

Installation and user guide



Bed/Chair Occupancy Sensor

D4107100B

All the reassurance you need



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1.0 Introduction

The Tunstall Bed/Chair Occupancy sensor is an advanced Telecare sensor for use with clients who may be at risk of falling when getting out of bed or out of a chair. The Bed/Chair Occupancy sensor is compatible with all Tunstall 869 MHz social alarm systems.

The Bed/Chair Occupancy sensor is highly configurable allowing alarms to be raised if the:

- Client gets out of bed/chair and is absent from bed/chair for a given time. This monitoring can be continuous i.e. all day or over a given time period
- Client has not got into bed/chair by a given time
- Client has not got out of bed/chair by a given time

It is also possible to automatically switch on a lamp e.g. bedside light when the client gets out of bed to help reduce the risk of night-time falls. The lamp can optionally be dimmed up and down to avoid startling the person using the Bed/Chair Occupancy sensor

The Bed/Chair Occupancy sensor is configured by a special program that runs on a Palm personal organiser product

Before using a Bed/Chair Occupancy sensor, it is recommended that this manual be read in its entirety.

2.0 Equipment

Bed/Chair Occupancy sensor systems are made up of the following system components:

Part Number	Description	Notes
41005/12	Bed/Chair Sensor TIM unit	Always required
S2011004	Bed sensor pad	One required for bed sensor applications. Note a second bed sensor pad will be required to monitor single occupancy of a double bed
S2011005	Chair sensor pad	One required for chair sensor applications
41005/04	X10 Controller	Optional – required to turn lamp on
D4106002A	X10 Lamp Module	Optional – required to turn lamp on
41005/05	Extend switch	Optional – required to allow client to extend absence time
S4106007	Bluetooth adapter	Parani SD200 Bluetooth adapter (requires S4106008 and D4105005B)
S4106008	Battery box	for S4106007
D4105005B	Cable	for S4106007
SA125	Sensor Tool 2 software	Stored on SD memory card
S4106006	Palm personal organiser (PDA)	Tungsten E2 model

3.0 Functionality

The functionality of the Bed/Chair Occupancy sensor is detailed in this section. Note that although this functionality can be used in a bed or chair sensor application, some features are more applicable to the bed sensor application

3.1. Bed/Chair Absence Alarm

The device will raise an alarm if the person 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 Time:** the time for which a person can be out of bed before an alarm would be raised. Format of hours and minutes.
- **Extension Time** – Allows the person to extend the duration of the absence timer. Pressing a button (the optional Extend switch) 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)
- **Lamp On/Off** - If the optional X10 equipment is fitted then the lamp can be 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 person is in bed- therefore it will turn on automatically when the person gets out of bed.

3.2. Bed/Chair Not In Alarm

If this alarm is enabled, then the Bed/Chair Sensor will raise an alarm if the person is not in the bed/chair by the set time.

3.3. Bed/Chair Not Out Alarm

If this alarm is enabled, then the Bed/Chair Sensor will raise an alarm if the person is not out of the bed/chair by the set time.

3.4. Automatic Low Battery Alarm

The Bed/Chair sensor will raise an automatic alarm if a low battery condition is detected. This alarm will be repeated every 7 days until the batteries are changed in the TIM

3.5. Other Functionality

The Bed/Chair sensor can also be configured to generate MIDAS 2 data for lifestyle monitoring purposes

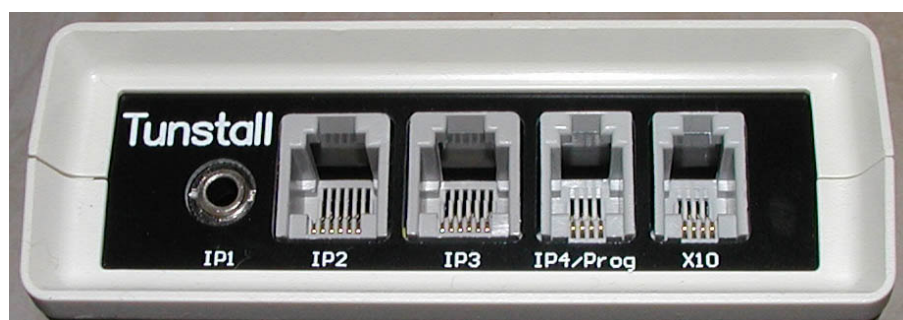
4.0 Installation

Installation of the Bed/Chair sensor comprises of 2 stages:

