KIKI DUO OCCUPANCY SYSTEM

Instructions for use

Date of release: 22ⁿᵈ April 2024

Revision: 1.0

Contents

1. Introduction

1.1 Manufacturer's Trademark and Copyright

Kiki is a registered Trademark of Protronic.
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Protronic
P.O. Box 317
Moorabbin 3189
Australia
Email: info@protronic.com.au

1.2 Intended Use

The Kiki Duo Occupancy System is intended to assist a caregiver by monitoring for the presence of a patient on a mattress, and to provide a notification if that person was to get up.

The Kiki Duo Occupancy System is approved for use in both professional and home healthcare environments.

Important Information:
This device is intended to be used as an AID only.
It is not designed to replace adequate supervision.
This device cannot, in itself, reduce or prevent the risk of falls or wandering. It remains the responsibility of the organisation to ensure that appropriate policies and practice are observed at all times.

1.3 Symbols used in this manual

WARNING – If the instructions are not adhered to, the situation may result in death or serious injury

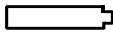Instruction contains important information

Power/Standby – This button either powers the unit on or off, or arms or disarms the sensor

Refer to instruction manual

Manufacturer contact details

Battery symbol, nib indicates +

Regulatory Compliance Mark (RCM)

Type B applied part

1.4 The Real Kiki

Hi, my name is Kiki. I'm a border collie and have been part of my human family for longer than I can remember. I love my family and they let me do everything with them. In return, I look after them.

I always sleep with one eye open so I can keep an eye on what's going on.

If there is a noise, I know about it.

If something moves, I know about it.

If someone is not well, I know about.

If the neighbour's cat dares to wander into my backyard, I know about it.

I even know what people are about to do, before they do it.

And if something is not right, I sound the alarm!

My family say that I'm loyal, intelligent and reliable. I don't know what that means exactly, but I do like doing my job…. that, and running down the beach.

Licks for now,

Kiki.

1.4 The Real Kiki

2. Description of the system

The Kiki Duo System is a bed occupancy system which has been carefully designed by Biomedical Engineers with many years of hospital experience, working specifically with falls prevention technology. Its design is a culmination of on the ground experience, hearing and understanding the requirements of clinical staff and prioritising accuracy and reliability through the use of intelligent algorithms and reliable electronics. It is easy to use, with a minimum of components.

The Kiki Duo System has a choice of two long life sensors; a thin, durable and easy to use "over the mattress" sensor, or a flexible unobtrusive "under the mattress" sensor. The sensors provide options to ensure reliable detection on all mattress types, including pressure relieving air mattresses. Patient presence is accurately determined by the application of an intelligent algorithm to data received from the sensor. False alarms are virtually impossible and patient safety is maximised.

The Kiki Duo System has two alerting outputs, in addition to a local audible alarm. A robust pager which receives alarms and messages from the sensor, or a direct connection to an existing nurse call system.

The system operates on readily available AA alkaline batteries.

The Kiki Duo System is proudly designed and manufactured in Australia.

3. System Identification

Power / Standby Button

Armed LED

Alarm LED

Calibrate Sensor Button

Sensor Standby LED

Calibration Required LED

Check Sensor LED

Sensor Fault LED

Low Battery LED

Local Volume Switch

Hanging Loop

Sensor Input Connector

Nurse-Call Output Connector

Serial Number

Battery Cover
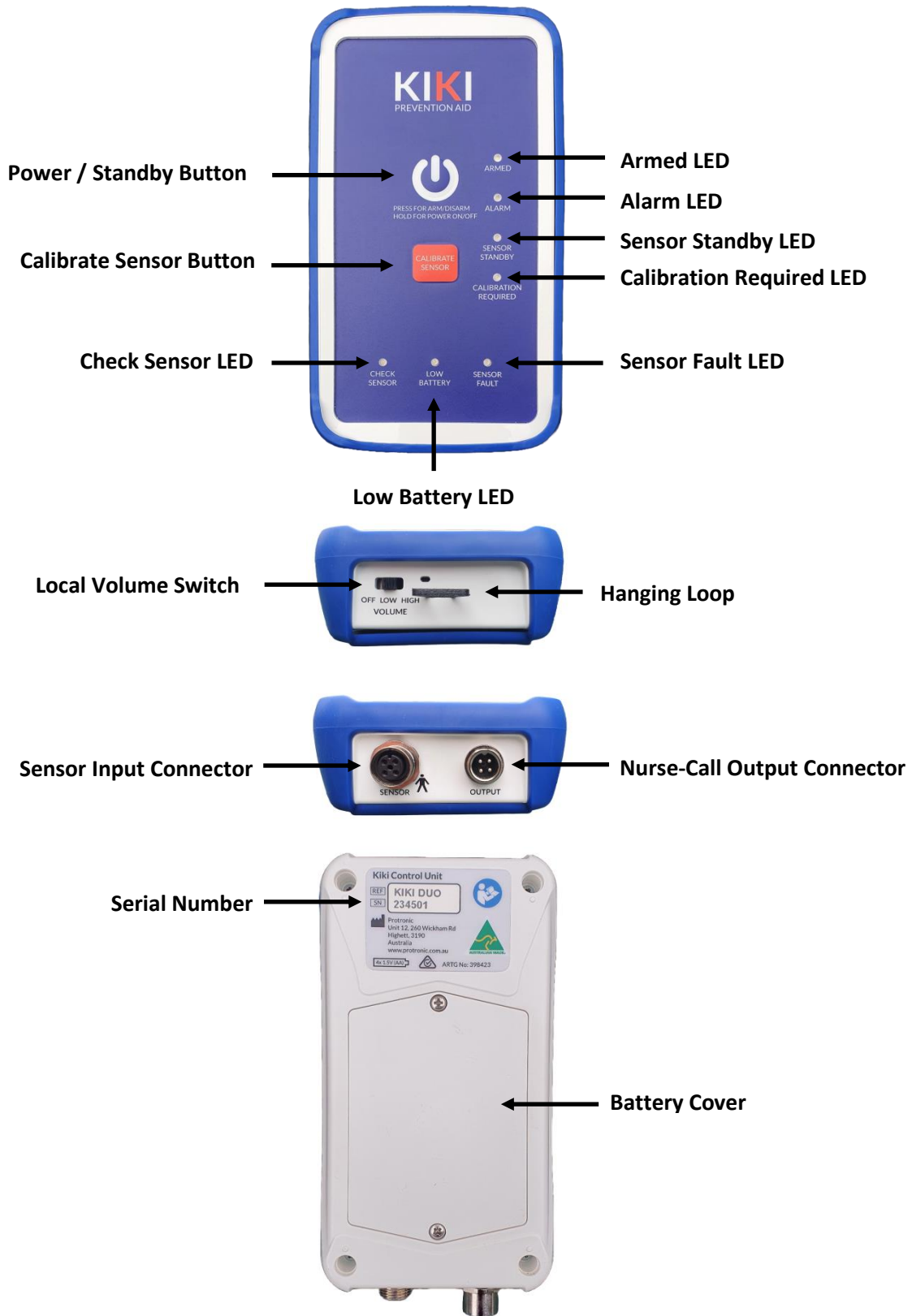
Kiki Duo Control Unit
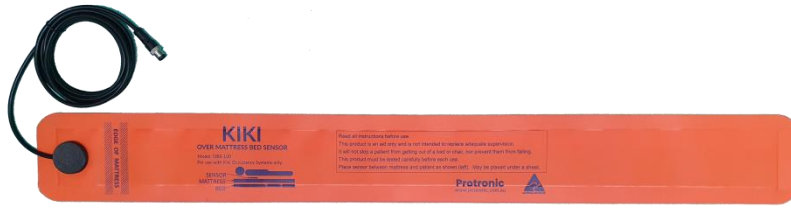
OBS-100 Over Mattress Bed Sensor

