

Part 1: Engineer's Specification

1.1 Overview

It is the intention of _____ (Facility Name) to install a single, facility-wide, Nurse/Patient Communications Network that offers virtually unrestricted flexibility in assignment of annunciation for system patient stations, peripherals, and nurse consoles. This system shall be a single network capable of up to: 250 Tek-CARE® Hubs, supporting Master Station consoles, Patient Stations and Peripheral Stations.

Conventional nurse call systems that utilize limited Personal Computer operating systems or local controller/switchers shall not be accepted.

All system components shall be listed to the UL®1069 standard by a qualified NRTL. Systems having a "core" system only listed shall not be acceptable.

1.2 Section Includes

A Nurse/Patient digital communications network is to be installed initially on floor(s) _____ and then expanded in the future to the remaining units.

1.3 References

- Underwriter's Laboratories ANSI/UL®1069 (TekTone TC3000)
- Underwriter's Laboratories ANSI/UL®2560 (TekTone TC3000)
- Canadian Standards Association C22.2, No. 205
- National Electrical Code, ANSI/NFPA 70
- Health Care Facilities, ANSI/NFPA 99
- U.S. Dept. of Labor / Occupational Safety and Health Administration
- State Hospital Code / Joint Commission of Hospitals—Nurses Call Requirements
- ISO 9001:2015 Quality Standard

1.4 Qualifications

- Authorized Distributor for product supplied. Authorized Distributor Letter from manufacturer required upon request of specifying authority.
- Applicable state licenses.

1.5 System Description

System hardware shall be manufactured by an ISO 9001:2015 certified company. Equipment manufactured by companies that are not ISO 9001:2015 shall not be acceptable.

The wired nurse call system hardware shall consist of the Tek-CARE® nurse/patient communications network, comprised of:

NC331 Tek-CARE Hub,

Master Station Consoles (two configurations):

NC404TS Touchscreen (24") Master Station, or

NC415G3 Touchscreen (5") Master Station,

PoE Network Switch:

NC554/15 15-port PoE Network Switch (UL listed)

as well as an Integration Server:

NC475 Tek-CARE® Server.

Patient stations, bath pull-cord stations, bed side-rail interfaces, code call stations, corridor dome lights, pillow speaker/entertainment cords, call cords, emergency pull-cord stations, emergency push button stations, lamp control modules, presence stations, radio page interface and wiring shall be supplied as shown on the drawings.

All necessary equipment required to meet the intent of these specifications, whether or not enumerated within these specifications, shall be supplied and installed to provide a complete and operating nurse/patient communications network.

The system shall provide for full-duplex audio between master stations in the handset mode, and remote (patient, staff and duty) audio stations. Half-duplex audio shall be selectable by individual remote audio stations for areas with abnormal acoustic requirements.

System firmware shall be the product of a reputable firmware manufacturer with a proven history of product reliability and sole control over all source code. System firmware upgrades shall not require any exchange of parts. Any supplier whose equipment requires the exchange of parts for firmware upgrades shall not be acceptable.

Equipment manufacture and testing shall be executed by an ISO 9001:2015 certified company. Manufacturing testing shall utilize applicable custom fixtures to assure the highest quality production.

The Nurse Call System provider shall provide a Fail-Safe Network topology as described below:

1. The Network shall be of a closed, proprietary nature, except where routing technology is employed to provide limited, controlled access to external ancillary systems. The Network bandwidth shall be automatically monitored, and the traffic shall be automatically controlled to ensure the specified performance.
2. The headend equipment must be able to function as a Network using a bus topology. A single failure of one NC331 Tek-CARE Hub shall not affect the functioning of other NC331s.
3. The Network shall be electrically supervised and include verification protocols for all critical data transmissions.
4. All components on the Network shall be provided with battery backup power in the event of the loss of facility-supplied AC power.
5. All system data required for the Network's operation and that of its components as relates to the primary nurse call functions shall reside in non-volatile solid-state memory. In the event of catastrophic failure due to adverse environmental conditions, the system shall use the most recent data to recover to normal operation.
6. It shall be possible to remove patient data from the system configuration before making it portable for saving or troubleshooting and merge the information back once done.

1.6 Submittals

The system described by this specification is the Tek-CARE3000 system using the NC331 Tek-CARE Hubs, manufactured by TekTone Sound and Signal Mfg., Inc. The Tek-CARE3000 system using NC331 modules meets all requirements outlined in this specification. The Tek-CARE3000 system using NC331 modules shall be considered the basis for all submitted bids.

Any supplying contractor proposing equipment which is not the base standard for this specification must provide full submittals at the time of bid. This option shall be exercised at the discretion of the owner/specifying authority.