- installation of the Bed/Chair sensor components
- configuration and testing of the Bed/Chair sensor installation – this is covered in Section 5 of this document

4.1. Bed/Chair Sensor Component Installation

The following diagram shows the front panel of the Bed/Chair Sensor TIM (41005/12)



IP1 is used for the optional Extend Switch (41005/05)

Bed or chair sensor pads (S2011004 or S2011005 as appropriate) should be connected to IP2. If a second bed pad is used then this should be connected to IP3

IP4 is used for connection of the Bluetooth programming adapter assembly

X10 is used for connection of the optional X10 Controller (41005/04)

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) and gently pull the connector out of the socket. If it doesn't pull out, you're not pushing the tab down hard enough.



Positioning of the TIM may require some thought and the following guidelines are recommended: -

- Several cables connect to the TIM and it is important to ensure that the safety of the person is not compromised by trailing cables etc.
- If an X10 Controller is fitted, then the sensor control unit must be within range of a suitable mains power socket.
- If necessary the TIM can be wall mounted using the plastic feet supplied with the TIM. To ensure good 869 MHz radio performance, ensure that the TIM is not mounted onto a metal surface or close to metallic items.

4.2. Bed Pad Installation

The bed pad should be positioned: -

- Across the bed
- Between the mattress and the bed frame
- At around 1/3 of the distance between the head and foot of the bed.
- On a firm base – if the bed frame is not solid, then the sensor pad should be fitted on a suitable sheet of plywood or similar

For a single bed, a single bed sensing panel should be used. If the person 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.

If the person sleeps in a double bed with someone else, then only one bed-sensing panel should be used, on the side of the bed that the person sleeps on. Note that in this case the bed sensor cannot be relied upon to work correctly as correct operation will rely on the other person in the bed not encroaching into the area of the bed monitored by the bed pad. Note that the client must be in bed for at least a minute before the Bed/Chair sensor determines that they are in the bed in order to reduce the probability of false alarms.

4.3. Chair Pad Installation

The chair sensing panel is typically fitted between the squab (the chair cushion the person sits on) and chair frame/base. If the chair does not have a squab (or similar) than correct operation of the chair sensor may not work reliably

4.4. Extend Switch

If the optional Extend Switch is used, then this should be sited within easy reach of the person using the Bed/Chair Sensor

4.5. X10 Equipment

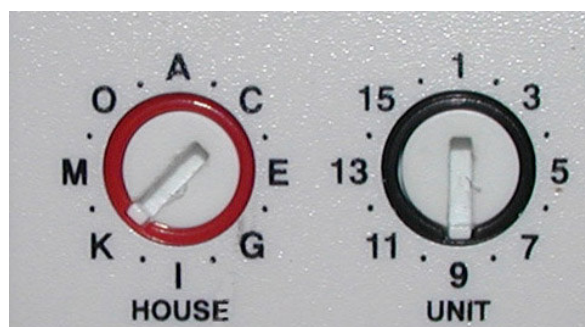
An X10 Main Controller (41005/04) is on the left and an X10 Appliance/ Lamp Module Controller (D4106002A) on the right. The X10 Main Controller connects to the X10 input on the TIM using the supplied lead .



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 Main Controller should be plugged into a convenient mains socket reasonably close to the sensor. The X10 Appliance/Lamp Module Controller should be connected to the required appliance e.g. light. Note that in order for the X10 to be able to control the connected appliance e.g. lamp, any switch on the lamp must be in the 'on' position. Also standard bulbs i.e. not florescent or energy saving lamps must be used if the dimming function is required.

Each X10 Appliance/Lamp Module Controller has a House and Unit address and it is important that these match the information programmed into the TIM. 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.

Within a single house, the unit address should be used to distinguish different X10 Appliance/Lamp Module Controllers. If X10 equipment is installed in different houses that are close to each other, then a different house address should be used.

