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Tek-CARE300III

UL1069 Listed Nurse Call System

Installation and Operation Manual

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Tek-CARE300III Wireless Nurse Call Installation Manual

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A Word about ESD (Electrostatic Discharge)

What Is It? Static electricity is a result of triboelectric charging of two dissimilar nonconductive materials that are rubbed together, such as rubbing your feet on a carpet on a cold winter day or in a dry climate. The resulting charge is detected when you reach out to touch a doorknob or some other metallic object. The resulting discharge may only be startling or, in severe cases, it may even be painful. The actual electrical charge is dependent on the materials being rubbed together, humidity, the rate of separation, and other factors.

What Can It Do? While this effect may be disturbing to humans, the effect on electronic equipment is often more serious, ranging from operational disruption to actual component damage. These effects result from the high voltages that may be developed. The simple act of walking across a carpet may develop as much as 30,000 volts, and changing a bed sheet may create a charge of 100,000 volts or more. Such voltages readily cause arcing (the spark that can be observed when you grab a doorknob after walking across a carpet, etc.). The arcing is evidence of the discharge path. Due to the high voltage involved, the discharge current can jump to any nearby metallic or nonmetallic object. If the discharge is to or through an electronic device, such as the nurse call system, the operation of the device may be affected. If the discharge current passes through internal components, these components may be damaged or their operation degraded.

What Can We Do About It? The manufacturer of the nurse call equipment has already taken steps to protect the equipment from electrostatic discharge (ESD) effects. Our peripheral equipment has been tested and listed by UL® to withstand discharges of up to 30K volts. However, since the cause is not in the equipment, but in the environment, further measures are required of the installer and the user to achieve complete protection.

What the Installer Can Do: In humid climates or in places where the relative humidity is kept at 65% or greater, there will likely be few problems with ESD. Where problems may occur the following measures can be taken.

- Ground all exposed metal surfaces. Grounding should be to a #16 gauge or larger conductor.
- Install nurse call system wiring in metal conduit. This conduit may be used to ground panels.
- Use shielded cable (where specified) for nurse call system station-to-station wiring. The use of open conductors invites inductive coupling of discharge currents, which can cause the same problems as direct discharge currents.
- Ground your body before handling system components. This can be done by using a wrist strap, or simply by contacting a grounded metal surface. Use caution to avoid hazardous voltages while grounded.

What the User Can Do: The most common generation of ESD in hospitals is due to changing linen on hospital beds while the patient call cord or pillow speaker is still connected to the nurse call system. The following precautions will help.

Remove the call cord or pillow speaker from the bed before changing the linen. It will be necessary for the nursing staff to discharge themselves by contacting a grounded metal object before placing the call cord or pillow speaker back on the bed; otherwise, a spark will jump to the nurse call equipment, causing the very damage they are trying to avoid. To avoid a shock while discharging static electricity on the body, hold a metal object, such as a key, and use that object to contact the grounded surface.

This information is provided to make you aware of ESD problems so that precautions may be taken to avoid damage and disruption of system operation.

System Introduction

Welcome to the installation manual for the Tek-CARE300III Nurse Call System. This manual will walk you through the installation and configuration process and will cover system operation. If you have any questions at any point during the installation process, contact our Technical Support Department by email at teksupt@tektone.com or by phone at 800.327.8466 or 828.524.9967. Choose Option 3 for Technical Support.

The Tek-CARE300III Nurse Call System is a supervised microprocessor-based nurse call system that provides a complete range of two-way audio and visual signaling combined with programmable system configuration and information tools. These functions permit easy communication between facility staff and patients, as well as between staff members.

The NC356CE Module is a third-generation module designed to be networked on the Tek-CARE platform and be programmed using the LS450 ConfigTool software. When combined with an NC475 Appliance Server, this module provides advanced features like event logging and reporting, mobile apps, email, and much more.

The system is completed by a variety of patient stations and peripheral devices to meet all staff and patient needs. The equipment uses plug-in modular components, allowing them to be expanded and interchanged as needed in existing and new facilities.

System Installation

Read the following information prior to installing the Tek-CARE300III system equipment. The installer must be familiar with the system and its installation requirements and guidelines.

1. Determine equipment locations.
2. Install housings.
3. Install system wiring.
4. Use ohmmeter to check for shorts and grounds in system wiring.

   NOTE: This is a critical and necessary step for avoiding installation problems later. When checking for shorts between shields, remember that the provided inter-connection cable harnesses already have the shields connected together internally as a preparation to their introduction to the central equipment's ground.

5. Connect equipment to system wiring. See Troubleshooting Tip below.
6. Power up the equipment.
7. Set patient, staff and duty station addresses. Refer to **Figure 9 on page 18**.
8. Program the Tek-CARE system with the LS450 ConfigTool.
9. Verify connections.
10. Perform full operational test of the system, including all peripheral devices.
11. Train system operators.

TROUBLESHOOTING TIP: Before the above process begins, consider this brief comment on troubleshooting. The transition between Steps 9 and 10 is a very important one. It is during this phase of the installation process that the system is first powered up with field wiring, patient stations and peripheral devices. This is the time when most installers encounter problems with wiring and equipment.

Problems to Avoid

NOTE: Each port supports up to 32 addressable stations and each cable run on that port supports a maximum of 16 addressable stations. The total length of these runs per port shall not exceed 1000'.

- Do not use wire nuts for wire connections. Wire connections must be made with compression-type connectors, rated for stranded wire, that use a ratcheting-type tool for installation.
- Do not short shields together, as this allows for noise transference from the data lines to the audio lines.
- Unused conductors from the plug-on wiring harnesses of various devices must be taped up to prevent the ends of the cut wires from coming into contact with other points (circuit boards, back boxes, etc.).
- Do not exceed the maximum specified cable distances. Pay extra attention during the planning stages when running cable to areas that add "hidden" length to cable runs.
- The capacitance on the data wires is critical (<24 pF/ft.). If the cable capacitance exceeds this level, data signal degradation can occur and interfere with normal system operation.
- Do not run system cabling in close proximity to other electrical system cables or building power cables. These systems can induce noise, resulting in system operational problems and/or audio noise.

Equipment Descriptions, Requirements and Locations

Locate the Tek-CARE300III System Equipment in accordance with the following information. The installation of all system equipment, cabling and enclosures must be in accordance with the National Electrical Code (ANSI/NFPA 70-1999), the Healthcare Facilities Code (ANSI/NFPA 99-1999), and all applicable state and local codes.

NC356CE Module: The NC356CE is the core piece of equipment for the Tek-CARE300III Nurse Call System. All master stations and patient stations connect to it. The NC356CE has two ports (0 and 1) and will support six master stations (three per port), 64 patient stations (addresses 0-31 per port). Up to 20 modules can be networked together on the Tek-CARE system. The NC356CE must be located near a dedicated 115VAC outlet connected to the Emergency Branch of the facility's Essential Electrical System (i.e., connected to a backup power source), suitable for computer-grade equipment. The device must be shelf, desk, or rack mounted in an area with a consistent temperature and relative humidity not exceeding 95%.

> **NOTE**: All NC356CEs require the external PK356 supplemental power supply, which is included.

PK356 Supplemental Power Supply: The PK356 provides DC power to the system. The PK356 power supply must always be powered down when the central equipment is powered down. Therefore suggested that the PK356 and the NC356CE be plugged into a power strip which is connected to 120AC. Do not locate these devices near other electrical systems, such as fire alarm panels, electrical motors, air conditioning equipment, etc. The PK356 must be located near a dedicated 115VAC outlet connected to the Emergency Power Circuit (i.e., connected to a backup power source), suitable for computer-grade equipment, and within 2' of the NC356CE. Interconnect the NC356CE and the PK356 using the provided interconnection cable.

NC475 Tek-CARE Appliance Server: The NC475 Tek-CARE Appliance Server is the proprietary nurse call appliance server which adds various features and functionality to the Tek-CARE300III Nurse Call System. It can be available as either a headless appliance server or can be supplied with a 24" touchscreen monitor and wireless mouse (NC475DESK). It has two network interface ports and six RS232 serial ports. The NC475 Tek-CARE Appliance Server may be powered by 110-220 VAC line power. An uninterruptible power supply must be used. The power supply and NC475 must be connected to a generator-backed AC circuit suitable for life safety equipment. For more information, see IL1012 NC475 Tek-CARE Appliance Server Manual.