Prior to commencement of work, the supplying contractor shall submit six (6) complete submittal sets. These sets are to be submitted in three-ring binders, continuous spiral binders, or plastic bindings that allow the booklets to lie flat while open. Each booklet shall consist of the following:

- Page 1:** Name of supplying contractor and project name.
- Page 2:** In the following order, a listing of: component quantities, equipment manufacturer, model number, and description of each component being supplied. If equipment being supplied is not the specified equipment manufacturer's model, alongside the submitted model number and description, list the specification paragraph that corresponds to the equivalent specified model. Failure to provide this information shall result in the rejection of submittals.
- Page 3:** Recently dated (within one year from submittal date) support letter from manufacturer stating that the supplying contractor is an Authorized Distributor of the product being supplied.
- Page 4:** A statement of warranty policy from manufacturer.
- Page 5:** A copy of the installing technician(s) certificate of completion from the manufacturer's training school (within three years from submittal date) for the equipment being proposed.
- Page 6:** A written statement by contractor of how and when they will complete In-Service Training, including the minimum number of hours being provided per system, procedures they will follow, what training aids are provided (technical and user manuals, data sheets, etc.) and how contractor will conduct training.
- Page 7:** A written statement from contractor of: (a) exactly how the contractor will test installed equipment and wiring, and (b) exactly how all the tests recommended by manufacturer will be performed by the contractor, prior to commissioning of system.
- Page 8:** Provide a written copy of the manufacturer's list of all of the recommended spare parts to maintain all systems specified after the warranty period. Provide the purchase price and turnaround cost (i.e., Facility's) associated with each item. List separately the cost of an annual maintenance. Show the hourly, purchased labor rates for both regular and emergency service. State any additional charges that may accompany labor charges (such as, but not limited to, travel charges, lodging, etc.).
- Pages 9+:** One catalog sheet per product of equipment listed on page 2, in the exact order as listed on page 2. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of all printed words, graphics, pictures, illustrations and other information material to the evaluation of the submittal. Submittals that are not of adequate clarity or content may be rejected and resubmission may not be allowed.

Last Page(s) or Separate: Provide all inter-equipment wiring diagrams and drawings necessary to install the equipment being supplied. These drawings will show, in detail, all wiring types by wire gauge, conductors and wire manufacturer. These drawings must be updated prior to completion of any work to reflect changes that may have been made during actual installation.

In the event the specifying authority decides to reject the submittals of a supplying contractor, the specifying authority may ask the contractor to resubmit if the discrepancies are minor. Otherwise, rejection of submittals means the specified product must be supplied.

1.7 Project Site Visit

It is the responsibility of all prospective contractors to make an adequate inspection of the project site or review of project plans. A mandatory site visit or meeting to review project plans is scheduled for the following date(s) _____. Any contractor not registered as having attended the mandatory site visit tour or the project plans review meeting will be disqualified and any bid proposal will automatically be rejected.

1.8 Demonstrations

It may be necessary to utilize demonstration equipment to test the functional operation of the contractor's submitted equipment. Contractor will be notified of any demonstration dates and times. If such demonstrations are utilized, it will be the sole judgment of the owner and/or owner's designated specifying authority to decide whether a contractor/manufacturer meets or exceeds the specification.

All demonstrated equipment must be of a standard single manufacturer and meet the same required testing and conditions that are applicable to the manufactured equipment. Custom or modified equipment that is not of standard, current manufacture cannot be demonstrated.

If necessary, owner and/or specifying authority may visit the manufacturer's facility to view functioning equipment or demonstrations and witness equipment manufacturing techniques and/or testing procedures.

1.9 Samples

The owner/specifying authority reserves the right to request one each, samples of terminal (station) equipment for the purpose of coordinating colors, aesthetics, trim-plate sizing, etc. These samples would be supplied at no cost to the owner after bid is awarded.

1.10 Scheduling

It is the responsibility of the general contractor to coordinate all work with the other trades for scheduling, rough-in, and finishing all work specified. The owner will not be liable for any additional costs due to missed dates or poor coordination of the supplying contractor with other trades.

1.11 Warranty

The warranty shall include all necessary labor and equipment to maintain the system(s) in full operation for a period of one year from the date of acceptance. Equipment only, manufactured by the manufacturer shall be warrantied for three/five years; provided the installation is performed by factory-certified technicians, and an inspection of the installation is done by a person(s) designated by the

factory. The contractor shall maintain a service department, necessary spare parts, telephone answering services, and call dispatching required to implement the service standard stated below as part of this contract. After the acceptance of the system(s), service shall be provided on the following basis:

Emergency Service—Provided **24 hours a day**. When a total or catastrophic failure of equipment is reported to contractor, within 2 hours of notification, a service person will be on site. (An example of a catastrophic failure would be a central equipment failure or a nurse master station failure.)

Routine Service—Provided **within 4 business hours** (9 a.m. to 5 p.m., Monday through Friday, excluding holidays) **of notification**. When a minor failure of equipment is reported to the contractor on a Saturday or Sunday, a service person will be on site within 4 hours of notification. (An example of a minor failure includes equipment such as patient stations, corridor lights, pull-cord stations, etc., which normally affect only one patient or patient room.)