UBS-100 Under Mattress Bed Sensor

Pager / Receiver

Nurse-Call Output Cable

4. Before first use.

1. Ensure all parts are present. See Section 3 for identification.
   - Control unit
   - Sensor
   - Pager and/or nurse call output cable

2. Confirm the preferred alert notification method for your facility – Nurse-Call system or Pager.

If using a pager:

The reception range of the pager will vary with location and will be affected by obstructions (walls, windows, doors, etc) or local interference (electrical noise from other equipment or transmitters). It is important to know the distance from the control unit at which the pager will reliably receive messages, along with any black spots. A transmission range test should be performed before the Kiki Duo System is first used in any new location.

To perform a transmission range test, hold down "Calibration Required" and press the "Power" button to turn the unit on in Test mode. Press the "Calibration Required" button until the Sensor Standby LED is illuminated. This enables test mode 4 where the control unit will send a test message to the pager every 5 seconds. Place the control unit in the position where it will be located when in use. Walk around with the pager to determine the limits of reliable communication. Take care to identify any dead spots. Hold the "Power" Button for 3 seconds to turn off the system and exit the test mode.

If using the Nurse-Call output:

The Nurse-Call Output Cable supplied with the system will suit many brands of nurse-call system. If the connection is not compatible an adapter may be required. Alternatively customised cables are available. Contact your supplier for more information.

Test the Nurse-Call Output is working correctly with your Nurse-Call system by simulating an alarm.
1. Connect a Sensor and the Nurse-Call Output Cable. Turn the system on.
2. Calibrate the sensor – Press the Calibration Button for 3 seconds.
3. Unplug the sensor to generate a Sensor Fault Alarm. The Nurse-Call system should be triggered.
4. Hold the Power Button for 3 seconds to turn off the system and clear the alarm.

The Kiki Duo Nurse-Call relay output is configurable to suit virtually every brand of Nurse-Call system. Whilst the default setup will suit many, some brands or customised setups may require the unit to be reconfigured. To modify the output configuration see Section 14.1 – Nurse-Call Output Configuration.

5. Sensor Selection

The Kiki Duo System offers a choice of 2 different types of sensor.

The **OBS-100 (Orange sensor)** is thin and durable sensor which must be placed on top of the mattress. It may be located underneath the sheet. For best performance, it should be located mid-torso on the patient.   The easy placement is ideal for short term monitoring of patients, although it is also suitable for longer term use if desired.

OBS-100 (Over Mattress Sensor)

The **UBS-100 (Blue sensor)** is a thin flexible sensor which is designed to be placed underneath the mattress, on top of the bed base. For best performance, it should be located mid-torso on the patient and centrally located across the bed. This sensor is unobtrusive and undetectable by the patient. The UBS-100 sensor provides maximum patient comfort and will not contribute to any pressure related injuries, whilst still providing accurate occupancy detection.

UBS-100 (Under Mattress Sensor)

Both the OBS-100 and UBS-100 sensors are compatible with foam mattresses and pressure relieving air mattresses. If use with an innerspring mattress is desired, the system must be tested thoroughly to ensure it arms and alarms correctly before use with a patient.

The UBS-100 must be kept flat during use and should only be used on a solid base – slatted bases must not be used.

Both the OBS-100 and UBS-100 sensors are designed to be used in a bed occupied by only one person.

If using the either the UBS-100 or OBS-100 sensor with a pressure relieving air mattress, the sensor should be placed on a 45degree angle across the bed, otherwise "Check Sensor" errors or false alarms may occur.

Incorrect placement of the sensor will not allow the system to "see" the patient, as a result arming of the system will not occur and a "check sensor" alert will be generated.