NC415G3/NC404TS Master Stations: The NC415G3 and NC404TS are used by the facility staff to interact and communicate with patients through the nurse call system. The staff may answer calls via loudspeaker or by using the handset for calls that require more privacy. The master station is typically located on a desk or counter top or can be wall mounted, within easy reach of the facility staff. The operating environment for the master station is approximately 26°C and relative humidity not exceeding 80%. For more information on the NC404TS, see IL1052 NC404TS Installation and Operation Manual.

> **NOTE**: The NC475 Appliance Server is ***required*** when using the NC404TS on a 300III system.

IR3xx-series Stations—General Information: All of the IR3xx-series devices' electronics are mounted on a flame-retardant ABS plastic panel. Users must observe ESD precautions [see **A Word about ESD (Electrostatic Discharge) on page 4**] when handling these devices as they may be damaged if improperly handled. Each of the IR3xx-series stations require a unique address, which is set using the on-board dip switch. Plug-on connectors are provided for easy installation. The IR300-series must be located central to the various peripheral devices that are connected to it.

The IR3xx-series stations use the Steel City H3BD back box with a 3GC plaster ring. Refer to Figure 1 below for mounting. The minimum dimensions for the back box must be not less than 8.6" × 4.5" × 2.5", and the minimum clearance from current carrying parts to dead metal parts must be no less than 0.5". If a station has a pillow speaker module, a bigger back box is recommended. These devices are typically located for convenience, most commonly at the head of the patient's bed, unless specified otherwise. The IR3xx-series stations must be located within 1000′ feet of the NC356CE, and so that furniture, curtains and other features do not interfere with audio communication. See the wiring diagrams at the end of this manual for additional requirements. NOTE: There are additional guidelines for station location in the wiring installation section. The operating environment for the IR3xx-series stations is 10–40°C with relative humidity not exceeding 80%. See the **Wiring Installation on page 12** for additional information.

Figure 1 - Mounting IR-series Stations

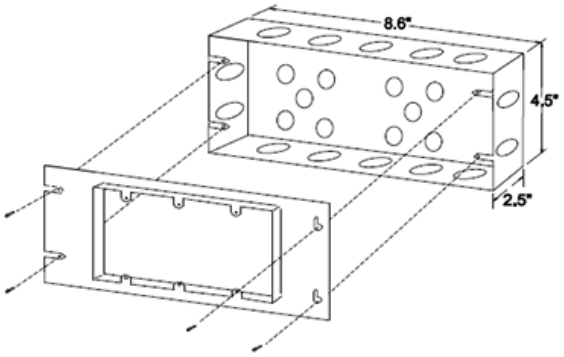


Figure 2 - Mounting LI380, LI386 Dome/Zone Lights

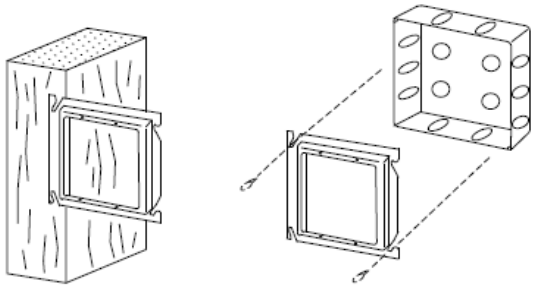
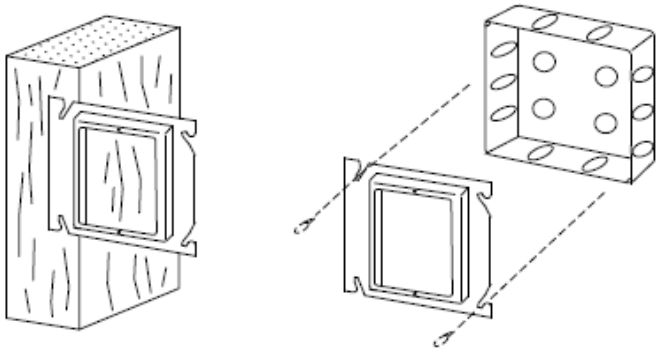


Figure 3 - Mounting SF-series Stations



IR300 Multipurpose Station: The IR300 Multipurpose Station serves as an address point for stand-alone peripheral device applications. It has no external controls, but does have additional control connections brought out to an additional header (refer to **Figure 22 on page 30**). Activate a special feature on the IR300 station (only) by turning on dip switch 7 to allow the device to operate its dome lamp outputs as zone lamps for zone annunciation.

SF380 Single Patient Stations: The SF380 stations generate routine, cord-out and bath call placement signals. These stations are mounted on single-gang boxes. The stations support both code and bath signals.

IR311 Single and IR312 Dual Patient Replacement Stations: The IR311 and IR312 stations are available as replacements. The jacks are 8P8C type—one for the IR311 and two for the IR312. Additional headers are provided for specific pillow speaker-only connections—one for the IR311 and two for the IR312 (refer to **Figure 22 on page 30**). These stations can interface with the PM311C/PM312C Intercom Modules and the PM321B/PM322B Lamp Control Modules. See **IR3xx-series Station—General Information on page 9** for additional details.

IR319-series Single, IR320-series Dual Patient Stations: The IR319-series and IR320-series are identical to the IR301-series and IR302-series, with the exception of the jack type and added pillow speaker function control lines. The jacks are DIN type—one for the IR319-series and two for the IR320-series. Additional headers are provided for specific pillow speaker-only connections—one for the IR319-series and two for the IR320-series (refer to **Figure 22 on page 30**). These stations can interface with the PM311C/PM312C Intercom Modules and the PM321B/PM322B Lamp Control Modules. See **IR3xx-series Station—General Information on page 9** for additional details.

PM311C/PM312C Pillow Speaker Intercom Modules: The PM311C (for IR311-series or IR319-series) and PM312C (for IR312-series or IR320-series) modules connect to the patient station and allow the nurse call system audio to be redirected from the patient station to the pillow speaker connected to it. SF301PI series, SF301DIG, SF401DIG or SF41-series pillow speakers are required for this application. If the connected call cord or pillow speaker does not support this function, the audio reverts back to the patient station. The modules plug directly onto the back of patient stations and are subject to the same environmental requirements.

PM321B/PM322B Light Control Modules: The PM321B (for IR311-series or IR319-series) and PM322B (for IR312-series or IR320-series) modules allow SF301PL series, SF301DIG, SF401DIG or SF41-series pillow speakers to activate control relays that can be linked via dry contacts to control overhead and table lighting. The control relays are brought out on a separate header. (Refer to **Figure 20 on page 28**.)
WARNING: Connect only Class 2, Power Limited circuits (in accordance with ANSI/NFPA 70, ANSI/NFPA 99 and ANSI/UL®1069) to the PM321B or PM322B. If in doubt, contact the factory. The modules plug directly onto the back of patient stations and are subject to the same environmental requirements.

IR318 Resident Pull String Speaker Station: The IR318 is an audio-visual resident station for use when a pull string is desired as compared to a push-button call cord. The station provides a speaker for two-way audio communication, a pull string for call placement, a call reset button and indicators for call placement assurance and in-use status. See **IR3xx-series Station—General Information on page 9** for additional details.

RY351B Hill-Rom® SideCom® Adapter: The RY351B provides an interface for the Hill-Rom SideCom bed to the IR311-series, IR319-series, IR312-series (requires two RY351B) and IR320-series (requires two RY351B) patient stations. This enables the intercom, call placement indication, and in-use indication functions of the SideCom bed to work with the nurse call system. The SideCom's lamp and lighting controls are connected to the lighting control system and do not need to interface with the nurse call system. The RY351B interface also detects the disconnection of the (low voltage) signaling cable from the wall receptacle and places a noncancellable call to the programmed nursing Master Station. The RY351B electronics are mounted on an aluminum bracket that can be used to mount the device on a Steel City two-gang back box, part number 52171-1/2 and 3/4 with 52-C-13 single gang adapter ring. The RY351B must be within 6′ of the patient station to which it is connected. The Hill-Rom P376 series plug-in adapter must be installed within 10′ of the RY351B. The operating environment for the RY351B is 10-40°C with relative humidity not exceeding 80%.

