**BLUE-LINE-ISM**

**(Industrial, Scientific & Medical)**

 **NURSE CALL SYSTEM SPECIFICATION**

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# 1.0 SYSTEM OVERVIEW

1. The system is required to be of modular design, highly reliable with typical and certified 100,000 hour Mean Time Between Failure (MTBF) prime equipment rating thereby ensuring negligible down-time and maintenance costs. The system shall use latest IP and or ISM (Industrial, Scientific & Medical) technology deploying the choice of Area Nodes and/or Wireless Repeaters Whereby Area Nodes may connect to the Head-End via the choice of RS483 or PoE Ethernet switches.
2. Where Wireless Repeaters are deployed it shall be possible to provide multi-hop call delivery and call acknowledgment communication without loss of call traffic.
3. The system shall be Server (computer) based including SQL server capability and with adequate back-up capability to provide an automatic changeover to a fully functional back-up system database operation which having activated will automatically send an emailed advice to the Service provider. It shall also include the ability to provide an electronic “lifeboat” back-up operation at room level whereby optional over-door lights will operate independently from the overall system and heads-end facilities.
4. To allow the Facility Developer to give consideration to equipment and facilities that may be new or otherwise have not been specifically scheduled or quantified within this specification and associated drawings the tenderer is required to provide a list of such equipment and facilities that the tenderer considers to be worthy of consideration for inclusion. This may be in the form of a catalogue with indicative prices or preferably in the form of an ‘options schedule’ but such non specified items and/or facilities must not be included in the system bill of materials list or costs unless so specified herein.
5. The proposed system shall exploit the benefits of various latest technologies to provide the client with optimum system flexibility including future up-grade progress paths that shall not necessitate additional room, area or backbone cabling.
6. Those various technologies shall include latest Bluetooth-BLE and IoT technologies and shall work seamlessly, operating on a separate single platform and shall include but not be limited to the following :- RTLS, Staff Presence, Staff Duress Resident Falls detection and perimeter Gate safe containment.

## 1.1 Call-point communication infrastructure

(a) The system shall be based on the use of RCM approved ISM (Industrial, Scientific & Medical) fully supervised (two-way) communication whereby calls generated from a call-point or portable pendant. Such generated calls shall respond with the required reassurance flashing LED only upon confirmation response of the call having been accepted and identified by the system Head-end Node and/or supplementary Nodes and/or repeaters processing the call traffic.

**1.2 Inclusion of Bluetooth controlled RTLS, Duress & Presence monitoring**

The system shall be capable of being initially supplied with and/or capable of being retrofitted with RTLS (Real Time Location System) tracking of Patients/Residents, Carers, Service Providers or Assets. This facility shall also support monitoring and management of Staff Duress, Resident Falls/Help and/or the monitoring and recording of any such Tag wearer ‘Presence’ to suit various reporting requirements.

**1.3** Wireless overlay ‘Safe-T-Net’

(a) The system shall include a seamless capability to also accommodate the site-wide ability to process wireless traffic from portable pendant devices having the ability to also provide Cancel, Staff Assist and (optional) Falls Detection for Residents and Duress calls from Staff.

(b) The system shall be capable of supporting future requirements for Pin-Point location RTLS and Duress via the original call-point infrastructure without the need for additional wireless or cabled communications infrastructure.

## 1.4 Emergency-Call (ILU) Telephone interconnection

 (a) The system shall have the ability to accept PERS (Personal Emergency Response System) emergency call traffic via a telephone connection or 3G/4G modem. Such traffic would typically originate from self-care independent living units (ILU) or similar out-reach clients using such fixed telephone line and/or portable 3G/4G devices.

 (b) Such PERS fixed devices shall totally comply with and be duly certified for Standard AS4607 and NBN requirements including the required 3G/4G back-up facility.

 (c) Such compatible PERS Head-End input equipment can be included as an optional item but excluded from the prime Bill of Materials.

## 1.5 Computer Technology

(a) The system shall be computer based using a robust industrial grade solid state computer that has no moving parts and will operate from the central equipment battery backed power source having input voltage range from12v-36vdc. It shall be provided with full SQL server capabilities and no less than 4GB RAM and 128GB SSD and shall include an embedded Windows10 or later operating system in addition to the nurse-call software program. The Server shall have certified 100,000 hour MTBF reliability rating.

(b) Partitioning shall be employed whereby the total database is duplicated as described below.

(c) The choice of 1RU rack mounting or Fan less extruded aluminum alloy ‘heat sink’ cabinet will be selected to best suit the application.

## 1.6 Nurse-Call Software Overview

##  (a) The Host computer nurse call software program shall have an integral automatic database changeover facility with suitable alerting ability to ensure continuity of operation in the event of database corruption or similar malfunction. Both databases shall share the same on-board back-up folder.

(b) The database shall automatically be backed-up to a programmed location on regular programmed intervals and such back-up shall include all fixed and variable data (the latter including call-traffic logs etc.)

(c) In addition to the local back-up detailed in (b) above it shall also be possible for each site to automatically include an upload of each back-up file to the Service Provider’s (and/or end user client’s) secure off-site drop-box location ‘in the cloud’.

(d) The system software shall support Browser requirements thereby allowing PCs within a facility the ability to browse the Nurse-Call Server allowing access in accordance with appropriate password protection.