1.12 Maintenance

The contractor shall:

- Provide necessary spare parts, noted on Page 8 of submittal (see Section 1.05), after commissioning of system(s) and before final payment.
- Provide sponsorship for at least one person designated by the owner to attend a service school held by the equipment manufacturer. Transportation to this school, meals, and lodging will be borne by the owner. The equipment manufacturer shall provide school free of charge at TekTone.
- The owner may choose to have the supplying contractor maintain the system(s). The level of service provided during the maintenance contract period would be the same as the warranty period for routine and emergency service. All labor and equipment costs shall be covered under this contract. Supplying contractor must state exact billing amounts, billing periods and all costs associated with this maintenance agreement and list any items that would not be covered under the service/maintenance agreement.

Part 2: Products

2.1 Manufacturers

The products specified shall be new and of the standard manufacture of a single, reputable, ISO 9001:2015 certified manufacturer. As a reference of standard and quality, functionality and operation, it is the request of the owner that bids be based only on equipment manufactured by TekTone Sound & Signal Mfg., Inc., Franklin, NC 28734.

2.2 Removal of Existing Product

The contractor shall remove all existing product and deliver to the owner, or at the direction of the owner, properly dispose of same.

- A. The owner will vacate a nursing unit at a time, making it available on a timetable for the installation of the new equipment.

–or–

- B. The owner will continue to occupy the nursing units where equipment will be replaced. Supplying contractor will need to coordinate work with nursing administration for each nursing unit to obtain a minimum group of four rooms at a time for replacement of equipment. The existing nurse call equipment or a temporary wireless call system must be maintained and operational during this replacement period, except for the four rooms being renovated.

2.3 Network Wiring

There shall be five (5) types of network wiring within the system.

1. The Tek-CARE Patient Station Bus shall be CAT6 (CAT5e for retrofit) or better cabling wired using the T568B standard. Station bus wiring shall be comprised of:
 - Power, 3 pair 24 AWG (2 conductors).
 - Data and Audio, 1 twisted pair 24 AWG (2 conductors).
2. Dome Light Bus shall be CAT5e or better cable and 6P6C modular connectors wired straight through. One pair in the CAT5e cable shall remain unused. Wiring length of each dome light bus shall not exceed 50'. Each dome light bus shall have a maximum of two dome lights connected.
3. Peripheral wiring shall be two 22 AWG stranded wire from the room station to the peripheral device. Each peripheral bus shall not exceed 100' of wiring.
4. The Tek-CARE Master Station Bus shall be CAT6 (CAT5e for retrofit) or better cabling wired using the T568B standard. Station bus wiring shall be comprised of:
 - Power, 3 pair 24 AWG (2 conductors).
 - Data and Audio, 1 twisted pair 24 AWG (2 conductors).
 - Plus one facility LAN connection and network cable (NC404TS)
5. Tek-CARE® Network wiring shall be CAT6 (CAT5e for retrofit) or better cable and 8P8C modular connectors wired straight through according to the T568B standard. The Tek-CARE® Network shall connect the NC331 network ports to the NC554/15 PoE Network Switch which in turn connects to the NC475 Tek-CARE® Appliance Server.

2.4 Station Hub

The contractor shall furnish, as shown on the plans, a number of NC331 hubs to furnish each nursing unit with the listed components as needed (numbers in parenthesis reflect maximums within an NC331). The NC331 provides the following connections:

- Tek-CARE Network connections (1)
- Ports: Master Station Ports (2), (no stations)
 - Each port supports up to 1 master
- or -
- Ports: Master Station Port (1) and Addressable Station / Zone Lights (9), (3 per port)
 - One port supports 1 master, using 3 ports for 3 addressable stations / zone lights each
- or -
- Ports: Addressable Station / Zone Lights (12), (3 per port)
 - Each port supports 3 addressable stations / zone lights each

Battery backup shall be provided at the PoE Switch location.

It shall be possible for each NC331 Tek-CARE Hub to support local visual call annunciation in the event of a loss of network communications.

2.5 Nurse Master Stations (Consoles)

- A. The contractor shall furnish, as shown on plans, optional nurse console(s) Model NC404TS, a Nurse Master Station with 24" touchscreen color LCD Display. It shall be a self-contained unit, desk or wall mountable. Model NC404TS shall be capable of the following functions:
- The touchscreen of the NC404TS shall be a convenient interface used to control, access, and program system features and calls displayed on the touchscreen.
 - The touchscreen displays current calls and other data.
 - Full English display with user prompts.
 - Ability to display data on the current locations of staff.
 - Connectivity for a standard USB keyboard and/or mouse shall be supported via USB ports on the rear of the NC404TS master station.
 - The NC404TS shall display up to 5 incoming calls with the ability to select a call and/or scroll to any active call using the touch screen, each call with an individual elapsed timer which increments until the call is reset. Alternatively, calls and staff location may be displayed on station icons arranged by user preference into lockable positions on the touch screen.
 - The Master Station shall be able to receive and display any or all calls placed in the system, including simultaneous call types from the same room. Calls shall be sorted and displayed first by call priority and then by the chronological time in which the calls were placed.
 - There shall be at least 256 possible unique user-definable call types.
 - Choice of Push-to-Talk or private conversation using the handset.
 - Automatic answer of highest priority call or selective answer of any displayed call.