5.0 Configuration and Testing

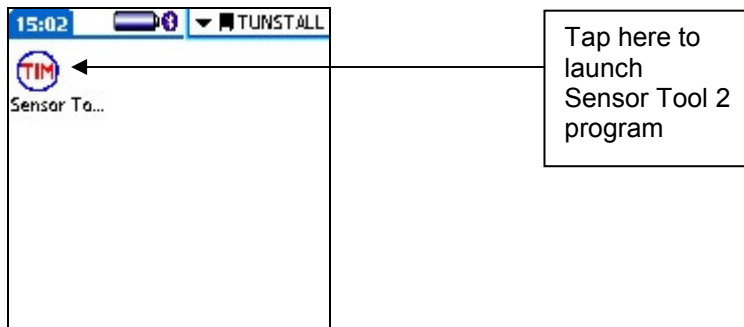
Before the Bed/Chair Occupancy sensor can be used, it must be configured using Tunstall Sensor Tool 2 software running on a Palm personal organiser. The Sensor Tool 2 software allows full configuration of the unit and also incorporates some test functions to help ensure that the equipment has been installed correctly. To ensure you have the latest software version, please visit www.tunstall.co.uk/downloadcentre.

Before attempting to configure the Bed/Chair Occupancy sensor please check that

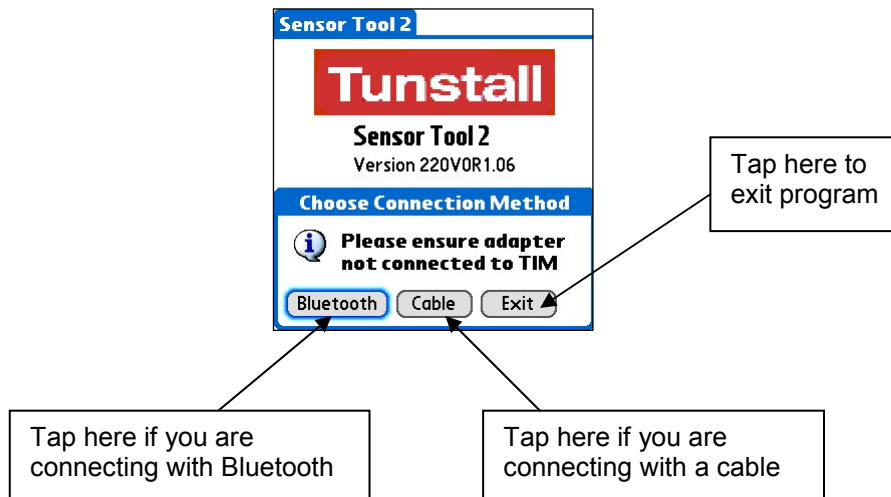
- Batteries are fitted in the TIM. Refer to Section 6.1 for further details.
- The memory card with the Tunstall Sensor Tool 2 software is fitted in the Palm.
- Batteries are fitted in the Bluetooth adapter if it is being used and it is switched on. Refer to Section 7.0 for further details.

5.1. Running the Sensor Tool Software

Insert the memory card into the Palm – the following screen should appear.



The following screen will appear. Ensure the programming lead is not plugged into IP4 of the Palm.



If you are connecting with Bluetooth, the Palm will look for nearby Bluetooth devices. A list of devices will appear. The Tunstall device will be identified as

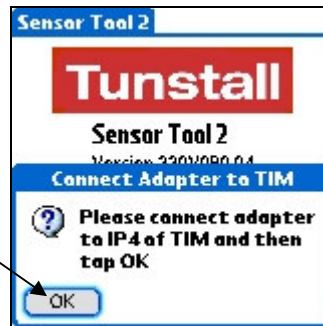
Tunstall #x where x is a number. If you are connecting with a direct cable connection then this section does not apply.