(e) The software database shall be capable of accommodating up to 10,000 clients (input devices) each having up to 8 sub-identities (zones) with each client and zone being uniquely identified for distribution, display and reporting purposes.

(f) It shall be possible to extend the total facilities of the Host computer and its display facilities with or without the need for keyboard and mouse to operate (under password security) at selected Nurse Station locations. The screen at those locations shall be 22” and include audio speakers in order to truly reproduce the various priority audible alerts that occur with incoming and repeat call traffic.

(g) The computer software will provide formatted Management Reporting Facilities that shall assist in the preparation of documentation for the purposes of matters relating to operational efficiencies, care-plan management and accreditation funding.

(h) The computer software will include the following Reporting attributes in support of (g) above,

 (i) Time & Date stamped incoming call log

 (ii) Time & Date stamped outgoing call log, indicating each device contacted and text included,

 (iii) Time and Date stamped exception/diagnostic report log

 (iv) Report all calls and elapsed time for the cancel for each location for select period

 (v) Report all calls and elapsed time for all calls that exceeded a preset ‘acceptable’ elapsed time

 (vi) As above for each selected on-site and/or off-site location

 (vii) Report call priority traffic per location (i.e. Normal, Staff Assist & Emergency)

1. The nurse call software will include the ability to provide a period selectable ‘Site Audit Report’ to identify all call-points or other connected devices that have not been activated within the selected ‘build’ period. This shall also include the ability to identify the ‘last used’ time and date of each such device.
2. The software will have the ability to include a wide range of input and output signaling paths as specified elsewhere herein.
3. It shall be possible for periodic Reports to be manually or automatically dispatched by email to predetermined email address/s.

# 2.0 OVERVIEW OF OUTGOING PAGING TRAFFIC

## 2.1 Group and Selective Paging

(a) The system shall be capable of simultaneously outputting information to various forms of display and recording devices including but not limited to those listed herein.

(b) Irrespective of the choice of paging technologies the system shall be capable of:-

 (i) Establishing no less than 50 paging groups

 (ii) Including no less than 100 devices of different paging technologies within each paging group

 (iii) To accommodate specific repeat paging intervals for calls that have exceeded the set cancel time

(iv) To provide no less than two levels of call escalation to generate problem awareness calls.

(v) To accommodate manually compiled text messages to selective or paging groups with such facilities also being available from nurse stations where password access allows.

(vi) To allow connected nurse stations to view graphic displays for Pin-Point Duress & RTLS.

## 2.2 On-site POCSAG paging system

(a) If included elsewhere herein the on-site paging facilities shall extend to the perimeters of the total site and shall use standard international POCSAG protocol. The appropriate choice of VHF or and UHF bands shall be selected.

(b) A quantity of (xxx) robust 4-line display wireless pagers with holsters shall be included and the price for each shall be identified.

## 2.3 Off-site paging arrangements

(a) It is required that diagnostic, duress and escalated calls be directed as text messages to selected mobile phones irrespective of those phones being on-site or off-site. It is therefore required that the host computer be internally equipped with the latest (i.e.4G) modem with suitable SIM card fitted but service contract requirements to be arranged by the client. Removable USB ‘Dongle” modems will not be considered.

(b) This off-site paging facility shall be shown as an option and priced as a separate computer facility.

## 2.4 Annunciator displays

 (a) Fully and independently addressable Annunciator displays with integral audible tone generation will use 16 x 50mm character multi-color moving LED text display screens and shall be controlled via the Host Computer communicating with an Annunciator Controller. Single and double-sided displays will be provided as appropriate to site drawing nominated location requirements.

 (b) It will be possible to deliver daily or compiled scrolled text messages for ‘fall-back’ intervals where no call-system traffic is in progress.

 (c) Display colors and tone cadence rates shall be in accordance with standard AS3811.

 (d) Annunciator displays shall have day and night duty volume control via the Host Computer and each Annunciator shall have a convenient but inconspicuous volume control to suit precise location operation. It shall be possible by programming for the host computer to reduce the tone volume to zero during night duty periods.

 (e) Selected Annunciators shall function as a ‘system watchdog’ in order to identify a ‘System Down’ condition with appropriate tone cadence and fast flashing red display.

 (f) In the event of a system down condition it shall be possible for the Annunciator Controller to trigger a contact that will generate alternative forms of alert such as a telephone dialer, strobe light or similar.

 (g) As identified within drawings fully addressable ‘Tone only’ Annunciator devices (using all of the normal tone sequences) will be connected to the network as required for locations where staff need to be alerted where displays are not visible.

 (h) Annunciators shall have the ability to operate via the site’s POCSAG paging system in order to accommodate such displays in difficult to cable locations or other buildings.

## 2.5 DECT portable telephones

 (a) The host computer shall have the ability to provide an integral software interface to allow SMS communication with an Industry Standard DECT telephone controller preferably of Kirk/Spectralink manufacture. The system will deliver alphanumeric text messages to one, some or all DECT handsets as required.

 (b) If offering DECT the quantity of DECT phone ’Base Stations’ shall be estimated from drawings and the tenderer shall identify the cost of supply and installation of a typical base station in order to accommodate variation of required quantities during building construction.

(c) A quantity of [xxx] handsets complete with battery and charging/docking station shall be included in the bill of materials and the model number and price for each shall be identified.