- Set/Review up to four levels of service required—STAT Assist, Staff L1 (Green), Staff L2 (Amber) & Staff L3 (Yellow).
 - Three user accessible tone levels for Day and Nighttime levels.
 - Optional tone silence by user definable call types. Silenced tones are regenerated whenever a new incoming call is received.
 1. Tone silence defaulted to “Routine” calls.
 2. Software shall be able to optionally defeat Tone Silence feature.
 - Ability to swing an individual room using convenient per-station zoning.
 - Ability to zone capture an individual nursing unit, selected units, or all units in facility by using custom-defined zones, per-master zoning and per-station zoning.
 - Direct messaging (canned/custom) to pocket pager(s).
 - Locate up to three levels of staff with remote cancel of manual staff registration: Staff L1 (Green), Staff L2 (Amber) and Staff L3 (Yellow).
 - Continuously supervised with self-diagnosing error messages.
 - ESD protected to 8kV per UL®1069.
 - Consoles may be located anywhere within facility nurse/patient communications network.
 - Pleasant sounding call tones.
- B.** The contractor shall furnish, as shown on the plans, standard nurse console(s) NC415G3 compact Master Station with an integral 5-inch touchscreen display and interface. It shall be a self-contained unit, with wall or desk mount options. When desk mounted, it shall not occupy more than 55 square inches of desk space with the following specifications:
- This model Master Station shall be powered from the NC331 Tek-CARE Hub and does not require access to local AC power. Battery backup for switchover is provided at the PoE switch.
 - Utilizes a 5" color touchscreen display.
 - Display up to 3 incoming calls (with the ability to scroll to any active call), each with an individual elapsed timer that increments until the call is reset.
 - The Master Station shall be able to receive and display any or all calls placed in the system, including simultaneous call types from the same room. Calls shall be sorted and displayed first by call priority and then by the chronological time in which the calls were placed.
 - There shall be at least 256 possible unique user-definable call types.
 - Choice of Push-to-Talk or private conversation using the handset.
 - Automatic answer of highest priority call or selective answer of any displayed call.
 - Set/Review up to four levels of service required—STAT Assist, Staff L1 (Green), Staff L2 (Amber) & Staff L3 (Yellow).
 - Audio—master page, zone page and system page with staff level filtering options.
 - Optional tone silence by user definable call types. Silenced tones are regenerated whenever a new incoming call is received.

1. Tone silence defaulted to “Routine” calls.
 2. Software shall be able to optionally defeat Tone Silence feature.
- Ability to block loudspeaker paging per patient station to facilitate a low-noise patient environment. Password protection can be enabled to allow only authorized access to audio paging.
 - Ability to zone capture an individual nursing unit, selected units, or all units in facility by using custom-defined zones, per-master zoning and per-station zoning.
 - Direct messaging (canned/custom) to pocket pager(s).
 - A Staff Phone App to run on any mobile iOS or Android (4.0 or later) device connected to a facility's Wi-Fi network.
 - Locate up to three levels of staff with remote cancel of manual staff registration: Staff L1 (Green), Staff L2 (Amber) and Staff L3 (Yellow).
 - Continuously supervised with self-diagnosing error messages.
 - ESD protected to 8kV per UL®1069.
 - Consoles may be located anywhere within facility nurse/patient communications network.
 - Pleasant sounding programmable call tones.

Master Station firmware operates on TekTone's operating system. Master Stations which utilize an outside supplier's operating system where software failure (“lock-up”) may occur due to inconsistencies and incompatibilities between operating system and equipment supplier's software, rather than operating in a firmware environment, shall not be accepted. All required software/firmware shall be supplied by TekTone.

Programming of Master Stations shall be done locally, or from a ConfigTool Live configurator, or from a Tek-CARE connected PC-based configuration tool.

It shall be possible to remove and/or replace any console(s) while the system is operational without the loss of any calls, damage to any system components, or reprogramming of console attributes.

2.6 Bedside Patient Stations

The contractor shall provide single bed Model IR331 or dual bed Model IR332 as shown on plans. Each IR331 single or IR332 dual bedside patient station shall be capable of the following:

- At least 256 completely custom configurable call types. Configurability shall extend to call labels/priorities/levels/tone-dome light annunciations.
- Full-duplex audio with the master station from the handset.
- Programmable 24-character patient name or label, plus an 8-character architectural room name that display at master station with other relevant call information.
- Up to three levels of staff service and a rounding function.
- Include IR331 single DIN jack patient stations as required.
 - Single station shall include at minimum:
 - One DIN jack
 - Three buttons; 2 CALL and 1 RESET