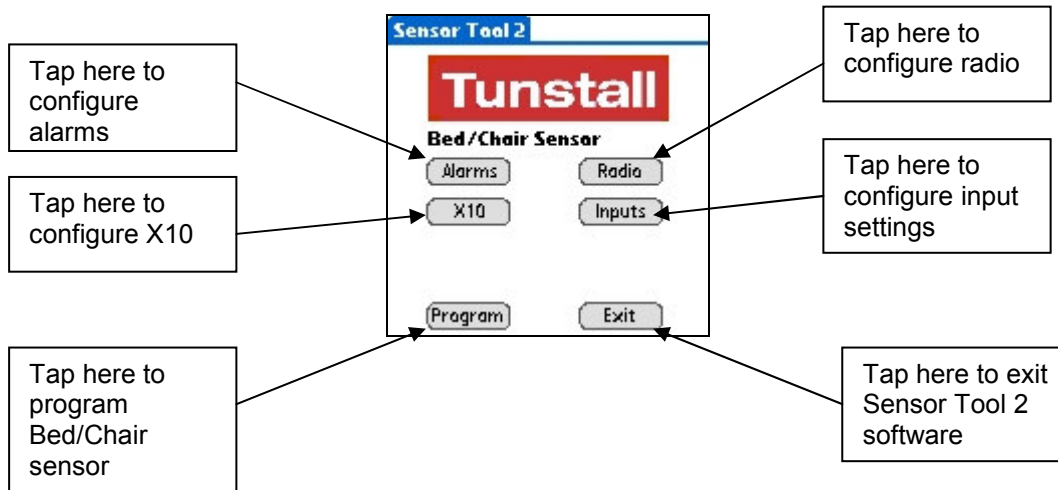
Tap here to select the Tunstall Bluetooth adapter and then tap OK. The Palm will now connect to the Bluetooth adapter

The Palm will now prompt you to connect the programming lead to IP4 of the TIM.

Connect programming lead to IP4 of the TIM and then tap OK



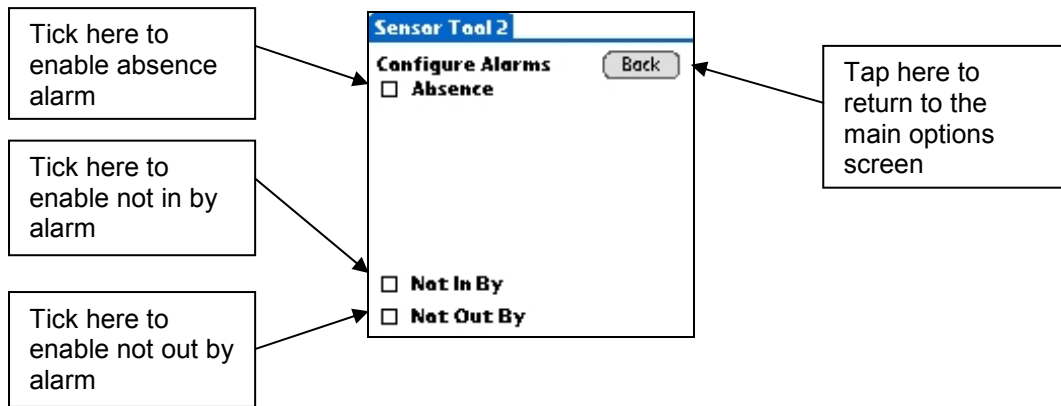
The Palm will now download the current settings from the Bed/Chair Sensor and present the main options screen.



Tapping the Alarms, X10, Radio and Inputs buttons will move to the relevant configuration screen for that part of the Bed/Chair sensor functionality. Each of these screens has a Back button that will move back to the main options screen. Tapping the 'Program' button will write the new settings to the Bed/Chair sensor. Tapping the Exit button will exit the Sensor Tool 2 software.