6. Using the System

6.1 Batteries

Ensure the control unit is fitted with 4 AA Alkaline (1.5v) batteries.

    a. Remove the shock proof cover. Loosen the 2 screws on the battery cover and remove the battery cover.
    b. Install 4 new high quality alkaline AA batteries, ensuring correct polarity (as marked)
    c. Replace the battery cover and tighten screws.
    d. Replace the shock proof cover.
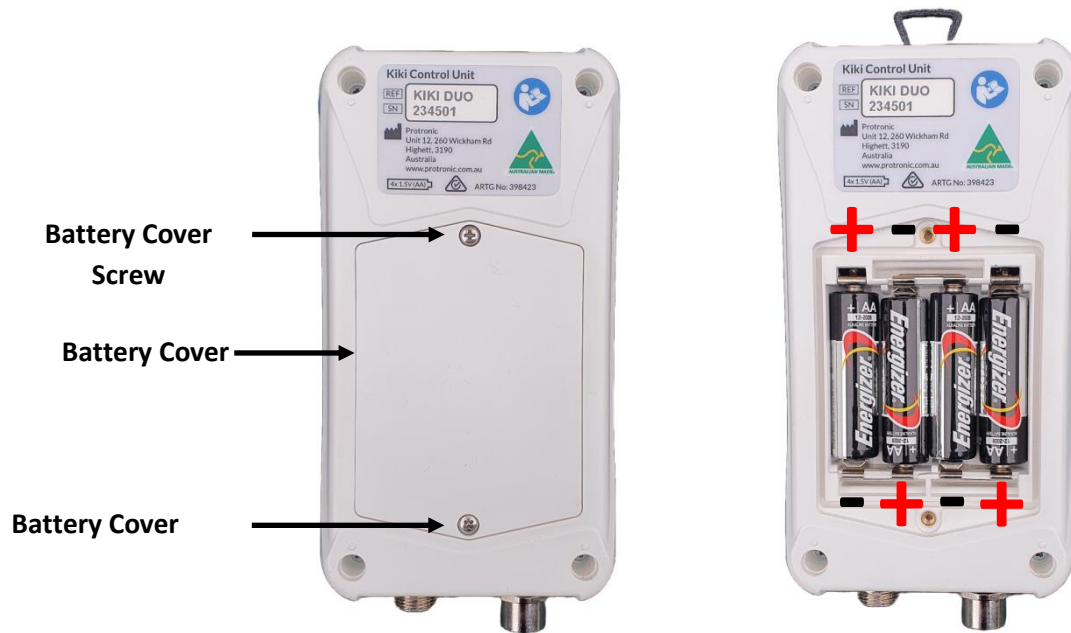
Battery access, location and polarity

Do not mix battery types, chemistries or capacities. Always replace the batteries as a set. This device is not designed for Lithium Ion or other rechargeable batteries. Incorrect battery type may result in damage to the device and possible injury to the user.

6.2 Pager

If using a pager, ensure you have the correct pager for the unit.

    a. The pager screen shows the serial number of the Kiki Duo control unit it is programmed to receive messages from.
    b. Ensure the pager has adequate battery capacity and the low battery indicator is not active. Replace the AAA battery if required. See the Pager User Manual for more details.

| Pager Front | Pager Rear | Pager Battery |

6.3 Nurse Call Connection

If connecting the system to a nurse-call system, connect the nurse-call output cable to both the control unit and the nurse-call system input.

Attach the Nurse-Call output cable to the Kiki Control unit. The connector is keyed and can only be inserted one way. Tighten the lock nut fully.
Connect the other end of the output cable to the input of the nurse-call system.

Tighten cable connectors fully

6.4 Local Volume

Set the local alarm volume
 The control unit has 3 levels of alarm volume. This can be adjusted anytime whilst the system is disarmed.
OFF – the control unit will not produce any audible alarm tone. Status/error tones will still sound at low volume.
LOW – the control unit will produce audible alarm tones and status/error tones the same as HIGH but at a reduced volume level.
 HIGH – the control unit will produce audible alarm tones at maximum volume. Status/error tones will sound at LOW volume.

 Once the system is armed the volume is set. Changing the volume switch will not have any effect until the system is disarmed and then re-armed. The volume switch is located on the end of the control unit.
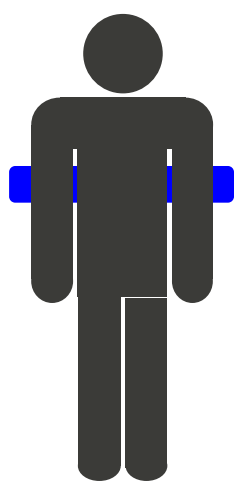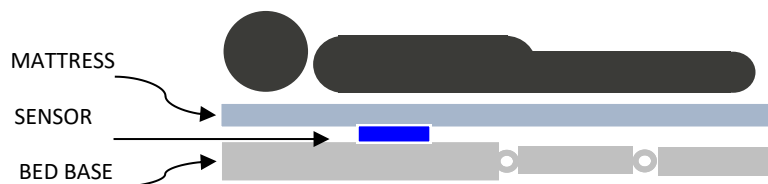

Local volume switch
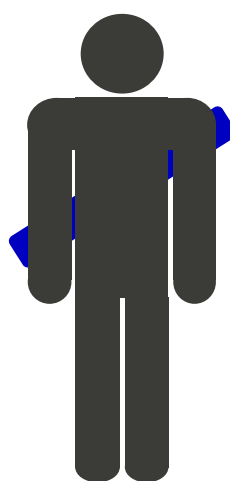
6.5 Sensor Placement

Place the sensor on the bed.
a. See section 3 (Sensor Selection) for guidance on selecting which sensor to use.
b. Place the sensor on the bed as shown below.

UBS-100

MATTRESS
SENSOR
BED BASE

UBS-100 UNDER a foam/standard mattress   **UBS-100 UNDER an AIR mattress**

The under mattress bed sensor should be placed centrally across the bed base where the mid-torso of the patient will be located – around the shoulder blades. Avoid any pinch and pivot points on the bed base.

If the sensor is to be used under a pressure relieving air mattress, the sensor should be placed on a 45 degree angle across the bed, ensuring the sensor is still located below the shoulders of the patient.