- Include IR332 dual DIN jack patient stations as required.
 - Dual station shall include at minimum:
 - Two DIN jacks
 - One button; RESET
- Dummy plugs shall not be required to prevent calls from empty patient front panel station connectors. Systems that require dummy plugs to prevent calls are not acceptable. Patient stations must provide “cord-out” detection when call cords are used.
- Full peripheral switch supervision i.e., emergency and code blue switches.
- All peripheral device wiring shall terminate at the patient station. Systems requiring additional modules shall not be acceptable.
- Meet or exceed UL®1069 Electrostatic Discharge (ESD) requirements with test verification performed by Underwriters Laboratories, Inc.
- Plug-in pigtailed peripheral connections.
- Provide interface to local equipment alarm contacts (i.e., ventilator, IV drip, fire detector, etc.) to notify master console of local alarm condition in patient room. Call identifications shall be programmable.
- Support Dome Lamp Model LI484P5, designed to connect directly to patient station via current-limited station outputs.
- Common call-reset button for all Routine, Priority and Upgraded calls placed from station and one call-placed LED per bed.
- Continuous supervision for station power and data lines as well as data communications.
- Ability to program on a per station basis, each bed and entertainment/call cord receptacle and/or bused peripheral input to a custom call type.
- Ability to service exchange station “hot” (i.e., without removing system power or powering down local Central Equipment).
- Patient station addressing shall be accomplished using simple dip switches. Methods that do not provide for simple DIP switch addressing shall not be acceptable.
- If specialty bed interface is required, provide one JK431G3 mounted on a 1-gang ring and 2-gang box for each bed.
- Station mounting shall be available for 2- or 3-gang ring with box or masonry box depending on space and code requirements.

2.7 Patient Entertainment Speaker/Call Cords

The contractor shall:

- A. Provide, one per bed, an entertainment pillow speaker Model SF431PSG3 that includes the following functions:
 - Nurse call button designated by universal nurse symbol, speaker and microphone, seven (7) Auxiliary patient request buttons; 2 Environmental, Pain, Toilet, Water, room light, and read light controls, 8' cord with heavy duty DIN plug, TV channel up/down, volume control up/down, TV power, mute, closed caption, sleep, and shall be oxygen safe.
- B. Provide, one per bed, a DIN-plug strain relief cable model SF401EX.

- C. Provide, one per 10 beds or as required, a Model SF401A single-pendant-type oxygen-safe/waterproof call cord complete with 7' cord, DIN plug and sheet clip.
- D. Provide, one per 10 beds or as required, a Model SF401G single oxygen/geriatric pressure-ball cord set utilizing a pneumatically controlled switch for use in oxygen-enriched environment, complete with 6' cord, DIN plug and sheet clip.
- E. Systems requiring special adapters to convert to DIN plugs, or that use non-standard (non-DIN) cord sets, shall not be acceptable.

2.8 Multipurpose Station

The contractor shall provide as required, a universal interface Model IR334 Multipurpose Station for standalone peripheral stations.

Where shown on plans, this module may be used to drive corridor paging amplifier(s) via a grounded, shielded transformer (to prevent leakage current from being impressed on the isolated circuits of the nurse call system). Alternately, the IR334 may be connected directly to a 25-volt, ½-watt speaker for paging. Always use grounded, shielded transformers to prevent current leakage to the nurse call system's isolated circuits. This unit shall also be capable of providing auxiliary alarm device contacts inputs for nurse console notification of a local alarm(s) using the PM123 Aux Input module. It shall also provide the same peripheral inputs as patient stations.

2.9 Staff / Duty / Resident Station

The contractor shall provide as required, a Staff / Duty / Resident Station Model IR330.

Each IR330 Staff / Duty / Resident Station shall have a call button, emergency button, reset button and speaker for audio communication. Pressing the call or emergency button shall place a call to the assigned Master Station; optional programming shall allow the default staff-call type to be changed to any valid patient station call type.

2.9.1 As a Duty Station

In addition to the call and audio capabilities, the unit shall provide remote annunciation of assigned bedside patient stations and peripherals via two RGB indicators around the Reset button and call tones; it shall drive an LI484P5 corridor light (in a zone lamp mode). The tones generated by the duty station shall be the same as the call tones generated by the master station. Duty stations that do not generate the same tones at the system's master station shall not be acceptable.

Alternatively for a duty station;

The contractor shall furnish, as shown on plans, an audible/visual enhanced duty station Model NC415G3. The NC415G3 is a compact station with a 5" color touchscreen LCD Display. It shall be wall mounted or used on a desk with optional desk stand. Model NC415G3 shall be capable of the following functions:

The touchscreen of the NC415G3 shall provide audible and visual display of incoming calls as well as some level of call management including at least call screen, call status, keypad, zoning and annunciation settings

The NC415G3 shall be optionally wall mounted in a 2-gang box with an IH415W bracket or desk mounted with an IH415LD bracket.

2.10 Peripheral Stations

The contractor shall provide, as shown on plans, peripheral devices associated with multipurpose stations, bedside, staff, or duty stations that are wired via plug-in connectors. Individual peripheral devices shall be:

- A. Waterproof Emergency pull-cord switch Model SF123 built in a single-gang ABS plastic Bezel with matching mounting plate. The SF123 utilizes a waterproof membrane faceplate with two button actuators and an optional 6-foot pull cord for call placement. Inserting optional button labeling allows the SF123 to be a code, emergency, bath or check-in switch.
- B. Staff presence switch Model SF124 shall have four push buttons one each for three staff levels (i.e., Nurse, Aide and CNA) and one for a Staff Emergency call. When a staff member pushes the button, the associated LED and corridor lamp shall light. An existing patient call or service requirement shall be automatically canceled at time of registration and the staff may be located from any assigned nurse console.
- C. Auxiliary input module Model PM123 shall provide two inputs capable of monitoring normally open dry contacts allowing the Tek-CARE3000 Nurse Call Systems to monitor devices such as device alarm contacts, door contacts, security panel outputs, and more. There shall be two programmable behaviors; Follower and Acknowledge, which are programmable using the LS450 Config Tool.
- D. Remote speaker station IR160 can be used where audio might be needed away from the station.