IR310 Staff Station: The IR310 provides a communication point for staff members to call the master station for staff to staff communication. The device also has a special feature that is activated by turning on dip switch 7. This feature allows the device to call in as a patient station for applications in which call cords are not desired for patient call in. A call button, reset button, call-placed indicator and in-use status indicator are provided. See **IR3xx-series Station—General Information on page 9** for additional details.

Call Cords:

SF301/SF302-series	Single and Dual push button call cord, 7′ or 10' available (for SF380)
SF311	Push button call cord for 8P8C jack, 7' or 10' available (for IR311, IR312)
SF401	Push button call cord, 7′ (for IR319-series, IR320-series)
SF41-series	Pillow speaker, 8′ cord, intercom & controls for lights and TV (for IR311-series with PM311C, PM321; IR312-series with PM312C, PM322B)
SF401KIRL	Pillow speaker, 8' DIN plug, 2 light switches, intercom, channel keypad and IR

NOTE: Other options for geriatric call cords are available. Contact Sales for details.

Call cords are inserted into their associated patient stations and are subject to the same environmental requirements.

LI38x/LI38xLED Dome Light: The LI380 provides visual indication from the IR3xx-series stations and associated peripheral devices. Four bulbs and four colored lenses (LI380), four colored LEDs and single lens (LI380LED) allow the device to indicate all system call types with various flash rates and combinations. When connected to an IR315-series Duty Station, the light functions as a zone light. The LI series dome lights use the Steel City H2BD backbox with a 2GC plaster ring; refer to **Figure 2 on page 8** for mounting. The minimum dimensions for the backbox must be not less than 4"×4"×1½", and the minimum clearance from current carrying parts to dead metal parts must be no less than 0.5". The dome light must be located above or beside the doorway of the associated room, and must be mounted so that unobstructed visibility is provided. When being used as a zone light, the LI380 must be mounted at corridor heads or junctions so that facility staff members can readily identify the associated zone area. The LI380 must be within 50' of the patient station it is connected to. The LI380 requires a specific jumper connection to be made (from pin 1 of the 8-pin connector to pin 6 of the 15-pin connector on the associated patient station) to disable the lamp fault detection circuitry of the associated IR3xx-series station it is connected to (refer to **Figure 15 on page 23**). The operating environment for the LI380 is 10-40°C with relative humidity not exceeding 80%. See **Wiring Installation on page 12** for additional details.

LI386 Dome/Zone Light: The LI386 provides the same indication functionality as the LI380 and includes support electronics to make it an addressable device. This device is suitable for stand-alone equipment applications and zone indication applications. **NOTE**: This device does not support all of the standard peripheral devices (refer to **Figure 17 on page 25**). Turning on dip switch 7 activates the zone indication feature. See LI380 Dome Light (above) for location and environmental requirements.

SF-series Peripheral Devices—General Information: The SF-series peripheral devices' electronics are mounted on flame retardant ABS plastic faceplates. SF-series devices must be mounted within 50' of the patient station to which it will be connected. They are mounted on single-gang rings or boxes (minimum ring opening not to be less than 1¾" × 2¾"). The minimum clearance from current carrying parts to dead metal parts must be no less than 0.5". Plug-on connectors are provided for easy installation. See the **Wiring Installation on page 12** for additional details.

SF337C Bath/Emergency Switch: The SF337C allows patients to initiate a bath call to inform staff members that they require assistance in bathroom or restroom areas. The device is designed to be mounted in wet areas when properly installed (using the included gaskets for the panel and screws). The device can be activated by hand with the red pull down lever, or by pull-cord (if installed). It also provides a call placed indicator.

This device is typically located in toilet, bath and shower areas, and is mounted at a height convenient for use. If the device is being mounted to a tile wall or other irregular surface, the installer must provide extra sealant to fill tile seam points or other gaps. If the device is being used with pull-cord activation, the included cord must be installed through the guide tab and red pull-down lever and secured with a double knot. Mounting location and cord length must be such that a prone patient can reach the call cord to activate the device. The operating environment for the SF337C is 10-40°C, and the device is water resistant when correctly installed. See **SF-series Peripheral Devices—General Information** for additional details.

SF340B Bath/Emergency Switch: The SF340B provides the same operational functionality as the SF337C, except that it is not suitable for moist or wet environments. The operating environment for the SF340B is 10-40°C with relative humidity not exceeding 80%. See **SF-series Peripheral Devices—General Information** for additional details.

SF341B Supervised Code Call Station: The SF341B allows patients and staff members to initiate high priority “CODE” calls. The device incorporates a supervisory circuit to monitor the wiring connection to the patient station, as well as a call placed indicator. The device is activated by hand operation of the blue pull-down lever. The SF341B must be located for convenient operation in areas that require code call initiation (such as ICU/CCU areas). The environment for the SF341B is 10-40°C with relative humidity not exceeding 80%. See **SF-series Peripheral Devices—General Information** for additional details.

SF381 Standalone Emergency Switch: The SF381 provides the same operational functionality as the SF337C, except that it is not suitable for moist or wet environments. The operating environment for the SF381 is 10-40°C with relative humidity not exceeding 80%. See **SF-series Peripheral Devices—General Information** for additional details. The SF381 differs electronically from the SF337C or SF340B devices in that it incorporates electronic circuitry to support standalone functionality similar to that of an IR3xx-series Station. Information that applies to this aspect of the device can be found in the first paragraph of **IR3xx-series Station—General Information**.

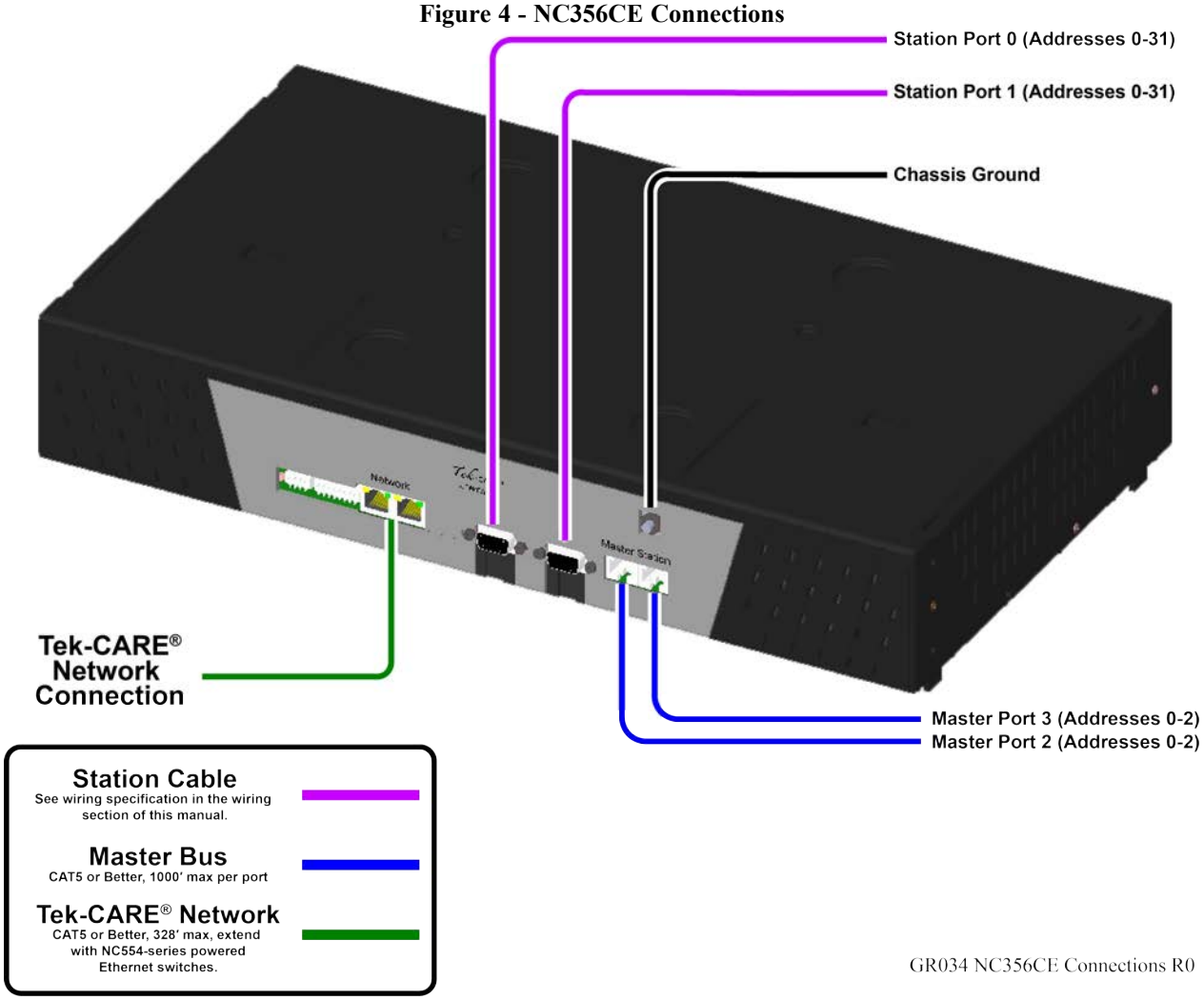
SF382 Standalone Code Call Station: The SF382 provides the same operational functionality as the SF341B. The operating environment for the SF382 is 10-40°C with relative humidity not exceeding 80%. See **SF-series Peripheral Devices—General Information** for additional details. The SF382 differs electronically from the SF341B device in that it incorporates electronic circuitry to support standalone functionality similar to that of an IR3xx-series Station. Information that applies to this aspect of the device can be found in the first paragraph of **IR3xx-series Station—General Information**.