## 2.6 Wi-Fi portable telephones

(a) Preference will be given to systems that include the ability for the Host Computer to integrally support a message centre capability that will allow direct text messages to be delivered into the site’s Wi-Fi system for delivery of the appropriate call system text messages to the selected mobile smart-phone handsets as determined within the system’s paging group arrangements.

(b) The Smart-Phone (Wi-Fi) handsets shall deploy an Android operating system, be robust in terms of shockproof and waterproof to IP67 rating with a suitable APP program to allow colour icon displays which identify the type and priority of the incoming call along with the text message.

(c) The APP shall be as typically deployed within healthcare with inappropriate functions deleted from use.

(d) Mobile phones shall be capable of switching between on-site Wi-Fi and externally provided network services (SIM cards and associated service costs will be the responsibility of the Client).

## 2.7 Wide area paging to mobile phones

 The system shall be capable of delivering alphanumeric display messages via a 4G modem installed within the Host Computer. The price for this item shall be shown separately excluding the cost of the SIM card RSP service.

## 2.8 Logging printer

 The system shall include the ability to connect to a dedicated and/or network printer.

# 3.0 ISM CALL-POINTS

## 3.1 Master Call-Points-General

1. All master call-points within the Resident/Patient’s living area, wet area and all communal locations shall be compatible with Clipsal 2000 series face-plate wall mounting accessories and shall be of similar appearance throughout the site in order to assist Residents/Patients to easily identify purpose.
2. All Master call points shall use ISM technology as is appropriate to ACMA regulations and provide the option of integral battery or 12v externally applied voltage supply.
3. All such call-points including those allocated for non-Resident/Patient use including but not limited to applications such as front door and Duress applications shall be capable of reporting low battery and/or other detected ‘trouble’ issues.

## 3.2 Bed-head call-points

Bed-head call-points shall function as the Room Controller (or Area Controller where located within communal areas) allowing a variety of supervised slave call-points or accessory devices to be connected and to provide at a minimum the following attributes:-

* Green Anti-Fungal, Anti Bacterial call button with multiple light-touch micro-switch
* Back lit call-button (when operating in externally powered mode)
* Braille button marking for those with sight impairment
* Call-Point cleaning capability with 15 second call-activation ‘time out’ facility
* Small grey and relatively inconspicuous cancel button
* Robust 6.3mm over-bed cord pendant jack
* Ability to identify a cord pendant disconnection or tamper attempt
* Flashing LED ‘call in progress’ reassurance with flash rate appropriate to call-priority rate (when externally powered) or brief (20 second) LED flash when relying on battery power
* Momentary piezo audible alert for Resident/Patient (single beep) or Staff Assist (double beep) call
* Provide genuine ‘Staff Assist’ call by Staff pressing both call and cancel buttons simultaneously
* Provides up to 8 database identification codes to identify alarmed connected device
* Accommodates up to 2 slave call-point devices each with additional unique database identification
* Integral UHF 4-channel wireless input receiver option each with unique database identification
* Identifies within database and display devices call-point button or pendant button alarm activation
* Accommodates plug-in Bluetooth-BLE module for Presence, Duress, and RTLS applications
* Drives all room and ensuite LED circuits including over-door (Corridor) LED display.
* Accommodates control via over-bed cord pendant an optional relay for 240v light switching circuit.

**3.3 ILU Specific Call-Point including ILU Communications Hub**

 (a) All Independent Living Units (ILUs) shall include a special ISM Call Point that shall also act as a communications hub for the receipt and processing of up to 4 separate UHF wireless devices or accessories located throughout the ILU. Such devices will include the following requirements:-

* To act as a normal ISM call-point with Call, Cancel & Staff Assist functions (as specified above)
* To be capable of uniquely identifying up to 4 separate wireless devices with unique identification
* To be plug-pack (or 12v externally) powered with Power Fail reporting to the head-end system
* To have battery back-up for no less than 16 hours
* To be able to dispatch daily test calls and for the head-end to identify failure to communicate
* To have the ability to include the Bluetooth Options listed elsewhere herein

## 3.4 Resident/Patient Hands-Free Call Trigger by Wireless

(a) Each bedside and communal dry area call-point shall include an integral wireless receiver module that will trigger the call-point with a unique database identification in the event of the Resident/Patient activating a wrist or neck worn personal emergency transmitter (PET) or to accommodate a wireless based sensor device.

(b) The receiver shall permanently memorize the programmed code data unless deleted or overwritten.

(c) The wireless Personal Emergency Transmitter (PET) shall use the approved 304Mhz UHF carrier frequency and this transmitter module shall be common to various bedside sensors to accommodate the preference for a ‘cordless bedside environment’.

## 3.5 Call-point ‘Staff Assist’ function

(a) Each two-button call-point throughout the site, irrespective of it being a master call-point or slave call-point, shall be able to dispatch higher priority ‘Staff Assist’ calls at any time, (i.e. whether a prior Resident/Patient alarm from that call-point is in progress or not). This shall be possible by the Carer/Nurse pressing the call and cancel buttons simultaneously.

(b) Verification of the ‘Staff Assist’ level call having been dispatched shall be via the call-point’s reassurance LED indicator and the over-door LED indicator each flashing at the ‘dual flash’ cadence rate. Reassurance shall also be provided via a brief two-burst fast cadence piezo audio response from the call-point.