2.11 Corridor Light

The contractor shall:

Provide corridor lights model LI484P5 as shown on plans. The corridor light shall be sectional in design, with a flame-retardant translucent plastic lens mounted on a flame retardant (UL®94 HB) plastic base panel. Dome light indications shall be provided by four multicolored LEDs that indicate patient call priority and staff presence. The dome light shall be programmable to produce any of eight colors: white, pink, red, orange, yellow, green, blue and purple. Each section of the LI484P5 shall be programmable with a primary and secondary color per any of 256 user definable call types. Wiring connections shall be plug-in.

It shall be possible to connect a secondary LI484P5 Corridor Light to the Primary LI484P5. The Secondary LI484P5 mimics the call indications of the primary LI484P5 so that calls from a single room can be displayed in two locations. Systems that do not support secondary corridor lights are not acceptable.

The LI484P5 may be used as a zone light by adding a PM424ZP5 Zone Light Module or an IR330 Duty Station. The PM424ZP5 shall support four SF120 Peripheral inputs input to be used when a standalone switch is required.

2.12 Tek-CARE® Appliance Server

The contractor shall:

The contractor shall furnish an **NC475 Tek-CARE® Appliance Server** with Tek-CARE software as required.

- A. Proprietary nurse call appliance server running the Tek-CARE OS. The Tek-CARE® Appliance Server is available in two variants.
 - 1. The NC475 is a headless appliance server.

2. The NC475DESK is supplied with a touchscreen monitor, and wireless keyboard and mouse.
- B. The NC475DESK can function as the primary master station for a Tek-CARE system.
- C. The Tek-CARE® Appliance Server shall sound an audible alarm when a call is placed, and staff shall be notified via the LCD display or touchscreen monitor if installed of the call type and room number.
- D. Includes paging software module for automatic and manual pages to staff.
- E. Software module choices include event monitoring, reporting, Staff App, Apple TV displays, email output, Tek-CARE® Event Monitor App for Windows, and more.
- F. The Tek-CARE System with NC475 shall be able to support up to 254 Tek-CARE® Event Monitor App for Windows, 255 Apple TVs and 255 Mobile Apps.
- G. Tek-CARE® Appliance Server shall interface with the optional Tek-PAGING® Radio Pocket Paging System.
- H. Backup power for the Tek-CARE® Appliance Server shall be supplied by an uninterruptable power supply (UPS). The UPS shall be TekTone PK250B.
- I. The Tek-CARE® Appliance Server shall be capable of being configured to provide the features shown in the following sections.

2.13 Tek-CARE® Event Monitor App for Windows Software

The Nurse Call System shall support an optional remote Tek-CARE® Event Monitor App for Windows that may be installed on any networked facility personal computer running Windows 7 or higher. The Tek-CARE® Event Monitor App for Windows requires that the Tek-CARE® Appliance Server be connected via LAN and properly licensed.

The Tek-CARE® Event Monitor App for Windows is used to remotely display and manage calls received by the Nurse Call System. The Tek-CARE® Event Monitor App for Windows shall display all calls from connected Nurse Call Systems as well as Nurse Call System faults. The Tek-CARE® Event Monitor App for Windows software shall be TekTone LS623-series.

The Tek-CARE® Appliance Server shall be configured using LS450 configuration software for setup and programming. The configuration software shall enable programming of all licensed system features.

2.14 Configuration Software; ConfigTool LS450

The Tek-CARE® Appliance Server shall be configured using LS450 configuration software for setup and programming. The configuration software shall enable programming of all licensed system features.

2.15 Configuration Software; ConfigTool Live LS454

The LS454 software shall also enable users to view information about the system, including patients, staff, staff groups, staff assignments, and scheduled messaging and make limited changes to the system configuration while the system is up a running (Live).

2.16 Reporting System

A reporting system that is operationally transparent to the Nurse Call System shall be provided with the system. The reporting database shall automatically log system events and store them for retrieval at a later date.

Any event that is annunciated by the system shall be automatically logged in the reporting database. The database shall record all system activity for review at a later time using the optional Reporting software. The database shall record all information about the event, including response time and the time and date of the event. No action by the user shall be necessary to record system events. The database shall not require any maintenance or periodic cleanup by the user.

The reporting system can be accessed by any of the following: a PC on the network accessing the NC475 Tek-CARE® Server, and a Tek-CARE® Event Monitor App for Windows running on networked PCs.

Report creation shall be simple and completely customizable. Reports shall be viewable in a web browser as an HTML file or exported as a CSV file. The reporting system shall have quick links for creating commonly requested report ranges (last day, last week, etc.) as well as offering fully customizable report creation.