SF350B Nurse/Aide Presence Station: The SF350B works in conjunction with the nurse/aide presence registration features of the nurse call system. It allows nurse and aide staff to register their presence with a simple button push, and facilitates the transfer of nurse follower features from room to room (when activated at the master station). A nurse registration button and indicator, and an aide registration button and indicator are provided. The SF350B must be located for staff convenience, typically within the associated room near its entrance. The environment for the SF350B is 10-40°C with relative humidity not exceeding 80%. See **SF-series Peripheral Devices—General Information** for additional details.

Wiring Installation

The NC356CE includes two master station ports, two patient station ports and PK356 port on the rear of the module. Interconnection cable harnesses, CT318, (also known as “whip” or “pigtail” connectors) are provided for the two patient station ports with the central equipment. Connect the PK356 Power Supply to the NC356CE using the included 15-pin serial cable. Each port type is separately described below, with the specifics of connection.

Figure 4 - NC356CE Connections



Master Station Ports: Each master station port supports three master stations and a maximum of 1000' of interconnecting cable. CAT5e wiring or better is needed for the master station. Up to 6 master stations can be connected to a NC356CE Module. Each NC404TS and NC415G3 Master Station must be assigned a unique address using the dip switches on the back of the master. The last NC415G3 or NC404TS Master Station that is furthest away from the CE should have a dip switch 5 turned ON for the EOL resistor.