Ensure the sensor cable is routed away from the bed mechanism and it will not cause a trip hazard. The bed can be made up as desired.

 The UBS-100 sensor must be kept flat on the bed base to ensure reliable operation. Make sure the sensor does not hang off the edge of the bed.

OBS-100

SENSOR

MATTRESS

BED BASE
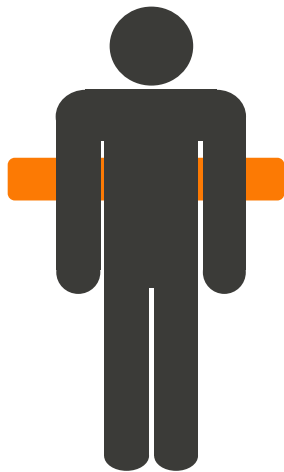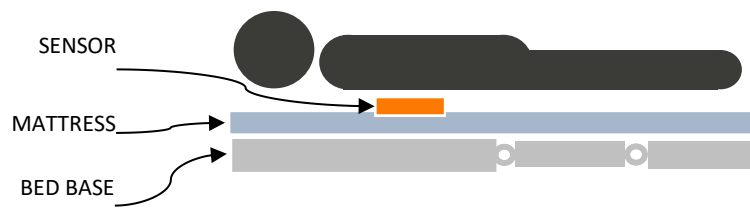
OBS-100 ON TOP of a foam/standard mattress   **OBS-100 ON TOP of an AIR mattress**

The over mattress bed sensor should be placed on top of the mattress under the sheet. It should be located mid-torso (around the shoulder blades) of the patient.
Ensure the markings on the sensor line up with the edge of the mattress and the cable connection block is off to the side of the mattress.

Ensure the sensor cable is routed away from the bed mechanism and it will not cause a trip hazard.

c. Connect the sensor to the control unit. The connector is keyed and can only be inserted one way. Tighten the lock nut fully.

If the sensor is placed in such a way that it cannot "see" the patient, the system will not allow arming and a Check Sensor error will be generated. See Section 7.1 – Check Sensor Error for more information.

6.6 Power the system

Place the control unit in the desired location. Make sure any attached cables do not present a trip hazard. The included rubber strap may assist in finding the ideal location.
Press the Power/Standby button to turn on the system.

The control unit will perform a short self-test and measure the battery capacity.
A two tone beep will sound to indicate all tests have passed.
The control unit will sound 4 beeps if less than 20% of battery capacity is remaining.
Whilst the unit will continue to operate safely until the batteries are fully depleted, consider changing the batteries as soon as convenient.

If the sensor requires calibrating, the Calibration required LED will flash.

6.7 Calibrate the sensor

The sensor **must** be calibrated to an empty bed. The bed should be made up but the patient **must** not be present.

The process of calibrating the sensor is similar in concept to zeroing a set of weigh scales before use.

To calibrate the sensor, press and hold the Calibrate Sensor button for 3 seconds. The Armed LED will flash during calibration. If the calibration is successful, the Sensor Standby LED will begin to flash.

Once the sensor is calibrated, the system will track changes in the environment and small changes to the position of the bed clothes. If any blankets/pillows are added to or removed from the bed, the sensor should be recalibrated.

6.8 Arming the System

Settle the patient and Arm the system.
   a. Settle the patient into bed.
   b. The system can be armed by a short press (less than 1 second) of the Power/Standby button.
   c. If arming is successful, the Green Armed LED will illuminate, a short beep will sound. If applicable, the pager will receive a message confirming the system is "Armed".

The Alarm LED will flash slowly when the system is close to alarming. If the Alarm LED is flashing slowly and the patient is not moving, the sensor position is not ideal and it should be repositioned as a false alarm could be generated.

6.9 Cancel or Disarm the System

If an Alarm has been generated, the system will:
   a. Sound an audible alarm tone from the control unit, if the Local Volume is set to LOW or HIGH.
   b. The Alarm LED will be illuminated. If the alarm is a result of an error or fault, the appropriate LED will be illuminated.
   c. If applicable, the Nurse Call system will be activated when an alarm or sensor fault error occurs.
   d. If applicable, the pager will receive an Alarm or Error message initially, and then every 10 to 20 seconds until the alarm is acknowledged.

> If the system has a Low Battery the sensor cannot be calibrated or armed. The batteries must be replaced. If the sensor was calibrated before the Low Battery error occurred, recalibration of the sensor is not required provided the sensor has not been moved or repositioned on the bed.
> If a Sensor Fault error has been generated, the sensor will require recalibration once the cause of the error has been corrected (for example: sensor reconnected or replaced).

To Cancel or Disarm the system from either an Armed or Alarm state, press the Power/Standby button for less than 1 second.
   • The system will return to Sensor Standby. The Sensor Standby LED will begin to flash.
   • If applicable, the pager will receive a "Disarmed" message following and alarm, or a "Acknowledged" message following an error or fault.

6.10. Powering Off the System

Once the system is disarmed, press and hold the Power/Standby button for 3 seconds.
The system will perform a shutdown process and sound a long beep before turning off.

> Once the system is powered off, the sensor must be recalibrated to an empty bed before it can be armed again.
> If the system is powered off with a Low Battery error, recalibration of the sensor is not required, provided the sensor has not been relocated. See section 7.3 Low Battery Error for more details.

7. Error and Fault Alerts
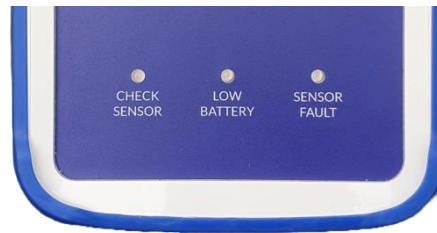
Error/Fault LED indicators

7.1 Check Sensor Error

A Check Sensor error may be generated if the sensor cannot "see" the patient during the arming process.