(c) Specific Staff Assist call-points with yellow ‘Assist’ buttons shall not be used within the Aged Care facility but is essential for Hospital applications and shall be included only as applicable.

## 3.6 Call-point programmability

(a) Any master call-point shall be capable of being remotely programmed to provide any of the available prime levels of priority. The programming shall also be user accessible via the computer terminal and changing priority levels shall not require the removal of call-points from the wall.

(b) It shall therefore be possible for a call-point priority level to be upgraded on a temporary basis via a computer keyboard thereby allowing staff to provide priority attention to a sick Resident/Patient or one that is accident-prone or recuperating from a surgical intervention.

(c) The required basic levels of priority include the following: -

* Resident/Patient Call
* Assist Call
* Emergency call (i.e. code blue or similar)
* Duress call

## 3.7 Call-point audible reassurance

Each Master and Slave call point shall be designed to accommodate a low audio level piezo momentary alert device that will provide Resident/Patient reassurance of the call being processed when unable to see the call-point’s LED reassurance. (e.g. when using the over-bed cord pendant).

## 3.8 Over-bed cord pendant

(a) The cord pendant shall use an anti-bacterial, anti fungal call button with suitable Braille marking and be of waterproof silicon construction thereby being suited to infection control and hygienic operation. It shall include a robust 3 Meter cord with right angled cable entry 6.3mm jack.

(b) Where pendant light switching is specified the applicable cord pendant shall also include a momentary light switch button contained beneath the silicon material and suitably labeled.

1. In order to avoid problems due to accidental or intentional disconnection of the pendant jack from its socket shall cause a Resident/Patient level alarm call to be dispatched to the head-end also identifying the ‘Pendant out’ cause of the alarm.

## 3.9 Patient Entertainment Handsets- for Hospitals

 (a) The system shall be capable of supporting Patient Entertainment Handsets which shall be lightweight, be of silicon waterproof construction and have the following controls:-

* Up-Down TV Channel selection
* Up Down volume control
* Momentary light switch toggle button
* Nurse call button
* Speaker and earphone socket (with waterproof plug)

 (b) Entertainment handsets are not required for aged Care facilities where the Aged Care ACT specifies that a Resident shall enjoy a ‘Homelike Environment’ and not a Hospital Environment.

**3.10 Slave Call-Points with Unique Identification**

(a) Any call-point device connected to a Master ISM call point shall provide up to 2 unique client codes (database identifications) and shall include the normal attributes as its Master call-point in terms of possible over-door LED control etc.

(b) Slave call-points are required to accommodate the following range of functions merely by connection to the Master ISM call-point.

(c) As identified below Slave Call-points shall have no less operational functions than the Master ISM call-point to which it is connected including the following:-

* Green back-lit Anti-Fungal, Anti Bacterial call button with multiple light-touch micro-switch action,
* Call-Point cleaning capability with 15 second call-activation time out
* Small grey inconspicuous cancel button,
* 6.3mm over-bed cord pendant jack with “cord disconnect” alarm
* Flashing LED ‘call in progress’ reassurance with flashing rate appropriate to call-priority rate.
* Provides momentary piezo audible alert of Resident/Patient or staff Assist call being activated,
* Provides “Staff Assist” call by Staff pressing both call and cancel buttons simultaneously,
* Provides connections to activate an optional hands-free two-way VoIP/SIP speech module,
* Provides integral UHF wireless receiver ‘call trigger option’ with unique database identification,
* Identifies within database and display devices call-point button or pendant button alarm activation,
* Identifies cord pendant disconnection with anti-tamper capability,
* Accommodates optional Bluetooth-BLE module for Presence, Duress, and RTLS applications
* Controls all room and ensuite LED circuits including over-door/Corridor LED display.
* Control via over-bed cord pendant the Isolation Relay for 240v light switching circuit

## 3.11 Ensuite Toilet call-point

 (a) Although the Ensuite call-point can be a Master ISM Call-Point or Slave call-point the following specification identifies it to be a slave Call-Point operating via the parent master ISM call-point.

(b) The call-point shall be waterproof to standard IP65 (‘water-jet’) and be installed on the wall 600mm AFL and 150mm from the front of the toilet seat and located beyond the toilet roll position. It shall include full ‘clone’ functions of its parent bedside call-point whereby it will allow call, cancel and assist calls. Although being a Slave connection to the bedside Call-Point (room controller) it shall possess its prime unique client code identification within the system head-end database.

(c) The call-point shall use Anti-Bacterial, Anti-Fungal silicon Call button with Braille marking.

(d) The toilet call-point shall have slave connection capability to accommodate a momentary alarm button fitted within the toilet pull-down grab-rail, that grab-rail. The Grab Rail call button with its ‘within rail’ flexible lead and suitably configured connection to suit grab-rail movement cable wear-and-tear shall be supplied by others.

1. The toilet call-point shall have slave connection capability to accommodate a momentary alarm button fitted within the shower recess being either a pull-cord or waterproof wall-mounted version having standard two button functionality (i.e. Call, Cancel and Assist) as shown in drawings.

## 3.12 Ensuite shower call-point (wall mounted version)

(a) Where the shower call-point is to be wall-mounted, it shall have similar appearance to that located at the toilet and shall be a slave call-point possessing both ‘call’ and ‘cancel’ buttons (and by association allowing the ‘Assist’ functionality) and shall include LED reassurance and the assembly. It shall be waterproof to IP65 (water-jet) standard.