Figure 5 - NC415G3 Master Station Connections

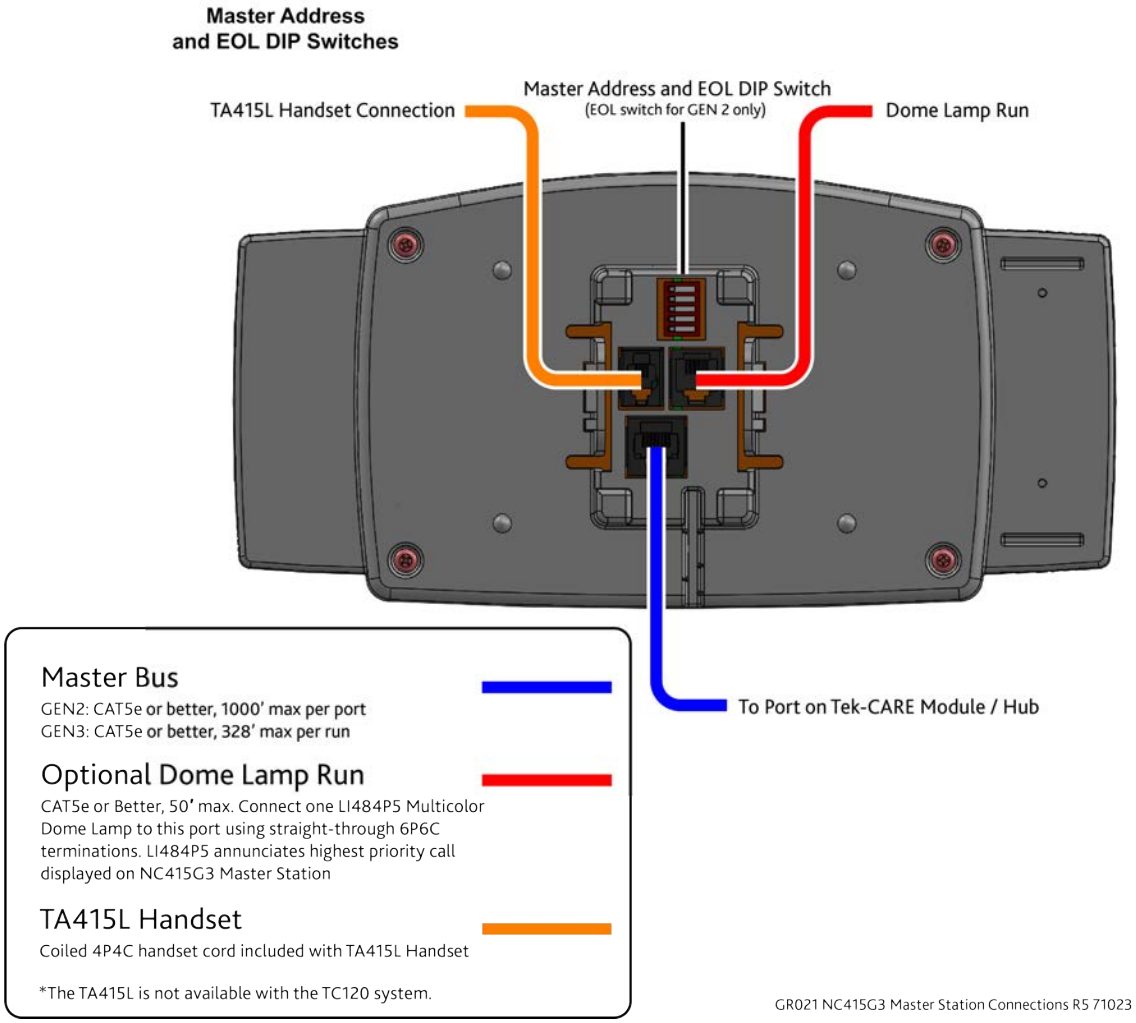


Figure 6 - NC404TS Master Station Connections

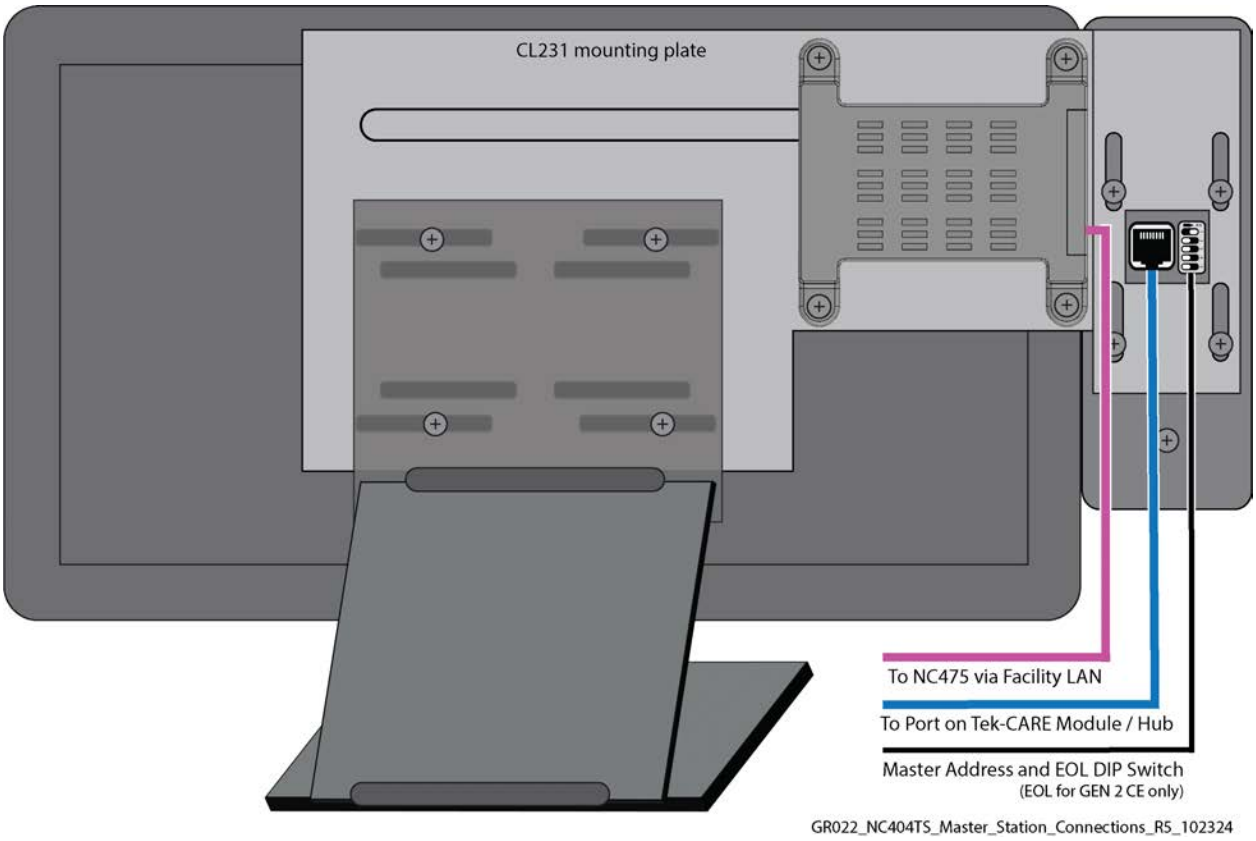


Figure 7 - NC403/4TS Monitor Connections

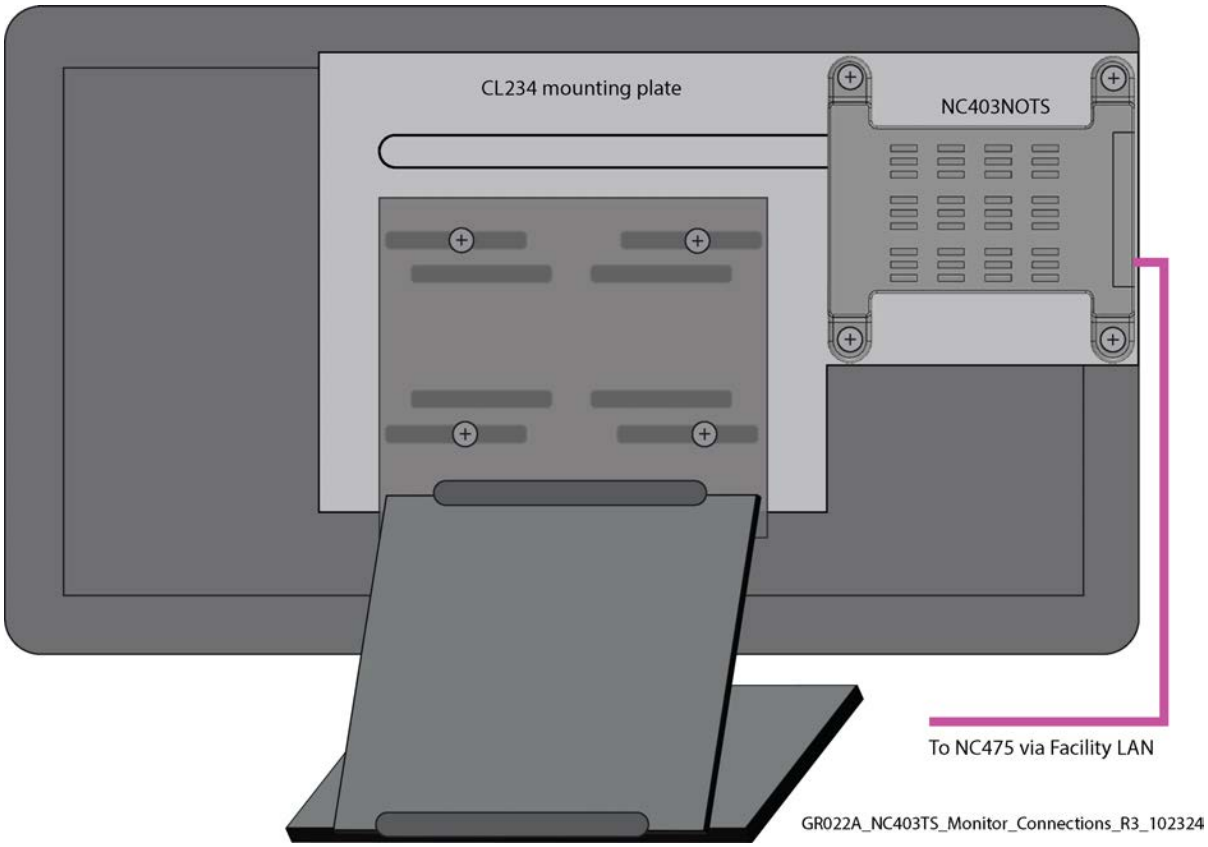
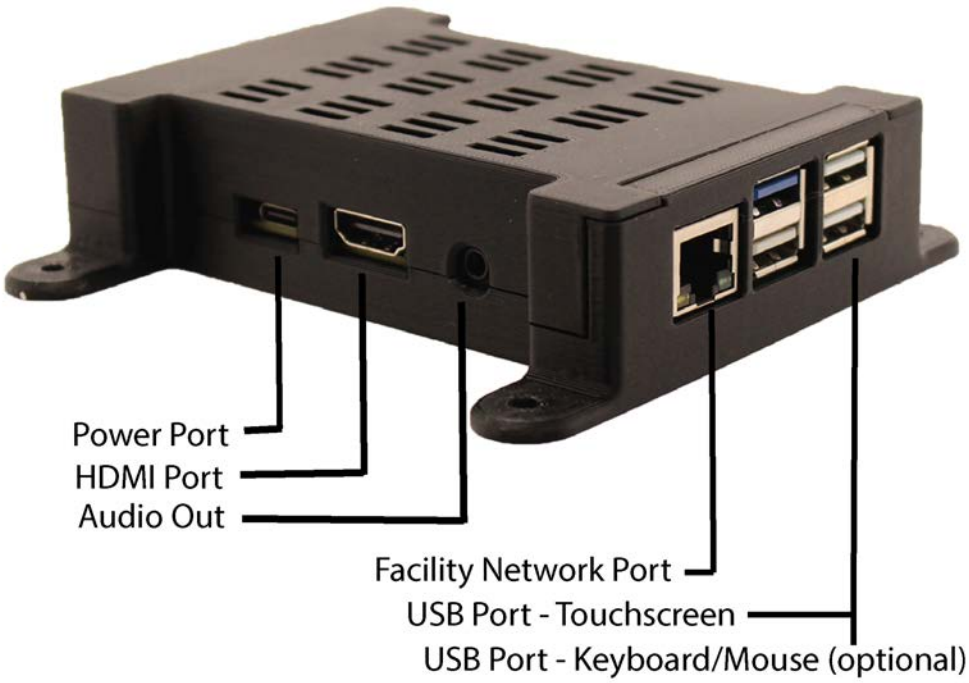


Figure 8 - NC403/4TS Controller Port ID



GR022B_NC403/4TS_Controller_Port_ID_R1_102224

Audio Adjustments

The audio bus of the Tek-CARE300III is susceptible to electronic noise induced by other building systems. Most of this noise can be removed by use of the trim pots on each audio bus port. In order to reach the trim pots, a very small flathead screwdriver (1/16" blade) is required.