During a Check Sensor error, the control unit will:
   a. Sound an audible error tone at low volume regardless of local alarm volume setting.
   b. The Check Sensor LED will illuminate.
   c. If applicable, the Pager will receive a Check Sensor message.

This error is generated during arming if the sensor has not been calibrated correctly **or** the patient is not within the detectable range of the sensor. It is not usually an indication that the sensor is faulty.

If the Check Sensor error is generated, check the location of the sensor with respect to the patient (see section 6.5 Sensor Placement to confirm correct location). If the placement looks correct, the sensor may need to be recalibrated before arming is attempted again.

This error is cleared by pressing the Power/Standby Button for less than 1 second to cancel arming of the sensor. The system will return to the Sensor Standby state. If applicable, the pager will receive an Acknowledged message.

7.2 Sensor Fault

A Sensor Fault error is generated if the data received from the sensor is invalid.

During a Sensor Fault error, the control unit will:
   a. Sound an audible Error tone at low volume, regardless of the local alarm volume level setting.
   b. The Sensor Fault LED will illuminate.
   c. If applicable, the Pager will receive a Sensor Fault message.
   d. If the sensor has been calibrated and is in either an armed or disarmed state when the error is generated, the Nurse-Call Output will activate.

The Sensor Fault error may be generated whenever the system has a calibrated sensor attached and the data received becomes invalid. This could be due to the sensor becoming disconnected, a poorly attached sensor connector, a broken wire in the sensor cable or a fault in the sensor itself.

This error is cleared by pressing the Power/Standby Button for less than 1 second to reset the error. The system will return to the Calibration Required state. If applicable, the pager will receive an Acknowledged message. If the error persists, replace the sensor.

The sensor will be required to be recalibrated once the cause of the Sensor Fault error has been rectified. This will require the bed to be empty.

7.3 Low Battery Error

The Low Battery LED will illuminate when the batteries in the control unit are low and require replacing.

If the system is <u>not armed</u> when the batteries become low, the Low Battery LED will illuminate and the control unit must be turned off by pressing the Power/Standby button for 3 seconds. The batteries can then be replaced.

If the sensor was calibrated at the time of the Low Battery alarm, the calibration will be restored automatically, provided the sensor has not been moved or disconnected from the control unit.

If the system is <u>armed</u> at the time of the Low Battery error, the Low Battery LED will illuminate and the system will continue to monitor the patient until the batteries are completely flat. When the batteries are flat, the system will generate a Low Battery Alarm.

During a Low Battery Alarm, the control unit will:
   a. Sound an audible Error tone at low volume, regardless of the local alarm volume level setting.
   b. The Low Battery LED will illuminate.
   c. If applicable, the pager will receive a Flat Battery message, or if applicable, the Nurse-Call output will activate.

To acknowledge the error, press the Power/Standby button for less than 1 second. Only the Low Battery LED will be illuminated and the control unit must be turned off by pressing the Power/Standby button for 3 seconds. The 4x AA batteries can then be replaced. See Section 6.1 Batteries for details on replacing the batteries.

If the system has a calibrated sensor attached at the time of the Low Battery error, the control unit will store the calibration data from the sensor. Once the batteries are replaced and **provided the sensor has not been moved or disconnected**, recalibration of the sensor is not required. The unit will enter Sensor Standby mode once it is powered on again.

If the sensor was not calibrated, or it has been moved from its calibrated position, or was disconnected when the control unit was powered on again, it will need to be recalibrated using an **empty** bed before the system can be armed.

7.4 System Malfunction Error

The Kiki Duo System has been designed to fail safely in the event of a major system malfunction. A malfunction could occur due to exposure to extreme external interference, physical damage to any of the components or failure of any of the internal subsystems.

If a System Malfunction Error is generated, the control unit will:
   a.   Sound a continuous single pitch tone regardless of local volume level.
   b.   The Armed, Alarm, Check Sensor and Sensor Error LEDs will illuminate.
   c.   If applicable, the Pager will receive a System Malfunction message, or if applicable, the Nurse-Call Output will activate.

The error can only be cleared by pressing the Power/Standby button for at least 3 seconds. This will power off the system.

If this error persists, please contact your supplier for further advice.

8. Cleaning

Whilst the Kiki Duo system is durable and robust, an improper cleaning procedure and some cleaning chemicals may result in damage occurring to parts of the system.

It is recommended that all components of the system are cleaned between patients, or when visibly dirty, by wiping all surfaces with hospital grade detergent which has been correctly diluted to the manufacturers specifications, and/or wipes containing a mild detergent based product.

Isopropyl alcohol wipes (70% - 100%) may also be used as required. Ethanol is not recommended.

Never use undiluted bleach, and/or abrasive and harsh chemicals.

Do not submerge any part of the system.

Any damage caused by cleaning with incorrect product or procedure will not be covered by warranty.

9. Storage

The Kiki Duo system is supplied in a durable plastic tub which is recommended for storing the device and its accessories when it is not in use.

The Sensors should never be folded. When not in use, the sensors should be rolled loosely and stored in the supplied plastic tub.

The Kiki Duo Control Unit will not drain the batteries when the system is turned off. However, if the system is not expected to be used for more than 3 months it is recommended to remove all batteries to ensure no damage occurs in case of battery leakage.

The pager has a limited battery life. The pager should be turned off (see Pager User Manual for more information) or the battery removed when it is not in use.

All components should be stored in a dry location out of direct sunlight and within the environmental limits indicated in the Technical Specifications.

10. Service/Repair

The Kiki Duo System should be carefully inspected for wear and tear or damage, and tested for correct operation between each patient use, or at intervals not exceeding 3 months.

The entire system should be thoroughly inspected and tested to ensure compliance with the manufacturers specifications at intervals of no greater than 12 months. This testing should be performed by an individual with sufficient knowledge and qualification to allow for correct identification and rectification of any possible faults or issues.