Using the optional LS453 Email Output software, the reporting system shall be capable of generating reports and distributing them automatically via email.

The reporting system shall be available as an optional feature and shall be TekTone LS610 series.

2.17 Pocket Paging

The contractor shall:

Provide a pocket paging transmitter and alphanumeric pagers, or LED Messaging Sign. The transmitter shall be capable of being connected to the Nurse Call System via the Tek-CARE® Appliance Server, and shall be operationally transparent to the Nurse Call System. The pocket paging interface shall allow COMP2, TAP and Scope protocols. The pocket paging equipment shall support the following features:

- The Nurse Call System shall accommodate up to 256 unique pager cap codes. Each pager cap code may be given a name describing it and/or the staff member who carries it. Each pager may belong to multiple pager groups, of which the system shall allow up to 255.
- The system shall allow four types of paging assignment:
 1. From a station to a pager
 2. From a station to a pager group
 3. From a zone to a pager
 4. From a zone to a pager group
- Each assignment shall have the following properties:
 1. Level—whether the assignment is primary, secondary, or tertiary
 2. Call filter—the call types to which the assignment applies
 3. Page resets—whether the assignment applies to resets
 4. Page faults—whether the assignment applies to faults
- Paging assignments shall be fully configurable from the nurse call master station, remote event monitors and from the Tek-CARE® Appliance Server running the ConfigTool programming software.

The system shall allow two types of paging: manual and automatic. Automatic paging may be turned off or on; when on, it shall operate concurrently with manual paging.

Manual paging shall be executed either from the integration server, event monitor apps or a nurse call master station. At any time, the attendant may page by pager, pager group, station or zone. For convenience, system paging shall also be directly supported. Paging by station or zone shall occur through that station's or zone's paging assignments. For a station page, the attendant may select the levels of assignment (primary, secondary and/or tertiary) to be used in the page. For a call-related page, the default page message shall include information about the call, including the call type and room number requiring assistance. The attendant may edit the message or make use of a pre-programmed list of patient needs.

Automatic paging shall be governed by paging assignments. When a call is placed from a patient station, the system shall automatically page pagers or pager groups assigned to that station or its zones. The properties of each assignment shall determine its applicability to the page, ensuring that pages reach exactly the staff members they concern. For example, a call of a particular type shall activate only those assignments whose call filters allow that type. For each call, automatic paging shall begin at the primary level and repeat at regular intervals. If the call is not reset, the page shall escalate to include up to 8 levels. The pager shall display the location where the call originated (room ID), as well as the call type. Call resets and faults may also be paged automatically.

Systems that require additional software or licensing to enable paging shall not be acceptable.

The transmitter shall be TekTone NC365B.

The alphanumeric pager shall be TekTone NC397A.

2.18 Email Output

The contractor shall provide:

An interface to the facility's mail server that routes calls via an unauthenticated SMTP route from the nurse call system to email addresses as required.

The email output software shall enable real-time event notifications to be sent to email addresses and any device with an email gateway.

The email output software shall allow users to create scheduled reports that are emailed directly to the specified users.

The email output software shall be available as an optional feature and shall be TekTone LS453.

2.19 Tek-CARE® Staff App Integration

The contractor shall provide, as required, an interface to up to 255 mobile Android, Apple iPod Touch® and iPhone® devices and/or up to 255 Apple TV® devices. The required non-voice Staff App server shall be TekTone LS620 and the non-voice app licenses shall be TekTone LS621-series. The required voice Staff App server shall be TekTone LS630 and the voice app licenses shall be TekTone LS631-series. The Apple TV® interface shall be TekTone LS622-series.

The Staff App integration shall display calls placed on the Nurse Call System to improve staff efficiency and awareness. With the voice-enabled app, it shall be possible to answer calls and speak directly to residents and patient speaker type stations installed. The Staff App integrations shall only function when connected to the facility's wireless LAN. Staff App integrations that allow access to system calls when the mobile device is not on facility premises shall not be accepted.

Apple TV® devices and Mobile client assignments shall be configurable in the same way as the radio pagers can be. Messaging shall be automatic and support manual messaging.

The Staff App operates as a staff device on the Tek-CARE® system, allowing each individual app to be configured for a particular staff member's need.

2.20 Foreign Systems Integration

The contractor shall:

Provide, as required, the LS600 Tek-ALERT® software and appropriate connection hardware to enable the Nurse Call System to monitor and display calls and status of connected foreign systems such as security systems, fire alarm systems, and more.

The monitored foreign system must supply an accessible data stream via one of the following protocols: Serial (event printing, Scope paging, ContactID), COMP2, TAP, HL7, TCP/IP, TCP/IP Listener or UDP. Contact TekTone if a protocol is not listed, as protocol libraries will grow.