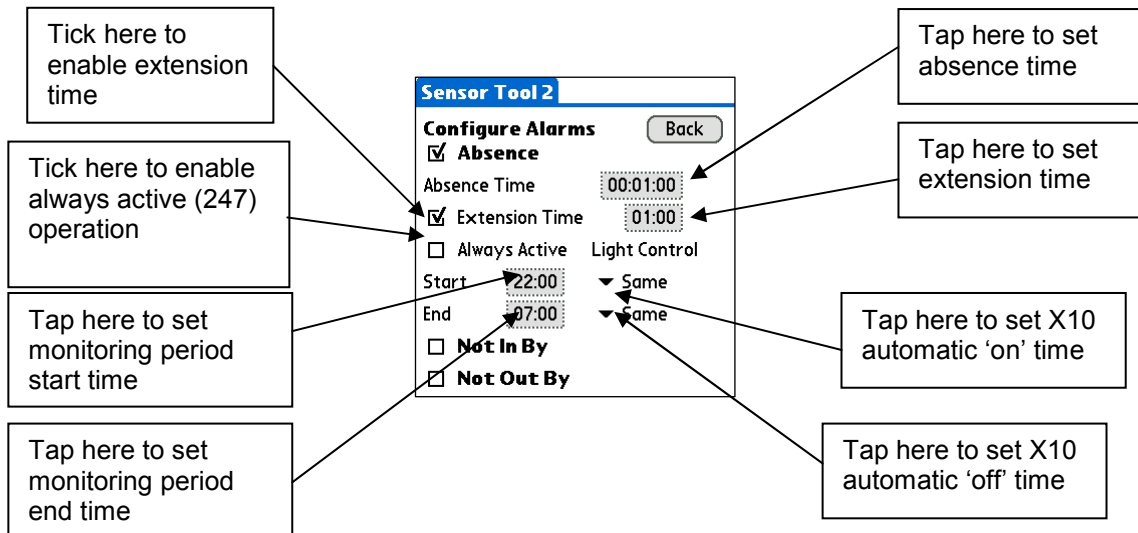
5.2. Configuring Bed/Chair Alarms

The Configure Alarms screen provides a means to configure the alarm functionality of the Bed/Chair sensor. Each alarm can be individually enabled or disabled by tapping the checkbox. If the checkbox is ticked then the alarm is enabled and further configuration options appear.



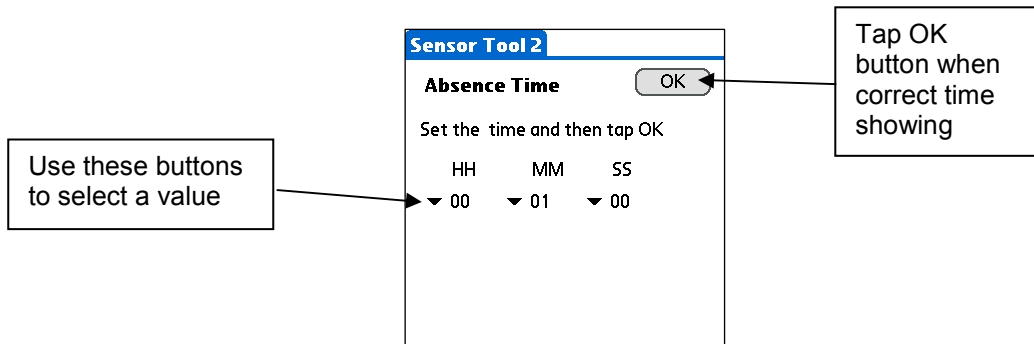
5.2.1. Configuring the Absence Alarm

Ticking the Absence checkbox will reveal the following configuration options.



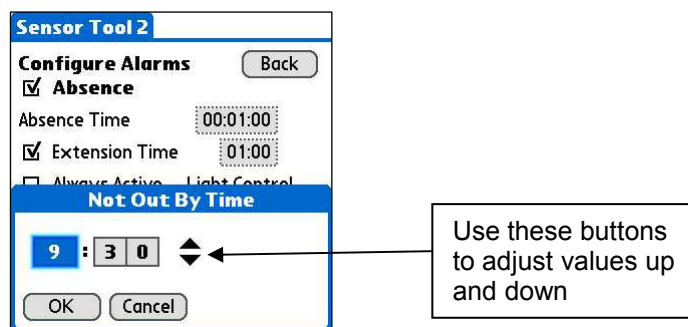
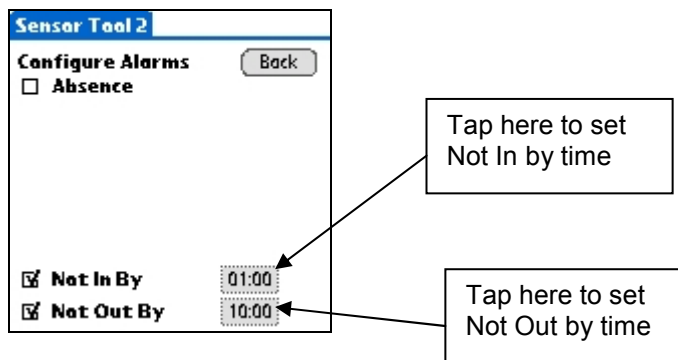
Note that if the Extension Time checkbox is not ticked then the Extension Time is hidden and if the Always Active checkbox is ticked then the monitoring period and lamp control settings are hidden.