> The system has a built-in test program which allows testing of each of subsystem. Please see Section 14.2 – Test Modes, of this manual for further information.

The Kiki Duo system has no user serviceable parts. Any repairs to the system should only be performed by a Protronic authorised service representative.

11. Identifying Date of Manufacture

The serial number of the Kiki Duo Control Unit is found on the rear of the unit.

The serial number of the sensor is found on the cable near the connector.

The serial number is 6 digits long with the format *YYWWID*. *YY* represents the year of manufacture. *WW* represents the calendar week of manufacture. *ID* represents the unique identifier for the device within the manufacturing batch.

12. Warranty

Protronic warrants that the Kiki Duo Occupancy System (excluding batteries), when used in accordance with the instructions for use, shall be free from defects in workmanship and materials and will perform in accordance with Protronic's product specifications for a period of Two (2) years (Control Unit and Sensor only) and One (1) year (Pager, Cables and other Accessories) from the date of purchase.

This warranty is provided by the manufacturer:
Protronic, Unit 12 / 260 Wickham Rd, Highett, 3190
Phone +61 481 444 903, Email info@protronic.com.au

This warranty does not cover damage caused by: accident; misuse or abuse; modification; wear and tear associated with use; unauthorised repairs; failure to follow instructions for use; unsuitable storage or operating environment; failure caused by a product not supplied or manufactured by Protronic; failure to use original spare parts or accessories; material breakdown due to incompatible cleaning products; fluid ingress; and other defects not related to materials or workmanship.

To make a claim under this warranty, you must:

1. Contact the distributor from whom you purchased the product, to confirm where to return the product.
2. Provide sufficient documentation outlining the issue with the product and/or reason for the claim.
3. The product which is claimed defective must be received by your distributor, within the warranty period. Upon receiving the product, Protronic will determine whether the claimed fault or defect is covered by this warranty.

If Protronic determines the warranty claim is valid, Protronic will, to the extent permitted by law, at its option repair or replace the unit or the defective material or part. If Protronic repairs or replaces any product, the warranty period for any product repaired or replaced does not extend beyond the original warranty period. Protronic will pay the expenses for shipping the repaired or replacement product.

If Protronic determines the warranty claim is not valid, your distributor will notify you, by providing a quotation for the repair of the product which may also include the cost of returning the product. You have the option of accepting the quotation for repair, subject to your distributor's terms and conditions, or having the unrepaired product returned to you at your expense.

Your rights under this warranty are in addition to and do not in any way affect any other rights or remedies that you have under any law which relates to the product. Our products come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the products repaired or replaced if the products fail to be of acceptable quality and the failure does not amount to a major failure.

13. Technical Specifications

Kiki Duo Control Unit	
Power	4x AA 1.5V Alkaline Batteries
Dimensions	171 x 96 x 45mm
Weight (including batteries and impact cover)	420g
Operating & Storage Ambient Temperature	0 – 50°C
Operating & Storage Ambient Humidity	15-90% non-condensing
IP Rating	2X
Local Alarm levels	3 (Off, Low, High)
Transmitter Frequency, Power & Modulation	434.4MHz, 25mW, FSK (512BPS POCSAG)
Nurse Call Output	Voltage free Normally Open or Normally Closed relay contact. Max rating 1A, 32Vdc
Standard Nurse Call cable length	2m [1]
Standard Nurse Call output connector	6.35mm TRS plug [1]

[1] Custom length and plug types available (maximum length 2m).

GP2009n Pager	
Power	1x AAA Alkaline battery
Dimensions	80 x 58 x 28mm
Weight	80g
Frequency	434.4Mhz
Protocol	512bps POCSAG
Range	Up to 400m[2]

[2] Measured line of sight outdoors. Indoor range will vary based on obstacles and local interference.

OBS-100 Sensor	
Placement location	On top of mattress
Mattress compatibility	Foam, Air, Innerspring
Dimensions	950 x 110 x 1mm
Operational weight range	20-200Kg [3]
Sensor Material	PVC
Cable length	3m

[3] Contact Protronic if extended weight range required

UBS-100 Sensor	
Placement location	Underneath mattress, on top of bed base
Mattress compatibility	Foam, Air
Dimensions	800 x 110 x 1mm
Operational weight range	30-200Kg
Sensor Material	PVC
Cable length	3m

The Kiki Duo System is a TGA registered Class 1 medical device - ARTG # 398423.
The device complies with the following standards: AS/NZS IEC 60601.1:2015, AS IEC 60601.1.2:2017, AS/NZS4268:2017, RCM

14. Technical Instructions

⚠ This section is intended for use by biomedical engineers, technical support providers or those people permitted, suitably qualified, and competent to remove the covers from equipment. Failure to ensure the system is safe and working correctly following repair or configuration changes may result in the system not working as expected. This may result in harm occurring to the patient or user.

14.1 Nurse-Call Output Configuration

The Kiki Duo Nurse-Call output is configurable to suit virtually every brand of nurse call system. Whilst the default setup will suit many brands of nurse call system, some brands or customised setups may require the control unit to be reconfigured.