(b) The call-point shall be mounted on the tiles or wall at 650mm-700mm AFL and the contractor shall be responsible for ensuring a waterproof fitting using a small fillet of silicon rubber to the top and sides (only) of all ensuite call points. The particular type of silicon rubber shall be ‘neutral-cure mould resistant’ in either white or clear to suit the background.

(c) The wall mounted slave shower call-point shall connect to the system via the toilet call-point but shall have the ability to be specifically identified at the head-end database for message distribution, logging and reporting requirements.

## 3.13 Ensuite shower call-point – (pull cord)

(a) Where the tenderer is to propose a ‘pull cord’ in lieu of the wall-mounted two-button version as described above, it shall include a 10kg break-strain link that may be easily replaced without tools or the need to untie or tie knots. It shall include a pear-shaped hand piece at the end of the cord similar to that used for the over-bed cord pendant and shall hang to 700mm AFL.

(b) The switching mechanism shall be of commercial quality design and construction and shall be encased within a plastic enclosure to avoid the ingress of dust, steam or high humidity environments.

(c) The call point shall be momentarily triggered from 100gm cord weight and will latch a bright 10mm red reassurance LED at the ceiling faceplate.

1. The ceiling mount call point shall be cancelled or upgraded to “Assist” level priority from the toilet or bedside call-point.

## 3.14 LED cadence arrangements for Ensuite Alarms

(a) An Ensuite call-point shall have a dedicated over-door LED of different colour from the bedside triggered LED and, as applicable to all over-door LED assemblies each LED shall flash at the appropriate cadence to identify the priority level of the call in progress.

## 3.15 Staff Assist & Emergency call-points

##  (a) The standard IP Call-Point and/or its Slave equivalent versions as described in above clauses will also accommodate a Yellow Staff Assist or Red Emergency alternative coloured call-buttons. Where such dedicated use is necessary (i.e.as in Hospitals) the appropriate dipswitch setting and/or database setup will provide the required level of priority.

 (b) All call-points, irrespective of precise function will have identical circuits, firmware and components other than the provision of the 6.3mm pendant jack applicable to bedside locations and the appropriate call button colour and wording.

 (c) As all Master and Slave call-points will have the ability to despatch a genuine Staff Assist call and as this and the Emergency call-points are intended for Hospital Applications neither Assist nor Emergency call-points having appropriate button identification or colours will be required when used for Aged Care applications where .the Aged Care ACT specifies that a ‘homelike environment’ and not a Hospital environment shall be provided.

## 3.16 240v Light Switching Option

It shall be possible for any master or slave bedside call-point (i.e. fitted with a 6.3mm) cord pendant socket to be able to toggle an associated isolated relay ‘light switch’ controlled via a connected cord pendant having the momentary light switch function.

## 3.17 Bed-Exit monitoring facilities

(a) Each room shall include a bedside accessory connection plate cabled behind the wall surface to connect to the Bedside call-point’s internal press-release terminal block provided for the connection of such accessories. These typically include a bed exit floor mat, Bed Exit PIR or within bed occupancy sensor. .

(b) In order to avoid the use of plug-packs at the bed-head the above mentioned connection plate shall include an RJ45 socket allowing the connection of accessories that require 12v dc battery backed power from the nurse call system in addition to a robust 6.3mm socket to suit non-powered sensors such as a floor mat.

(c) For rooms that are not Dementia Specific the connection plate will also include an arm/disarm switch with LED indicator to allow the bed-side accessories to be armed or disarmed manually.

(d) In addition to manual arming and disarming the bed-side accessories it shall also be possible to do so via head-end computer keystroke adjustment and/or set duty cycle per bed.

## 3.18 Carer/Nurse Presence Monitoring, Logging & Reporting

(a) Where identified within drawings it shall be possible to install a ‘Presence’ call-point inside the door within the Resident/Patient’s room. This will allow the Carer/Nurse to cancel the call either manually or (if so arranged) via a close proximity Bluetooth-BLE transaction between the Presence call-point and the Carer/Nurse’s personal Bluetooth tag, key-ring device or name label etc.

(b) The latter Bluetooth option shall:-

(i) Detect (and beep) at a Carer/Nurse’s proximity to an alarmed room

(ii) Despatch to the head-end the Carer/Nurse’s identification and presence start time as they cancel the call,

(iii) Trigger an over-door (corridor) Presence (blue LED)

(iv) Send the Presence call to the appropriate paging group if so programmed to do so.

(c) Pressing the cancel button on the Presence call-point upon leaving the room shall:-

(i) Switch off the over-door Presence LED

(ii) Log the exit time and elapsed time of that Presence event for that person in that room.

(iii) It shall also be possible to cancel the Presence timer by bringing the Bluetooth tag (name badge) in close proximity to the Presence call-point.

**Note-** The tenderer shall include a manual Presence call-point within the quoted bill of materials and shall identify the additional cost to include the Bluetooth enhancement option (See following clause).

## 3.19 Carer/Nurse Identification for Presence & Duress (Bluetooth Option)

(a)  **Presence**. The tenderer is invited to offer the option of allowing a Carer/Nurse to carry a Bluetooth identification device that, when in close proximity to a Presence or other Bluetooth equipped device, will accommodate the following desirable requirements.