Tapping on the Absence Time selector box will cause a new screen to appear allowing the time to be altered.



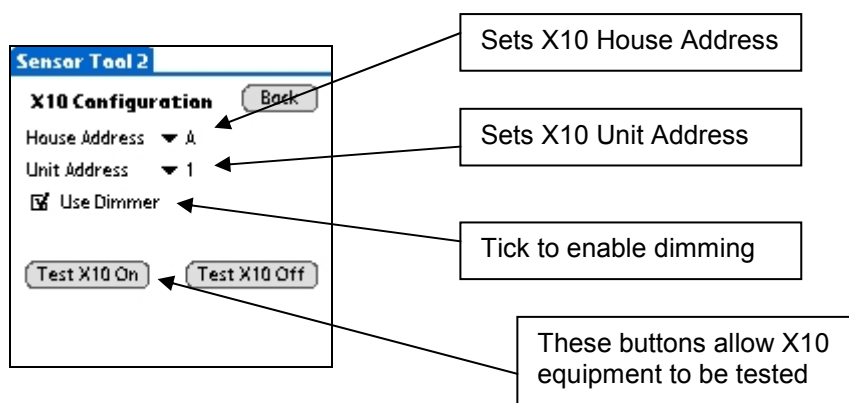
5.2.2. Configuring the Not In and Not Out Alarms

The times for the Not In and Not Out alarms are configured using a slightly different manner. Note that if the relevant checkbox is not ticked, then the time value will be hidden. Tap on the relevant time selector box and a pop-up window will appear allowing the time value to be set.



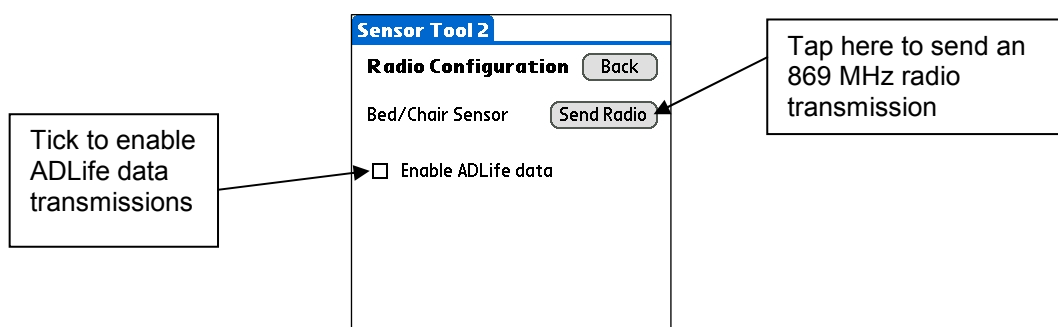
5.3. Configuring the X10 Settings

The X10 Configuration screen is used to configure the Bed/Chair sensor to operate the optional X10 equipment in order to switch a lamp on and off when the client gets in and out of the bed or chair. The House address and Unit address settings must match the settings on the X10 equipment described in Section 4.5. Once the settings are configured, then the equipment can be tested using the Test X10 On and Test X10 Off buttons.



5.4. Configuring the Radio

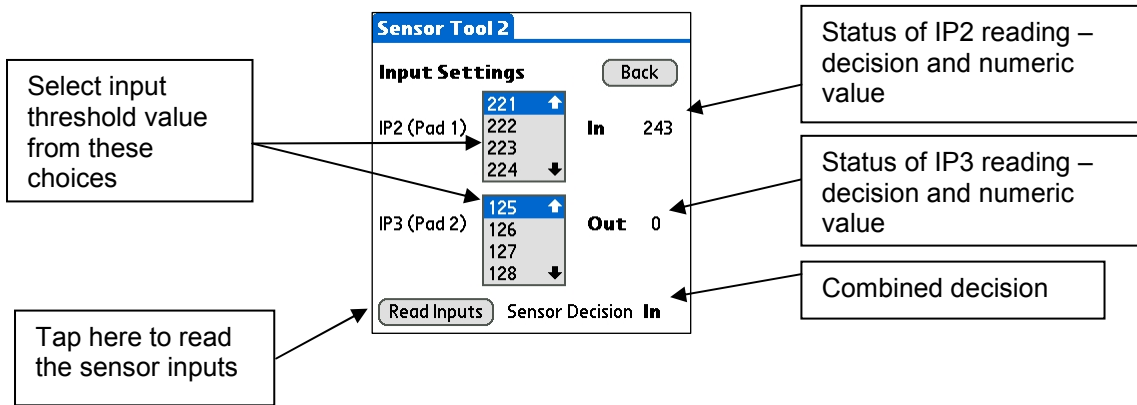
The Radio Configuration settings provide a means of sending an 869 MHz radio transmission from the Bed/Chair sensor so that it can be programmed into a Tunstall social alarm system. Additionally the Bed/Chair sensor can be programmed to generate ADLife data transmissions for use by the ADLife Activities of Daily Living system.