The Nurse Call Output is a switched relay contact (voltage free) which can be pre-set to either a Normally Open or Normally Closed state. Furthermore, the supplied 6.3mm (1/4") plug can have each of its contacts (Tip, Ring, Sleeve) assigned to either relay contact. The contact is activated for approximately 3 seconds, repeating every 15 seconds during an alarm state.
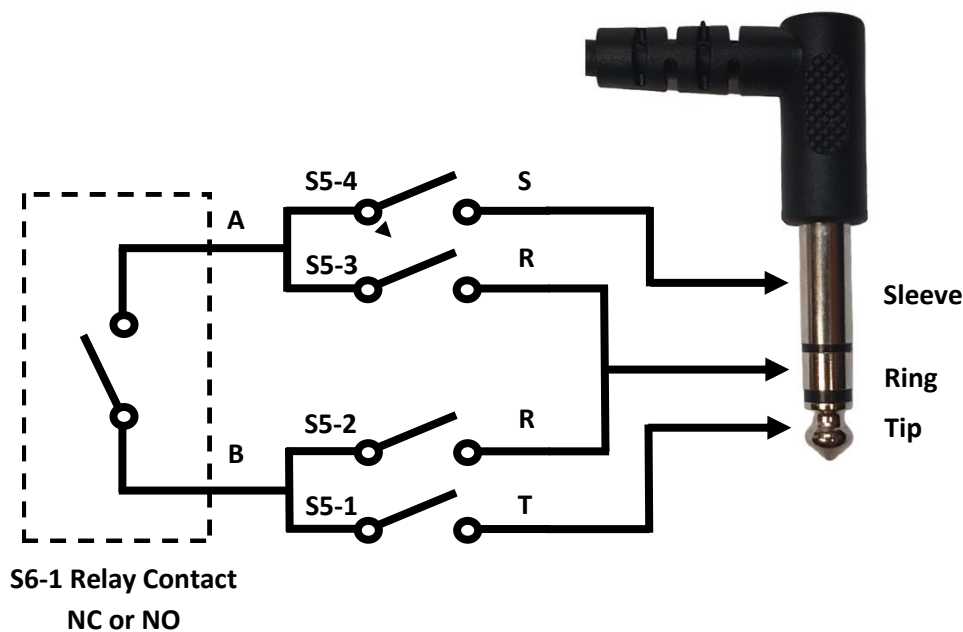

Nurse Call Output Simplified Schematic

ℹ Please contact your nurse-call system service provider if you require clarification of how your system is configured.

To change the nurse-call output configuration:
  a. Remove the battery cover and 4x AA batteries from the control unit.
  b. Remove the 4 screws on the rear of the unit. Remove the front cover.
  c. Locate Dipswitches S5 and S6 as shown below.
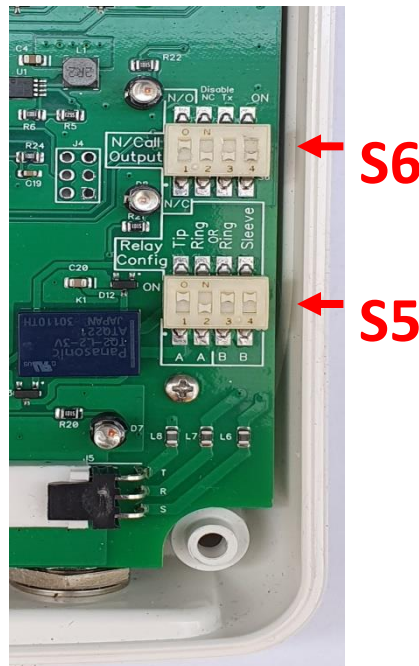
Location of Dipswitch S5 and S6

  d. Change Dipswitch S6-1 to select either Normally Open or Normally Closed output. A paper clip, pen or small screwdriver will assist. See table 14.1 below for possible options.

Nurse Call Contact type	Dipswitch S6-1 N/CALL Output	Dipswitch S6-2 Disable Tx	Dipswitch S6-3 Disable NC	Dipswitch S6-4 Manufacturing use only
Normally Open (NO)	ON	OFF	OFF	OFF
Normally Closed (NC)	OFF	OFF	OFF	OFF

Table 14.1: Dipswitch S6 configuration

e. Change the S5 "Relay Contact" Dipswitches to match your required configuration. See table 14.2 for possible options.

Nurse Call activated by:	Dipswitch S5-1 Contact A / Tip (T)	Dipswitch S5-2 Contact A / Ring (R)	Dipswitch S5-3 Contact B / Ring (R)	Dipswitch S5-4 Contact B / Sleeve (S)
S + R to T	ON	OFF	ON	ON
S to R + T	ON	ON	OFF	ON
R to T (no S)	ON	OFF	ON	OFF
S to R (no T)	OFF	ON	OFF	ON

Table 14.2: Dipswitch S5 configuration

f. Replace the front cover, ensuring the blue gasket is correctly positioned. Insert and tighten the 4 cover screws until the gasket makes contact and the screws are firm.

> **Do not over-tighten the screws. Over-tightening the screws may crack/break the case. Damage caused by over-tightening will not be covered under warranty.**

g. Install 4x AA batteries and the battery cover.
h. Perform all applicable tests (see Test Modes) to ensure system is operating correctly.

14.2 Test Modes

The Kiki Duo system has a number of built-in test functions to allow advanced troubleshooting and performance testing of the various subsystems. All test modes are accessed by holding down Calibrate Sensor and Power/Standby buttons for 3 seconds when turning the unit on. The specific test can be selected by pressing the Calibrate Sensor button once the unit is in test mode. The available tests are listed in Table 14.3. To exit test mode, turn the control unit off by holding the Power/Standby button for 3 seconds.

> If any tests do not meet the pass requirement or if any damage is identified, Immediately remove the system from use. Contact your supplier to for service, maintenance and repair advice.