 (i) To automatically identify and time/date stamp the attendance of a Staff member that attends an alarmed room or location. This shall be achieved automatically via an entry located Presence call-point that has its alarm LED flashing in consequence of a call in progress from that room or Ensuite.

 (ii) Automatically send a cancel call to cancel the call in progress (if so programmed, otherwise requiring the Staff member to cancel the call from the original Call-point).

 (iii) Activate a Blue colored ‘Presence’ LED in the corridor,

(iv) Upon the staff member leaving the location will send a cancel call to the head-end to terminate the Presence elapsed time entry and to extinguish the corridor LED indicator.

(b) **Duress**. Upon the Staff Member pressing the optional alarm button on their Bluetooth tag device the system will process a pin-point location ‘Duress alarm’ via that Presence call-point or any other Bluetooth Locator equipped device, which can include any master or slave call-point or Minder Dementia control panel located throughout the site.

(c) The Host computer will provide separate logging and reporting modules in order to suitably accommodate both Presence and Duress activities thereby providing meaningful activity and incident reports.

**4.0 COMMUNAL AREA CALL-POINTS**

## 4.1 Interior ‘Dry Area’ call-points

(a) Communal area call-points in the dry areas shall be identical to the bedside call-point with the exception of the 6.3mm cord pendant socket, which will not be required unless otherwise specified.

(b) Communal area call points shall also have the ability to control up to 4 connected slave call-points in addition to being able to control over-door LED assemblies as would be used with communal area toilets.

(c) Communal area call-points shall have an optional wireless receiver-operating mode that will trigger a location alarm in the event of any Resident/Patient’s (short haul 304Mhz) wireless pendant being activated within approximately 12M of the call-point. This facility will identify a location where a Resident/Patient is seeking help and is unable to locate or reach a fixed call-point.

## 4.2 Interior and exterior ‘Wet Area’ call-points

(a) Communal area call-points in the ‘wet’ and/or weather-exposed areas shall have the same appearance, and waterproof standards and operation as the Ensuite call-points described elsewhere herein.

# 5.0 USE OF ISM PORTABLE PENDANTS

## 5.1 Overview use of portable devices

(a) ISM Configured wearable devices shall include Pendants and wrist bracelet types.

(b) Pendants shall have a free space range of approximately 300M and shall allow battery replacement.

(c) The pendant devices shall include Call, Cancel and Assist via a single button and shall include an accelerometer device to allow Fall detection if so required.

(d) It shall be possible for multiple sited Repeaters to determine proximity of a portable pendant alarm condition and for the head-end to identify the Repeater that accepted the call.

# 6.0 OVERDOOR LIGHTS

## 6.1 Over-door light functions

(a) Each bed-head master call-point shall be capable of controlling the corridor light assembly, the latter comprising the required number of super-bright LEDs encased within opaque lens assemblies being coloured Yellow, for normal rooms or Yellow, Green and Red for dementia rooms. Blue LED lens assemblies shall be used where the site requires Nurse-Presence facilities.

(b) An over-door LED assembly shall use 5mm super-bright LEDs with suitably coloured 360 degree diffuser caps and be located within the corridor ceiling outside of each room whereby its position shall allow clear view by Staff from each direction along the corridor. Over-door LED assemblies shall also be located outside toilets, assisted bath and other locations as identified within the drawings.

(c) In order to comply with the Aged Care ACT requiring aged care facilities to provide a ‘Homelike Environment’, large and/or otherwise conspicuous over-door lights will not be considered.

(d) The yellow LED shall function as follows:-

* Slow flashing yellow (Resident/Patient Call),
* Fast flashing yellow, a Staff Assist condition,
* Where ISM call-points are battery operated it shall be possible for the call-point to remotely trigger the overdoor light assembly via wireless communication in which case the overdoor light assembly will be 12v externally powered,

# 7.0 MONITORING OF PLANT & EQUIPMENT VIA CONNECTION TO ISM NODE

## 7.1 Monitoring of Plant, Equipment & Ancillary Devices

All miscellaneous devices that provide normally open or normally closed contact activation if not conveniently connected to an IP master or Smart-Slave input shall preferably also form part of the overall ISM infrastructure by its connect to one or more Blueline-ISM Nodes for processing within the Nurse-Call facilities.

Such connections shall use CAT5/6 cable and be terminated via RJ45 connections at the Node location thereby also allowing 12v supply to be extended to such miscellaneous devices if so required.

Such typical connections can typically include :-

(a) **Fire Panel** (Unless usingHigh level RS232 data input),

(b) **Refrigeration** Over-temperature (contacts to be provided by others),

(c) **Front door** Front doorbell as input to the nurse-call and paging system,

(d) **Trade Door** miscellaneous as required

(e) **Lift/s** Passenger call & breakdown alarms,

(f) **Security** Security panels and sensors,

(g) **Sprinkler** Pressure detection

(h) **Other** Other applications current and future

# 8.0 HIGH LEVEL INTERFACE

## 8.1 Serial interface to fire panel - IP

(a) In the advent that the Fire Panel is able to deliver a TCP/IP output it is then required that the interface to the nurse-call system shall accommodate this connection. If the Fire Panel is unable to deliver such signalling protocol an RS232/RS485 interface connection shall be provided at the Head-End as part of the nurse call system.

(b) The nurse-call system shall ensure that all fire-panel alarm traffic by description and location is displayed at Nurse Stations, on Pagers, Annunciator displays and DECT, Wi-Fi (or similar) phones. Fire alarms shall be logged with date and time stamp within the host computer log file.