5.5. Configuring the Sensor Inputs

The Bed/Chair sensor can measure a value (between 0 and 255) for the pads connected to IP2 and IP3. This value will change depending if the client is in or out of the bed or chair. The actual value read, when a client is in or out of the bed, will depend on a number of factors e.g. weight of client, weight of mattress, construction of bed etc. so it is necessary to be able to adjust the 'threshold' value which the Bed/Chair sensor uses to determine if the bed/chair is occupied or not.

The Read Inputs button is used to obtain input readings from the Bed/Chair sensor and display them on the screen. The Bed/Chair sensor will determine that the user is in the bed or chair if either the IP2 or IP3 pads indicate the user is in the bed or chair. Note that a pad is normally only used on IP3 to monitor single occupancy of a double bed.



A suitable procedure for setting the threshold values is as follows: -

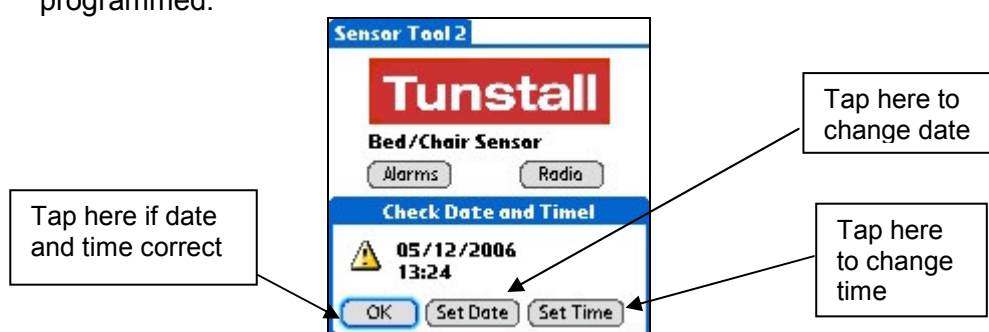
- With the bed/chair unoccupied use the Read Inputs button to measure the numeric input value and note this value
- With the bed/chair occupied, repeat the measurement and note the numeric input value
- Set the threshold value to a value approximately midway between the two readings and repeat the measurement – the status should now indicate that the bed/chair is occupied
- With the bed/chair unoccupied, repeat the measurement - the status should now indicate that the bed/chair is unoccupied

If two bed pads are in use, then it will be necessary to repeat the configuration for both pads i.e. set up for left side of bed and then right side of the bed occupied.

If it is not possible to obtain correct operation then contact your supplier for further advice

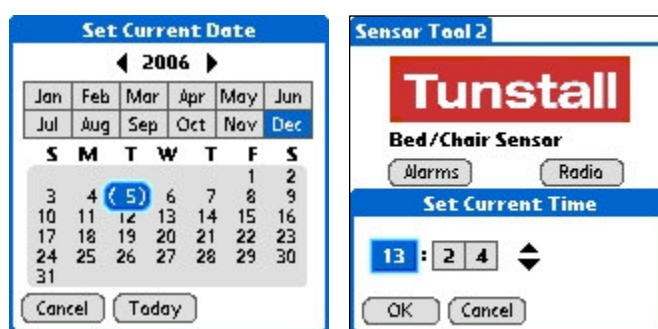
5.6. Programming the Bed/Chair Sensor

Once the required Bed/Chair sensor settings have been configured, then the settings must be programmed into the Bed/Chair sensor using the Program button on the main options screen. It is important that the correct date and time are programmed into the Bed/Chair sensor and these are obtained from the Palm. A prompt is given to check these before the Bed/Chair sensor is programmed:



If the Set Date or Set Time buttons are tapped, then the date or time can be changed using the following screens:

Once the correct date and time settings are displayed, the OK button should be tapped and the settings will be programmed into the unit. When programming is complete, the user is prompted to disconnect the adapter from IP4 of the TIM and the program exits



6.0 Service Considerations

6.1. TIM Batteries

The Bed/Chair sensor will raise an automatic call to the monitoring centre when the TIM batteries need replacing. This battery replacement should occur within 2 weeks of receiving the automatic battery low call.

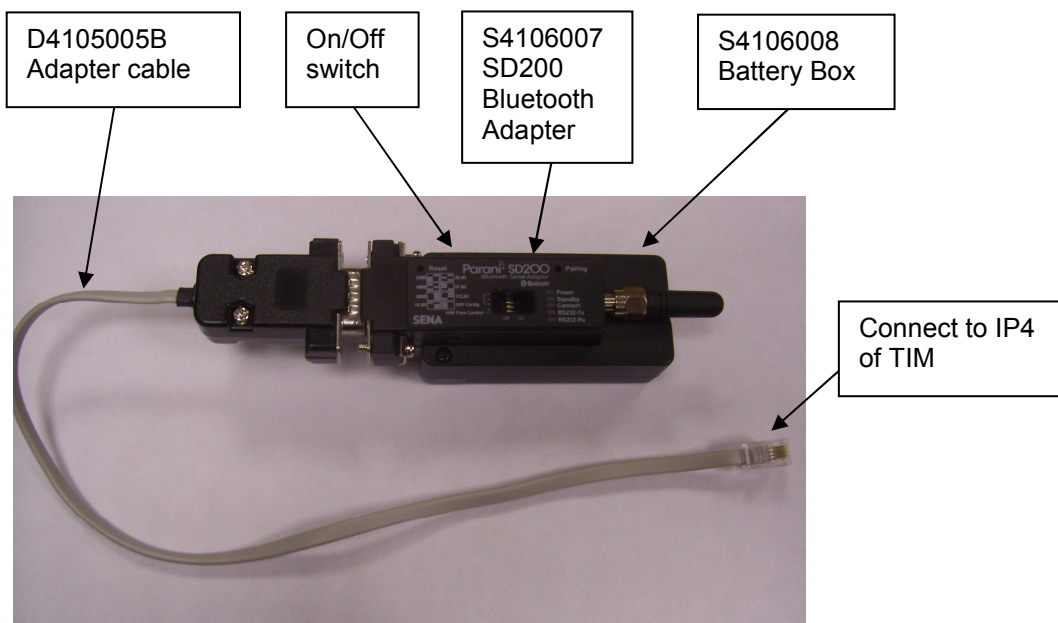
The batteries should be replaced with 4 'AA' alkaline batteries e.g. Duracell or equivalent. The correct orientation for the batteries is moulded into the plastic of the battery compartment

The Bed/Chair sensor should beep briefly when the batteries have all been changed. If the Bed/Chair sensor beeps continuously, then it is likely that the batteries have been inserted incorrectly

6.2. Bed and Chair Pads

The manufacturer of the Bed/Chair pads only guarantees correct operation of their pads for a period of 12 months for the bed pad and 90 days for the chair pad and they recommend that the pads are replaced at these intervals. These periods are minimum periods and it is permissible to keep the pads in service for longer than this providing that the Bed/Chair sensor installation is still working satisfactorily.

7.0 Bluetooth Programming Adapter



The above picture shows the Parani SD200, battery box and cable assembly that is used to allow the TIM to connect to the Palm personal organiser using Bluetooth.

The unit should only be switched on (using the on/off switch) when it is being used. Leaving the unit switched on will result in the batteries quickly becoming discharged.

Low battery state will be indicated by either the red low battery LED (on the battery box) being illuminated or the green 'power' LED (on the front of the unit) not being illuminated when the unit is switched on. The batteries should be replaced by Duracell or equivalent alkaline AA batteries.

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