Note: Warranty will be void if any part of the system is modified or damaged due to negligent repair.

| Test Number	Purpose	Expectation	Pass Requirement
1: LED Test	Verify all LED's operational.	All LEDs on control unit are illuminated.	All LEDs on control unit are illuminated.
2: Audio test (Armed LED illuminated)	Verify correct operation of the local audible alarm.	Clear audible tone. Varies with volume selection.	Continuous 3000Hz (±100Hz) audible tone can be heard. Volume switch adjusts loudness as expected. (Off/Low/High)
3: Relay Output Test (Alarm LED illuminated)	Verify relay operation and configuration of nurse-call output cable.	Relay contacts open/close every 3 seconds.	Relay activates every 3 seconds. Relay contact resistance < 10Ω when closed.
4: Transmitter Test (Sensor Standby LED illuminated) **USE THIS TEST FOR PAGER RANGE TEST**	Verify correct operation of transmitter and pager.	Test message transmitted every 5 seconds.	Pager receives Test message every 5 seconds.
5: Sensor Test (Calibration Required LED illuminated)	Verify Sensor ID and data within acceptable range.	Sensor type correctly identified. Sensor data valid	Sensor ID and data as per Table 14.4.
6: Low Battery Test (Armed LED and Alarm LED illuminated)	Verify low battery level calibration.	Low battery LED indicates correctly. See instruction below.	Low battery LED illuminates when battery level <4.0V (±0.1V)

Table 14.3: Test Modes

Sensor Type	Sensor ID LED	Sensor Data Valid	Sensor Data Invalid
UBS-100 (Blue)	Check Sensor LED	Armed LED	Alarm LED
OBS-100 (Orange)	Sensor Fault LED	Armed LED	Alarm LED

Table 14.4: Sensor Test Details

Performing a Low Battery Test (Test Mode: Test 6)

1. Remove the AA batteries from the control unit and connect a variable DC power supply to the positive (+) and negative (-) terminals as shown. Ensure power supply is set to approximately 6V.
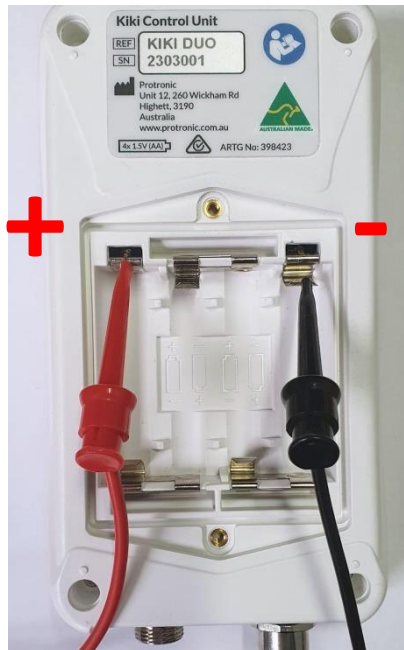
Connect external power supply as shown

2. Enter Test Mode, select Test 6 (Sensor Fault LED illuminated when test mode activated)
3. Low battery LED should be off.
4. Slowly adjust power supply down until Low Battery LED illuminates. The power supply should measure 4.4V (±0.1V).
5. Remove power supply, install batteries and replace battery cover.

Appendix A: Troubleshooting Guide

Issue	Cause	Solution
Control Unit not turning on.	No batteries fitted. AA batteries flat. Batteries fitted but incorrect polarity.	Replace 4x AA batteries ensuring correct polarity.
Repetitive Check Sensor Error.	Patient is not within the detectable range of the sensor.	1. Check the location of the sensor on the bed. 2. Recalibrate the sensor. 3. Over mattress sensor – ensure sensor is only separated from the patient by no more than a sheet.
Nurse-Call System alarm delayed or not triggering with alarm.	Nurse Call Output cable not connected or faulty. System not correctly configured to Nurse Call system.	1. Check cable connection and lead for damage. 2. Confirm Nurse-Call system requirements.
Pager not receiving.	Flat/No battery in pager. Pager not within transmission range. Pager is faulty. Transmitter is faulty.	1. Replace AAA battery in pager. 2. Perform Transmitter test with system in Test Mode. Replace pager if required. 3. Confirm extent of reception range. 4. Contact your supplier for further advice.
Intermittent Sensor Error.	Sensor connector loose or worn. Sensor has developed a fault or broken wire.	1. Check the sensor connection is tight. 2. Replace the Sensor.
Battery life below expectation.	Poor quality or mismatched batteries fitted.	Replace 4x AA batteries with high quality Alkaline cells.

Appendix B: FAQs

Q. How long do the batteries last?

A. Battery life will vary based on the frequency and duration any alarms. A good quality set of alkaline batteries can provide up to 1000 hours (approximately 6 weeks) of continuous monitoring or system standby, or up to 30 hours of continuous alarm state.

Q. What happens if two units alarm at the same time? (applies to paging only)

A. In the very rare occurrence that two units located in close proximity were to alarm at exactly the same time, the wireless transmission to the pagers may corrupt each other. The system is designed to randomly vary the time interval in which repeat messages are sent to avoid further data corruption. This means the pager would still receive the alarm, but it may be on a repeat transmission.

Q. What happens when the batteries go flat?

A. The Kiki Duo System can safely be operated until the Low Battery Alarm is generated. To avoid the inconvenience of requiring an empty bed to recalibrate the sensor once the batteries are replaced, the system remembers the calibration data. So long as the sensor has not been moved from its calibrated position, or disconnected from the control unit, the calibration data will be restored when the control unit is powered back on following battery replacement. If the sensor has been moved, or the sensor data is outside of the expected range, sensor calibration will need to be performed before the system can be armed.

Q. What happens if I place the sensor in the wrong position?

A. Care should be taken to make sure the chosen type of sensor is used in the correct position - over or under the mattress. If the sensor is not positioned correctly on the bed it will not be able to "see" the patient. If the sensor cannot "see" the patient, the system will not allow arming and a Check Sensor error will be generated. Reposition the sensor or patient and attempt arming again. If the error persists, the sensor may need to be recalibrated.

Q. How far does the pager work?

A. The pager range has been measured to be greater than 400m line of sight outdoors. When used indoors the range is expected to be somewhat reduced and will vary by location. Concrete walls, large metal objects and local electrical and RF interference have the greatest impact of the range of the pager. Always perform a pager range test (see 14.2- Test Modes, Test 4) before using the system in a new location. If the range of the pager is inadequate, alternative alerting options may need to be considered.

Q. What do I do if any part of the system is broken or not working correctly?

A. If any part of the system appears to be broken or is not working as expected do not continue to use the device. See the Troubleshooting Guide in the Instructions For Use or contact your supplier for further advice. The system has no user serviceable components.