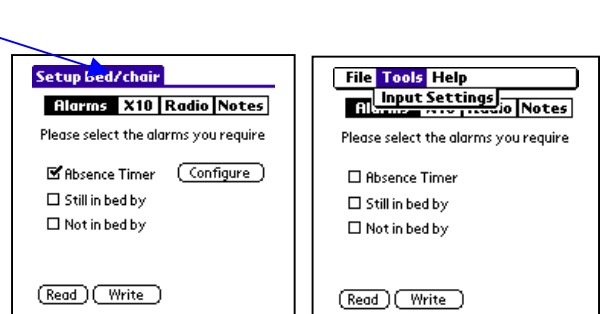
The mats used in the bed should be calibrated for correct operation. There should be a definite "In Bed" state and a "Not In Bed" state.

17.1 The Settings Menu

Firstly access is needed to the settings menu,. This is obtained by Pressing the blue area on the start-up menu then Tools.

The "Input Settings" Box will appear.

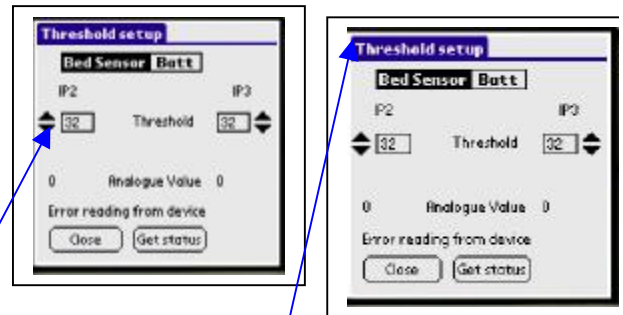
Both Thresholds are set to 32 by the default software, these values should be kept unless the weight of the mattress or items put on the bed cause false alarms. **If so then both values MUST be set the same.** If a value less



than 32 is needed the bed sensor should be checked.

The levels associated with the two sensors will appear. Allow significant time for the unit to read the values. The screen will show “reading values” message. Values can be reread by Pressing “Get status”

The value shown is determined by the sensor. To be unoccupied both sensors must be lower than the lower limit. To be occupied either sensor must be over the upper limit. These limits can either be set manually or automatically.



17.2 THE MAXIMUM AND MINIMUM MUST BE SET TO THE SAME

VALUE

Use the ACTIONS menu to save the settings, otherwise they will be lost.

Press here for the ACTIONS menu

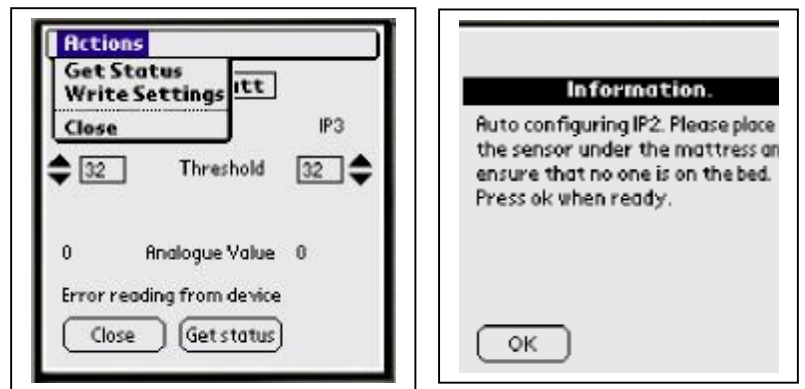
17.3 The ACTIONS menu

The menu must be invoked for saving the settings or for automatically setting the thresholds.

17.4 Automatically setting the bed thresholds.

Select Configure Analogue IP for the correct sensor.

The screen will ask for the bed sensor to be activated with an empty bed, and with the person lying in a typical position on the bed.



17.5 If satisfactory mat readings cannot be obtained

Check the bed sensor is working, i.e. that different values are obtained if weight is added.