1. Connect an NC415G3 or NC404TS Master Station directly to the NC356CE module using a short patch cable. You must be able to reach both the NC356CE module and the NC415G3/NC404TS Master Station at the same time during this procedure.
2. Dial a Station ID that is connected to Port 0 from the master station, and establish an audio connection using the Talk button, not the handset, of the master station.
3. Release the TALK button. You should now have an open audio channel, and be listening to the station you dialed through the speaker on the connected master station.
4. Using a flathead screwdriver, turn the potentiometer for Port 0 approximately 12 turns clockwise. This ensures that the potentiometer is maxed out. Note that the potentiometer will not stop at the end of its travel, but will spin freely. This is normal.
5. With the potentiometer fully clockwise, you may hear a considerable amount of background and data noise on the open audio channel. This is normal.
6. Begin turning the potentiometer counterclockwise. After six full rotations, the potentiometer will be in the center of its travel.
7. Make small clockwise and counterclockwise adjustments to the potentiometer while listening to the audio connection. Too far clockwise or counterclockwise will induce noise on the audio bus.
8. Adjust the potentiometer so that the noise level on the channel is as low as possible. Remove your screwdriver from the potentiometer and clear the audio connection.

Finally, dial a Station ID that is connected to Port 1 from the master station. Repeat the process outlined above while adjusting the audio trim potentiometer for Port 1 of the NC356CE module.

Below is the wiring specifications for the interconnecting cable for the patient stations.

Data Wires:	#18 AWG, 1 twisted pair (8 twists per ft.) plus 1 conductor (3 conductors, 7 str. BC) with 100% aluminum/mylar shield and #20 AWG TC drain wire. Nominal insulation 0.017", nominal OD 0.245" and capacitance <24pF/ft. Recommended conductor colors are ORANGE, YELLOW and GREEN. Overall jacket. **IMPORTANT:** The capacitance on the data wires must be <24 pF/ft. If the cable capacitance exceeds this level, data signal degradation can occur and interfere with normal system operation.
Power Wires:	#18 AWG, 3 conductors (7 str. BC) with 100% aluminum/mylar shield and #20 AWG TC drain wire. Nominal insulation 0.009" and nominal OD 0.175". Recommended conductor colors are BROWN, RED and BLUE. Overall jacket.
Audio Wires:	#18 AWG, 1 twisted pair (8 twists per foot, 2 conductors, 7 str. BC) with 100% aluminum/mylar shield and #20 AWG TC drain wire. Nominal insulation 0.017", nominal OD 0.235". Recommended conductor colors are VIOLET and GRAY. Overall jacket.
Ground Wires:	#16 AWG, 1 conductor (26 str. BC) with nominal OD 0.101". Recommended color is BLACK.

Patient Station Ports: Each patient station port supports up to 32 patient stations and a maximum of 1000′ feet of interconnecting cable. This maximum distance does not include peripheral wiring connections, and only reflects the common wiring between all of the stations on that particular port and their associated connection to the NC356CE. The following must be observed for patient station wiring:

- Each port supports up to 32 addressable stations and each cable run on that port supports a maximum of 16 addressable stations. The total length of these runs per port shall not exceed 1000'.
- Do not run cables to the bottom of the patient station back boxes, because there is no access for cable passage.
- At all splice points, the common cable shields must be kept isolated from all other circuits and fed through as any other conductor would be. The shields must be continuous through the entire run and must be isolated and taped back at the end of the run. When connecting the common cable to the central equipment, the shields will be connected to the shields of the interconnecting wire harness, CT318 (also known as “whip” or “pigtail” connector).
- Each patient station port has one audio path. If a system is known to have a small quantity of stations that will occupy only one or two ports, the installer should consider redistributing the devices evenly among all of the available station ports. This enables all of the available audio paths for use in system operation, allowing two simultaneous paths, and increasing call response efficiency.

Figure 9 - IR3xx-series Stations Dip Switch Location and Switch Values

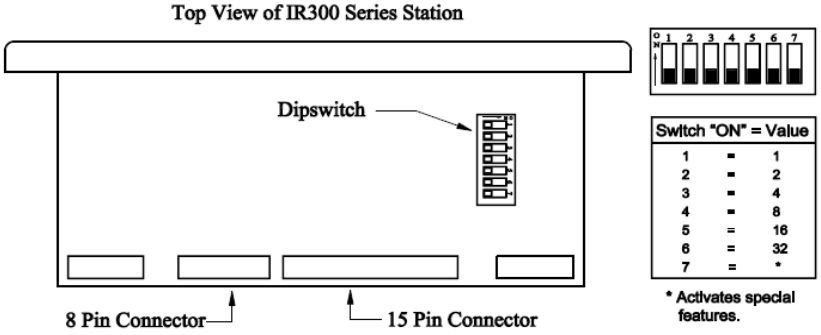
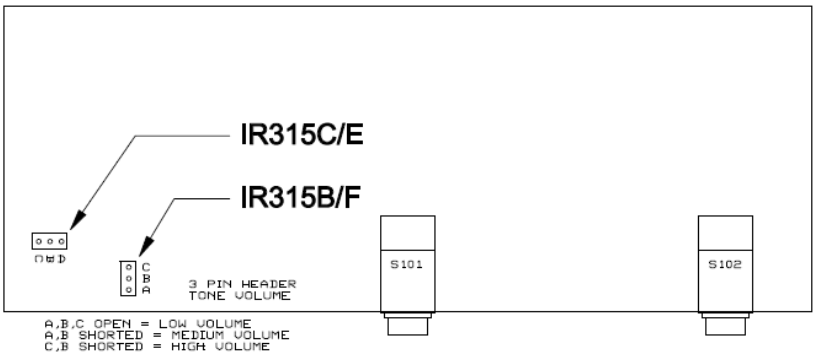


Figure 10 - IR315-series Duty Station Layout



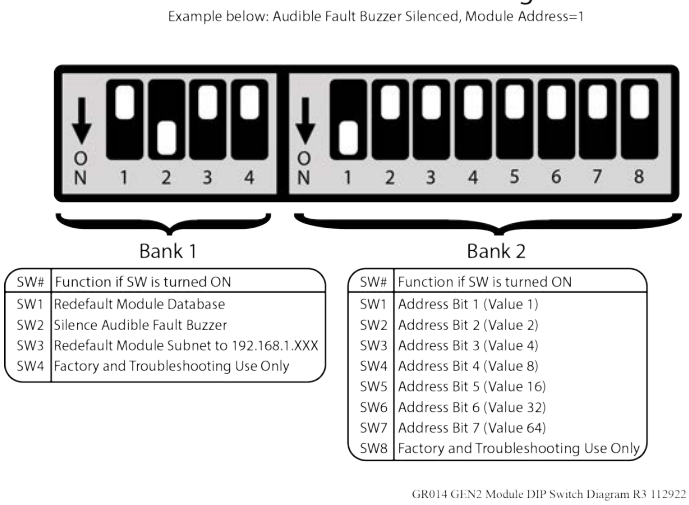
NC356CE Module: This device is entirely configured through the LS450 ConfigTool software. The NC356CE enables legacy stations to function on the Tek-CARE Network.

Things to consider when updating to an NC356CE from an NC351A:

- Go over existing "as-built" wiring plans to review where wiring will need to be upgraded. If existing wiring plans cannot be found, a site survey must be done to configure the current topology.
- Keep in mind the NC356CE can only hold 64 stations per CE, with addresses of 0-31 per station port. Any original station addresses above 31 needs to be revised to fit the addressing scheme for the station port on the NC356CE.
- If updating the system from a PM456 to an NC356CE, the existing CT318RT connector will not fit on the NC356CE. The CT318 included with the NC356CE will fit the module perfectly. However, the header on the CT318 may be swapped with the CT318RT right angle connector header to avoid rewiring.

On the front of the NC356CE Module, you will find a bank of dip switches. These dip switches are used to configure various options on the CE module and to provide an address for the module itself. See the dip switch diagram for the NC356CE below.

Figure 11 - GEN2 Tek-CARE Module Dip Switch Diagram



IR3xx-series Stations: These devices are addressed by turning on and off the 7 available dip switches located on each device. Stations that occupy the same port must all have unique addresses (ranging from 00 to 31). The 7-switch dip switch uses a binary configuration method (1 has a value of 1, 2 a value of 2, 3 a value of 4, 4 a value of 8, etc.). Using these values, the station address is represented by the sum of the values of all switches that are turned on. For example, if switches 2 (value 2) and 5 (value 16) are turned on, the address is 18 (2+16=18). Using this method, values of 00 to 31 can be generated using only switches 1 through 6.