# 9.0 SUB SYSTEM INTEGRATION

## 9.1 Mobicall, Connexall & similar middleware integration

(a) The tenderer is invited to propose a technique whereby it is possible to suitably integrate other systems and/or sub systems listed within the overall site facilities that can be merged with the nurse call system via a single and proven middleware platform.

(b) The middleware program shall be accommodated within the nurse-call system host computer and shall not be located on a separate computer.

(b) It shall not compromise the safe and reliable operation of the nurse call system or the dedicated Nurse-Call LAN.

## 9.2 Wandering Resident/Patient Door Exit Reporting

The system shall be able to accommodate field induction or similar door protection facilities whereby a Resident/Patient wearing a special wireless tag shall trigger that door station to send an alarm to the nurse call system. The alarm shall not be sent unless the door is subsequently opened within a programmed interval or in the event of an accompanying Carer/Nurse using a by-pass switch which shall be provided within the system.

One such door protection system shall be included in the bill of materials and located as shown in the drawings. The cost of installing additional door protection units shall be listed in the options schedule for further consideration.

# 10.0 ‘SAFE-T-NET’ SITE-WIDE WIRELESS RECEPTION UMBRELLA

## 10.1 Comprehensive wireless facilities

(a) The central equipment and hard-wired system infrastructure shall, from the outset, be capable of accommodating the signal processing of wireless personal emergency transmitters (PETs) plus wireless Call-Points and/or transportable room dementia or other wireless devices that may be deemed necessary from time to time or to meet current or future requirements.

(b) The wireless infrastructure shall avoid the site’s Wi-Fi infrastructure and will instead use the protected and approved long range wireless ISM (Industrial, Scientific and Medical) frequency bands.

**10.2 Wireless Nodes**

 (a) The Head-End equipment shall include an ISM Wireless Node suitable for the reception of all wireless traffic intended for system head-end processing.

 (b) A wireless Node operating via the Nurse Call LAN and connected to a PoE Ethernet switch shall be located in each wing of each floor of the site in order to capture and process all ISM wireless traffic.

 (c) It is understood that additional Nodes may be required in order to provide reliable wireless coverage of the total site. It is therefore necessary to identify the typical cost of additional Nodes as may be required.

## 10.3 Wireless transmitters (Fixed Location)

(a) All wireless transmitting devices shall operate on the recommended UHF ISM frequencies and shall operate in compliance with relevant Australian Standards.

(b) Transmitters required to be battery operated such as personal emergency transmitters (PETS) shall use Lithium batteries with useful battery life representing 8,000 transmissions each of 2-second duration (or equivalent). Batteries shall have a typical shelf life of no less than 5 years and shall identify both locally and via the ISM wireless network the occurrence of meeting a low battery threshold.

(c) Fixed location wireless call-points shall have identical appearance, functionality and operating requirements as the equivalent hard-wired (IP) versions and it should not be possible for users to be able to detect the difference.

(d) Fixed location Wireless transmitter types shall include but not be limited to the following:-

* Pendant transmitter with neck cord or chain 304Mhz or ISM UHF bands ,
* Wrist transmitter with wrist strap 304Mhz or ISM UHF bands
* Pocket/belt clip transmitter with “person-down” (Fall detection) automatic alarm ISM UHF band
* Fixed (wall-mounting) versions with Call, Cancel and Assist facilities ISM UHF band
* Fixed (wall-mounting) as above but waterproof to IP65 standard ISM UHF band

(e) Insertable miniature transmitter modules to be located within accessories or devices and powered by those devices to be used for triggering wireless alert calls within the ISM wireless umbrella facility and shall include but not be limited to:-

* Smoke and other environmental wireless detectors 304Mhz or ISM UHF bands.
* Passive Infrared (PIR) and other security wireless detectors 304Mhz or ISM UHF bands.
* For connection within PERS (Personal Emergency Response System) Telephone/Dialler/3G ILU based products to both (a) Trigger that device, and/or to send a wireless alerting call into the ISM wireless umbrella network should that PERS product go into an alarm condition(i.e. Backup communication path to the head-end).

## 10.4 Wireless transmitters (Portable)

 (a) Portable pendant or wrist worn Personal Emergency Transmitter (PET). There is a requirement for long range wireless pendants having a single call button that will allow the Resident/Patient to generate a personal identifiable alarm call from any location throughout the site.

 (b) That single button PET device shall also automatically generate a ‘Fall’ incident alert whilst also allowing the Resident/Patient the ability to cancel a ‘Fall alert’ prior to its transmission if considered invalid.

(c) The attending Staff member shall also be able to despatch a Cancel call or a Staff Assist call from that PET device without the need for the PET to have multiple push buttons which would confuse the Resident/Patient in terms of its prime use.

(d) The same Pendant (PET) may also be issued to staff for Duress applications however, Bluetooth-BLE activated Duress monitoring is preferred – as described elsewhere herein.

(e) A total of [xxx] Resident/Patient and Carer/Nurse Long Range Personal Emergency Transmitters (PETs) shall be included in the bill of materials and the cost for additional units is to be identified.

# 11.0 ANNUNCIATOR DISPLAYS

## 11.1 Audio/Visual special effects for Annunciator displays

A choice of single and/or double sided 16 x 50mm character independently addressable displays should be offered with an alternative proposal of 8-character versions if considered adequate for the purpose.