Foreign Systems Integration shall support the following features:

- Once properly configured, the Tek-ALERT Integration Manager shall receive events from monitored foreign systems and annunciate the events on the Nurse Call System.
- Events from monitored foreign systems shall appear in the reports created by the Tek-CARE Reporting System. These events may also be sent to pagers/apps as configured in assignment settings.
- The Tek-ALERT Integration Manager shall not be used as the primary annunciation point for monitored foreign systems, but shall function as a secondary annunciation point. Tek-ALERT programming and use shall not interfere with the primary annunciation settings of the monitored foreign system(s).

2.21 Media Gateway Server License

The contractor shall provide, as required:

A Media Gateway license, model LS460, to provide call and event notifications via the Tek-CARE® Appliance Server to facility VoIP extensions and deliver pertinent information on the telephone display. It shall provide protocol conversion between TekTone's audio manager and a facility PBX that uses SIP G.711 as the primary protocol.

The LS460 also shall support two-way voice communication between patient room stations and facility VoIP extensions.

The Media Gateway shall be capable of connecting to both the PBX network and Tek-CARE Network and shall be operationally transparent to the nurse call system.

The interface shall support the following features:

- Provides up to 36 audio paths
- Display of patient or resident nurse call alarms
- Accept incoming voice calls from the nurse call system
- Reset a nurse call alarm (low priority only and can be enabled or disabled)
- In-call options (connected call)
 - Place a Level 1, 2 or 3 service request
 - Place a STAT call
- Place a call to a room station, zone or master
- Receive manual text messages from a master or remote monitor
- Software updates along with any other nurse call system module update

Telephone extension assignments shall be configurable in the same way as the radio pagers can be and support manual messaging.

2.22 ADT Interface Using the HL7 Standard Software

The contractor shall:

- Provide an HL7 (v. 2.3) compliant interface for the purpose of receiving relevant patient information from the facility's Admit, Discharge, Transfer system. Relevant patient information shall include patient name, room number, bed number and doctor name.

The interface shall:

- Insert standard ADT field information into nurse call system fields.
- Update in real time.

The ADT Interface software shall be available as an optional feature and shall be TekTone LS452.

2.23 System Diagnostics

All Network modules and Apps, Nurse Master Stations and IR330-series stations in the system shall be continuously supervised for power and data. Each IR330-series station shall in turn monitor its peripheral bus devices and dome lamps as previously specified. All system faults shall be annunciated on a Nurse Master Station with pertinent information as to the type and location of fault.

Part 3: Execution

3.1 Supervision

- B. The manufacturer shall have the equipment manufacturer's engineer or their designated agent inspect the installation and operation of this network to determine that the network complies with all standards listed in Section 2.3.

3.2 In-Service Training

The contractor shall provide thorough training of all nursing staff assigned to those nursing units receiving newly networked nurse/patient communications equipment. This training shall be developed and implemented to address two different types of staff: floor nurses/staff shall receive training that is specific to their tasks and responsibilities, and similarly, unit secretaries (or any person whose specific responsibilities include answering patient calls and dispatching staff) shall receive operational training from their perspective. A separate training room shall be set up that allows this type of individualized training utilizing in-service training unit, prior to the turning over of the new system.

3.3 Wiring

- A. The contractor shall terminate all wiring with manufacturer's approved connectors. The use of wire nuts is prohibited.
- B. All wiring shall be free from shorts and faults. Wiring shall be UL® Listed, and installed in accordance with ANSI/NFPA 70, Article 25 and applicable sections of ANSI/NFPA 99, and compliant with the manufacturer's installation and maintenance manual and specifications.
- C. Nurse patient communications network wiring shall not be run in the same conduit with other systems (e.g.: Class 1 AC power distribution, fire alarm, entertainment systems, lighting controls, etc.).

3.4 Electrical Power Connections

- A. It shall be the responsibility of the facility to provide a dedicated 120 VAC, 60 Hz conduit feed into the equipment cabinet. This power feed shall not have any other devices connected to it. A 20-amp circuit breaker shall be located in the electrical sub-panel. This circuit breaker shall be labeled "Nurse Call" along with identification of the Nursing Unit that shall be controlled by this circuit breaker. This electrical circuit shall be connected to the facility's emergency power system for automatic power switchover during loss of utility power.
- B. Connect all network system power supplies and equipment cabinets to a common earth ground approved for the application utilizing a 14 AWG or larger solid conductor which is at minimum the same conductor size as the AC feed wires.

3.5 Environmental Protection

The installing contractor shall make certain that all central equipment is accessible for service. Contractor shall notify specifying authority if designated equipment closet does not meet manufacturer's requirements for heat, radiation or static electricity.

3.6 Protection of Network Devices

The contractor shall protect network devices during unpacking and installation by wearing manufacturer-approved ESD wrist straps tied to earth ground. The wrist strap shall meet OSHA requirements for prevention of electrical shock if technician comes in contact with high voltage.

3.7 Cleaning and Patching

- A. It shall be the responsibility of the contractor to keep the work area clear of debris and to clean area daily at completion of work.
- B. It shall be the responsibility of the contractor to patch and paint any wall or surface that has been disturbed by the execution of this work.

3.8 Drawings

Provide as-built drawings of all installed network components and associated wiring on building plans. Final payment for work will not be authorized unless these drawings are supplied.

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END OF SECTION