Move the sensor top a position where the maximum body weight is applied to it. For very light weights it may be necessary to put it above the mattress.

17.6 CHECK THAT A TEST CALL CAN BE RECEIVED.

If it was a radio problem check the distances involved and the receiver unit settings.

18 READING THE UNIT'S TIME

On most of the screens the time indicated is Palm time. If problems are experienced then Press the blue top area. Then Press Help. Press About. The screen will show Reading.



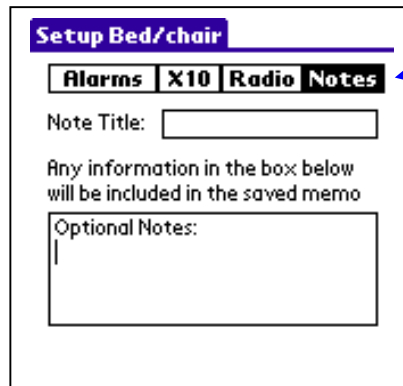
The final screen will show the unit's time, or as in this case an error message.



19 MEMO EXAMPLE

After the Palm™ has programmed the configuration it will make a note of the settings in the Palm™ memo pad. If you wish to add any information, for example the reason for the change this can be done, before programming, by changing the text in the box on the "Notes" page. These memos can then be uploaded to a PC to provide a permanent record of the Bed/Chair Occupancy Sensor configuration by placing the Palm™ in the cradle and Pressing the Hotsync™ key.

Consult the Palm manual for further details of this process.



Press here for Notes

20 NOTE THE SETTINGS

After the Palm™ has programmed the configuration it will make a note of the settings in the Palm™ memo pad. They should be noted on the User Manual also.

APPENDIX JA: QUICK REFERENCE MANUAL BEFORE YOU START

If you have X10 fitted ensure you know the house and unit numbers.
Ensure you know the time period each day you want the unit to work.
Ensure you know what alarms you want.
Ensure you know the delays you want
Ensure the receiving unit is on and ready to receive test alarms.



Battery Insertion

Insert the four batteries in the correct places, the unit should beep once but not if power has only been removed for a short while. If it beeps continuously then either a cell has been fitted the wrong way round, or flat batteries have been fitted.

Setting up the Palm™ or Palm™ Emulator

Assemble the PALM kit and cables (or the PC and emulator). Switch on.
DO NOT CONNECT TO THE SENSOR
Ensure the PALM/PC clock is **set correctly**.



Plug In The Sensor

The unit should beep and the PALM register with the unit.
After a delay the first configuration menu should appear

Check ALARMS is in reverse text; if not select it.
Select the alarm you wish to generate by ticking the check box.
Configure the alarm by selecting the time box and then the value in hours and minutes required.
When satisfied press OK.

Set up ALL the alarms you require

Press **WRITE** to configure the sensor
Press OK after the delay

It is advisable to record the values set on a settings sheet (check by pressing READ).

IF X10 is fitted

Press X10 block.
Confirm House address and unit address.
Use dimmer if required
Select on or off

Radio Test

Press RADIO block.
The sensor should beep and the CORRECT radio alarm received by the Lifeline.

This feature can be used to configure the Lifeline unit or system.

APPENDIX B TUNSTALL SENSOR CHECK SHEET

Address	
Room	

BED / CHAIR

Absence time (mins)	
Extension time (mins)	
Always active (Y/N)	
Monitoring Period Start Time (hr/mins)	
Monitoring Period End Time (hr/mins)	
Light control start (-hr)	
Light control stop (+hr)	
Still in bed by (hr/mins)	
Not in bed by (hr/mins)	
X10 House	
X10 Unit	
Dimmer (Y/N)	
Use (Y/N)	
Transmission Check	

WANDERING

Absence time (mins)	
Door Left open (Mins)	
X10 House	
X10 Unit	
Dimmer (Y/N)	
Use (Y/N)	
Transmission Check	



All the reassurance you need

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