(a) Annunciator displays shall be located in the corridors as shown within the site drawings and shall operate from the site-wide paging system by either RS485 hard-wired or POCSAG wireless reception. However, radio paging communication to Annunciator displays shall only be used when extending the Annunciator display network to ‘other buildings’.

(b) It shall be possible to install both single and double-sided Annunciator displays each with integral audio signalling. Up to sixteen displays may operate from a single display controller cable run.

(c) The display control unit, in addition to processing visual calls to its family of display units, will provide the appropriate display message and audible tones to each of the addressable display units as appropriate.

(d) The volume level of the call tones will be determined both by the host computer which shall determine the day and night duty cycle volume levels in addition to the manually pre-set controls that allow precise adjustment for the day and night volume levels per controller and extension speaker location.

(e) Each display will include an internal speaker with independent volume control and the Annunciator display controller network shall provide the ability to connect extension speakers as required.

1. Stand-alone speaker-only devices will be connected to the Annunciator display network and located in in working Utility rooms, Arts and Crafts room etc (as shown on drawings) where Staff are unable to view a corridor display.

## 11.2 Audio/Visual special effects for Annunciator displays

(a)`Whereas an ‘idle’ or ‘fall-back’ message will occupy the Annunciator display screens in the event of no displayed traffic, each type and priority of incoming calls shall be displayed in accordance with the following table:-

|  |  |  |  |
| --- | --- | --- | --- |
| **PRIORITY**  | **DESCRIPTION** | **VISUAL EFFECT** | **AUDIO EFFECT** |
| 1 | Emergency Alarm | Fast flash – Red | Repeat beeps until cleared  |
| 2 | Nurse Assist Alarm | Fast flash – Yellow | Double beep |
| 3 | Wet Area Alarm | Steady – Yellow | Double beep |
| 4 | Normal Alarm | Steady – Yellow | Single beep |
| 5 | Diagnostic Alarm | Steady – Brown | Single beep |
| 6 | Idle Message | Scrolling- Green | No beep |

(b) It shall be possible for the Displays to show real time using AM & PM option and the time shall update at each minute interval.

## 11.3 Use of Display Screens via Wi-Fi network

 (a) It shall be possible to include cable less connections to LCD display screens and-or Smart TVs and/or Tablets to be deployed as Annunciator displays capable of displaying line by line or graphic floor layout displays with call-traffic being clearly identified via suitable icon identifiers.

# 12.0 DEMENTIA ROOM MONITORING REQUIREMENTS

## 12.1 Room Monitoring Requirements

##  (a) Each room within the Dementia Wing will be provided with a ‘Minder’ facility that will include the following interconnected items:-

* Minder Arm/Disarm control panel at the corridor entrance to room
* Wall mounted Floor Scan PIR each side of the bed with scan limited to end of bed
* Door curtain PIR at exit into corridor
* Ceiling mounted PIR within Ensuite
* Ceiling mounted room scan (option)

(b) The room’s Minder system shall operate via connection to the bedside IP call-point (Room Controller) and all such events and activities shall carry unique identification for specific logging, reporting and display functions.

(c) Typical events subject to reporting to the head-end for processing include the following:-

* Bed Exit (with or without light switching function)
* Door Exit (‘Wandering’ into corridor)
* Overdue from Ensuite

(d) The Minder control panel shall be located at the entrance to the room and shall have the ability to arm and disarm the Bed exit and Door exit functions independently each with status LED indications. It shall also include a total overall room arm/disarm switch selector and LED indictor.

(e) Tenderers are invited to provide a list of typical accessories that would be applicable to the care of persons located within the safe containment of the Dementia wing:-

* Bed Exit floor mats (Various)
* Within Bed ‘bed exit sensor’
* Bed wet (enuresis sensor)
* Wireless versions of the above

# 13.0 POWER SUPPLIES & BATTERY BACK-UP

(a) All nurse call system power supplies shall be dedicated to that function and shall be labelled accordingly

(b) Power supplies will have surge filter protection and will generate an alarm via the system if reverting to battery back-up mode.

(c) The Power supplies shall deliver 13.8v regulated voltage with current handling capability being at least twice that required for normal operation of the connected devices.

(d) Battery back-up shall include 20AH sealed Gel battery with ability to identify a low level capacity via the system diagnostics reporting.

# 14.0 STANDARDS

The installed system shall be in accordance with the latest issue of all relevant Australian Standards and Authorities, including all amendments. In particular:-

* AS 3811 `Hard Wired patient alarm systems for hospitals (irrespective of this standard’s status)
* AS 4607 `Personal Emergency Alarm Response Systems
* AS 4083` Planning for Emergencies – Healthcare facilities (Particularly for emergency call and code call systems
* EN50082-1 Electromagnetic Compatibility - General Immunity Standard

# 15.0 WARRANTY

The warranty shall include all necessary labour and equipment to maintain the system in full operation for a period of 12 months from date of cutover.

# 16.0 SPECIAL NOTE - WHERE CALL-POINTS ARE TO BE BATTERY OPERATED

In order to preserve battery resources it is understood that certain of the specified facilities will not be readily available. Such limitations should be noted and the typical life expectance of batteries is to be provided.

**END OF ISM NURSE CALL SYSTEM SPECIFICATION**