The four-digit Station ID is an amalgamation of the Module Address, the port the station is plugged into, and the dip switch address of the station. For example. if the module address is 3 and the station is addressed 30 in the lower port 0, the Station ID would be 0330. If the station is addressed as 1 in the higher port 1, it would be 0332. The LS450 ConfigTool software will display these Station IDs on the **Stations** page which should be edited to be architectural room names. See IL855 LS450 ConfigTool Manual for further details.

IR315 Duty Station: In addition to the dip switch address settings, the IR315 also has a tone control adjustment (via three pin header) to set annunciation tone levels.

SF380 Single Patient Station/ F381 Standalone Bath Station/SF382 Standalone Code Station: Refer to **Figure 23 on page 31** for dip switch and jumper (shunt) settings. **NOTE**: SF380 stations must be programmed for Personal Attn. Priority Level.

System and Peripheral Wiring Diagrams

Figure 12 - Tek-CARE300III Block Wiring Diagram

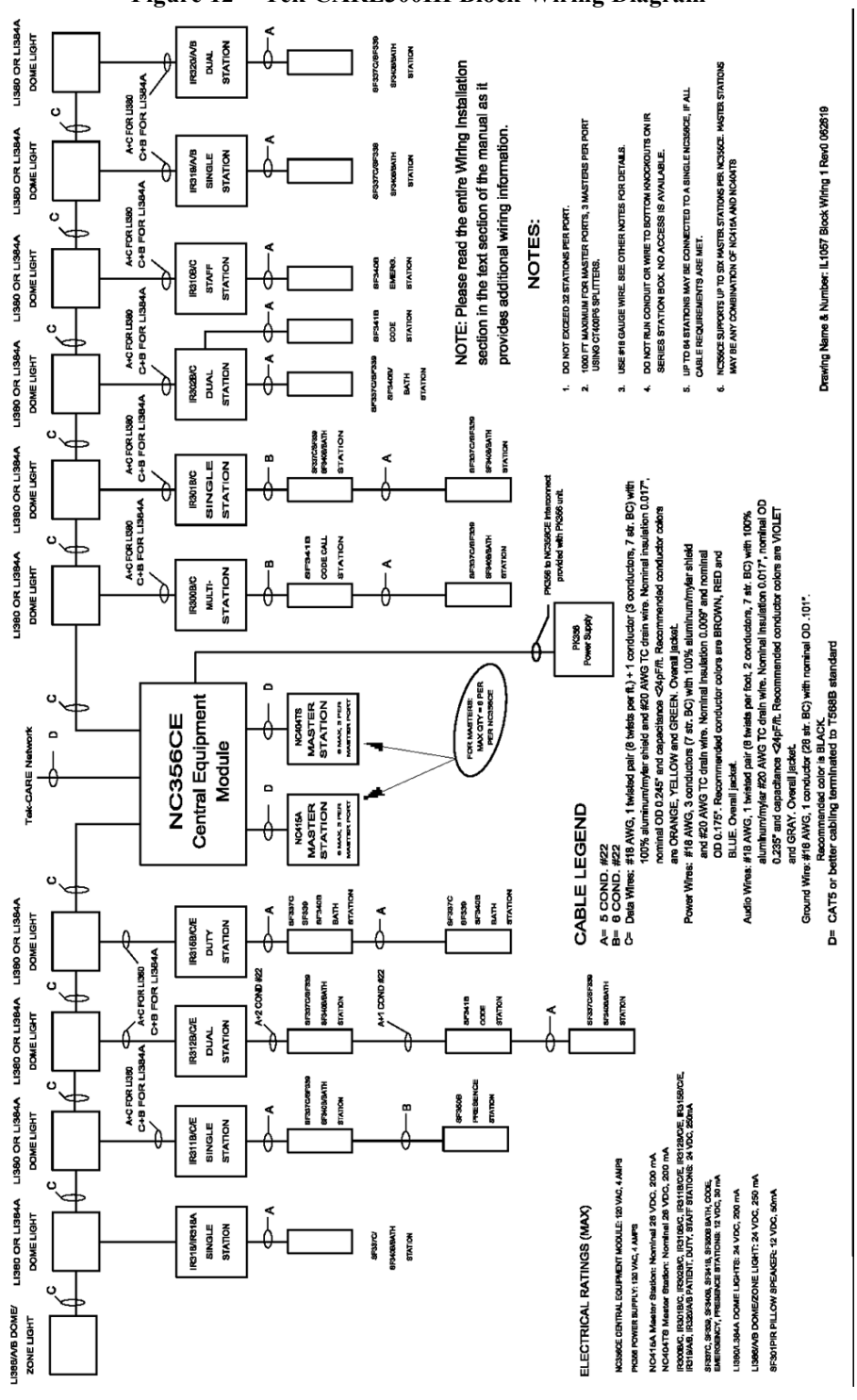


Figure 13 - NC356CE Wiring Diagram Using Individual Cables

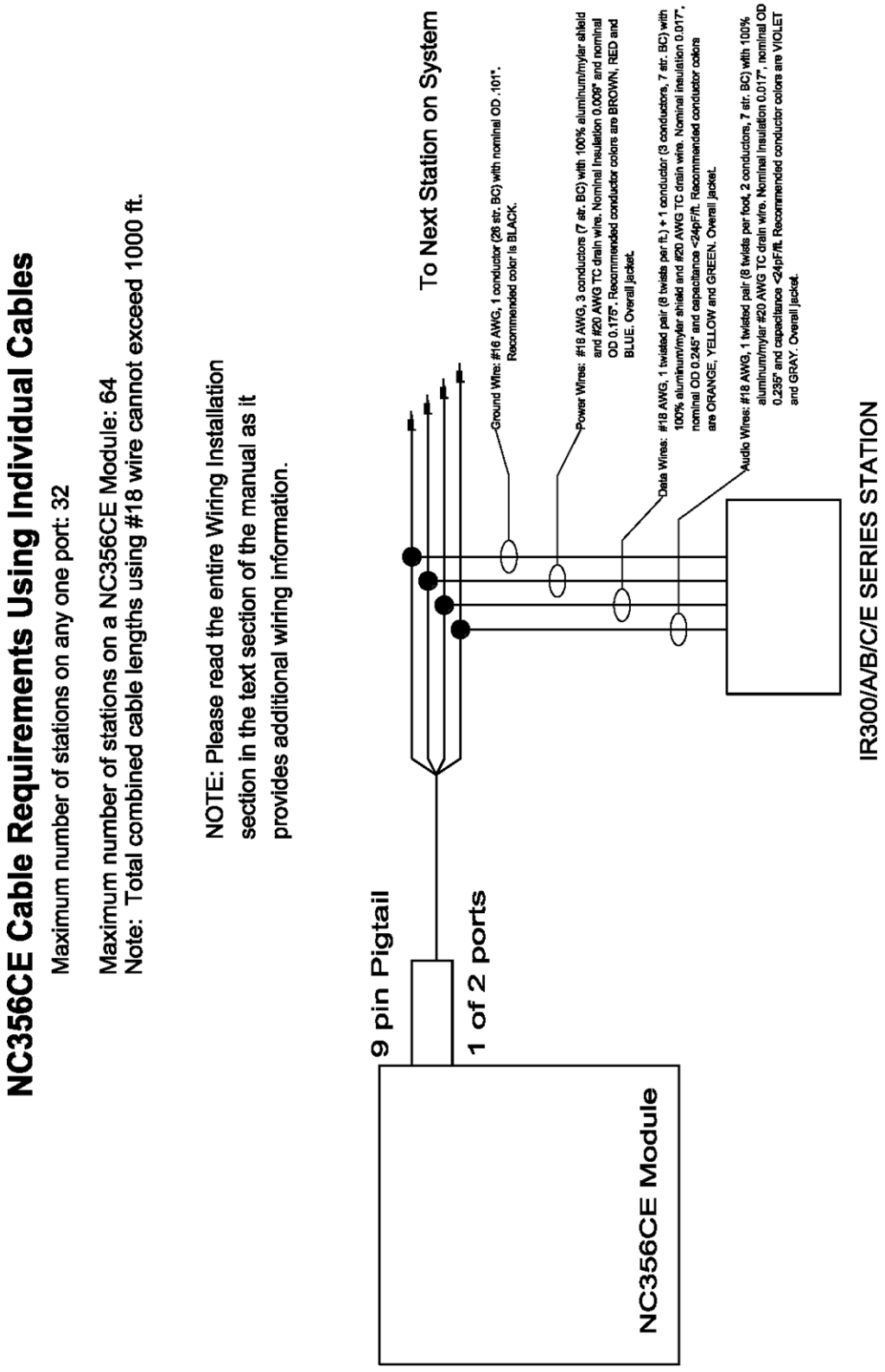


Figure 14 - Connector Circuit Interconnections for Addressable Stations

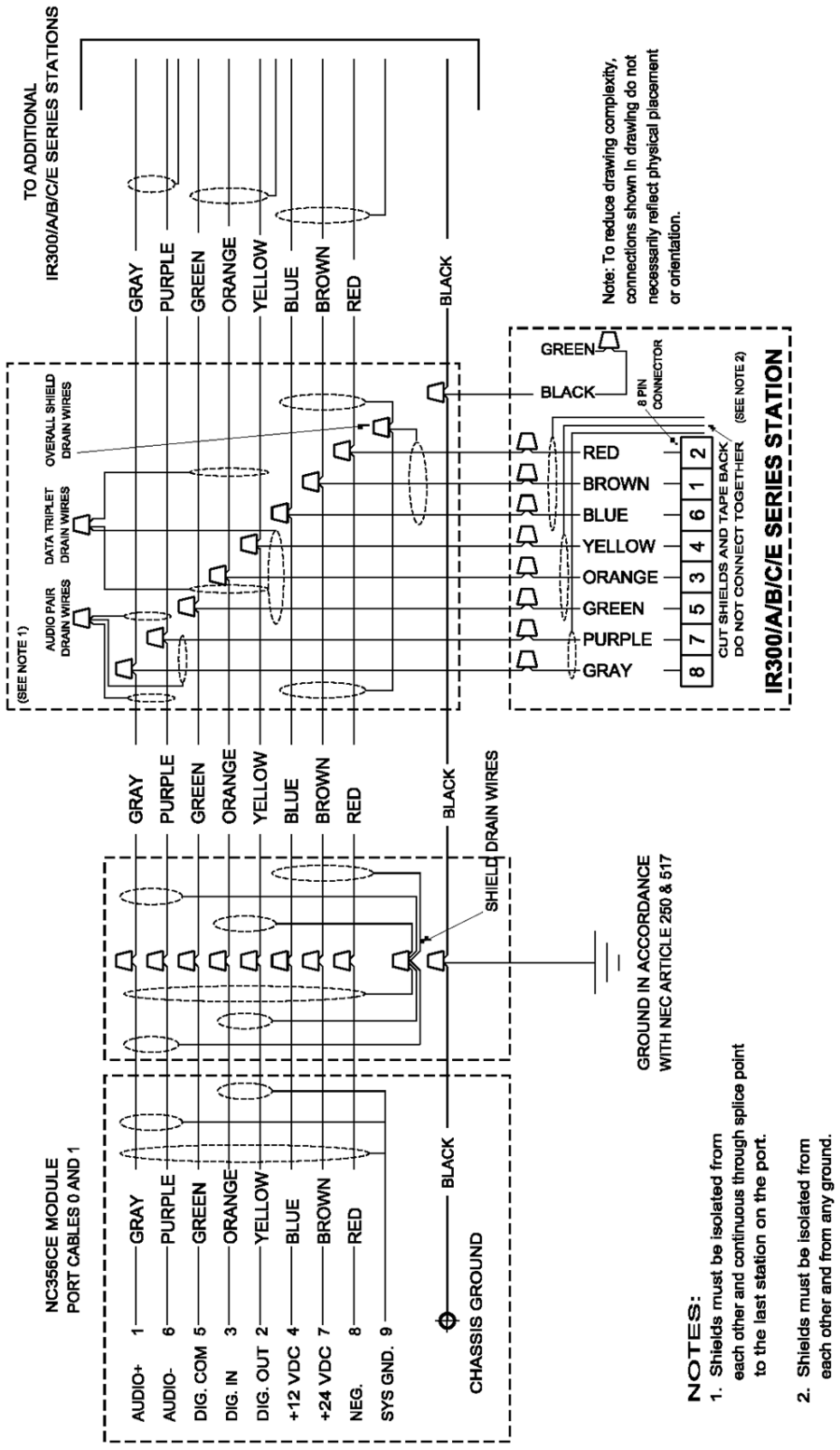


Figure 15 - IR3xx-series Connections to Peripheral Devices

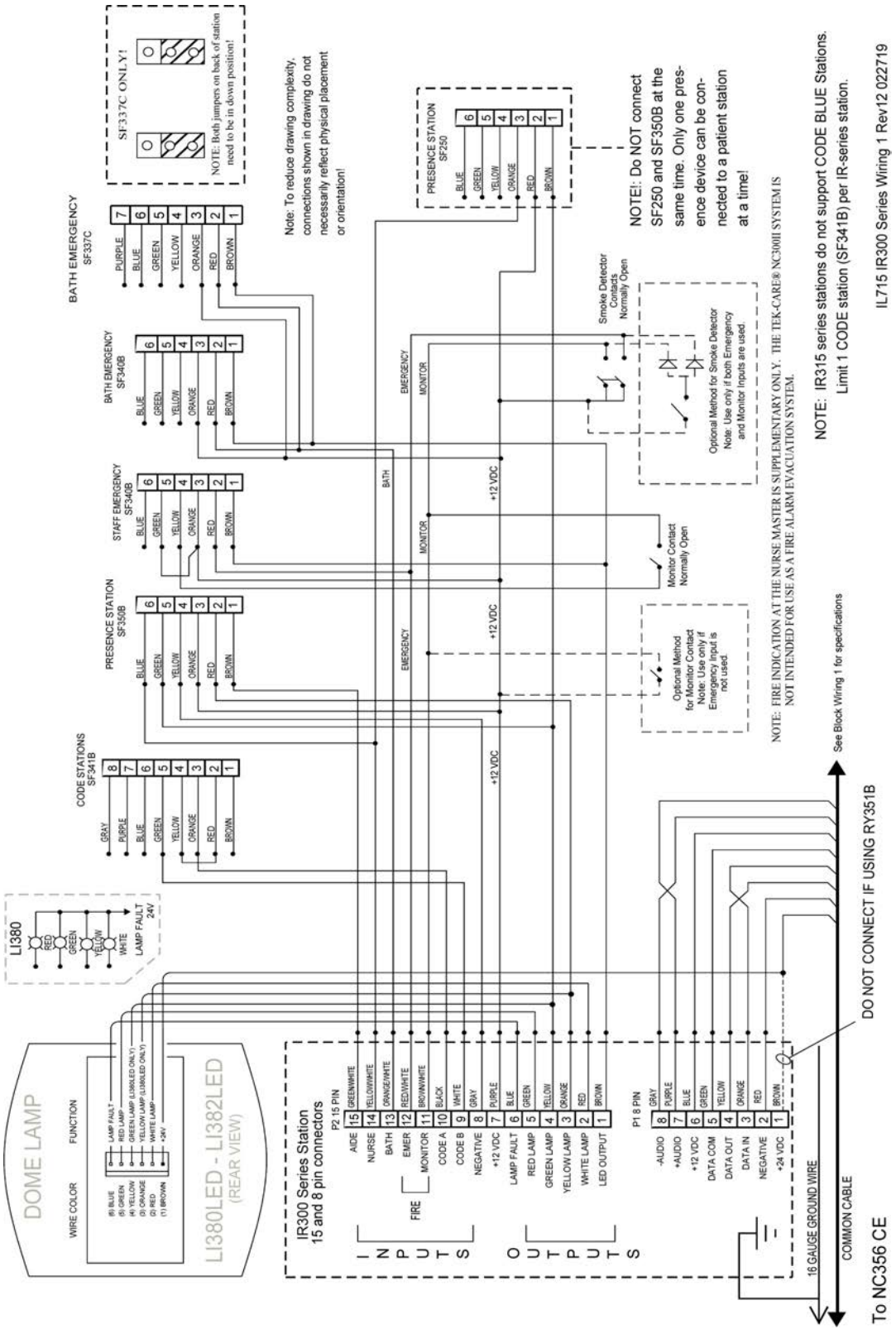


Figure 16 - IR3xx-series Connections with Supervised Dome Light

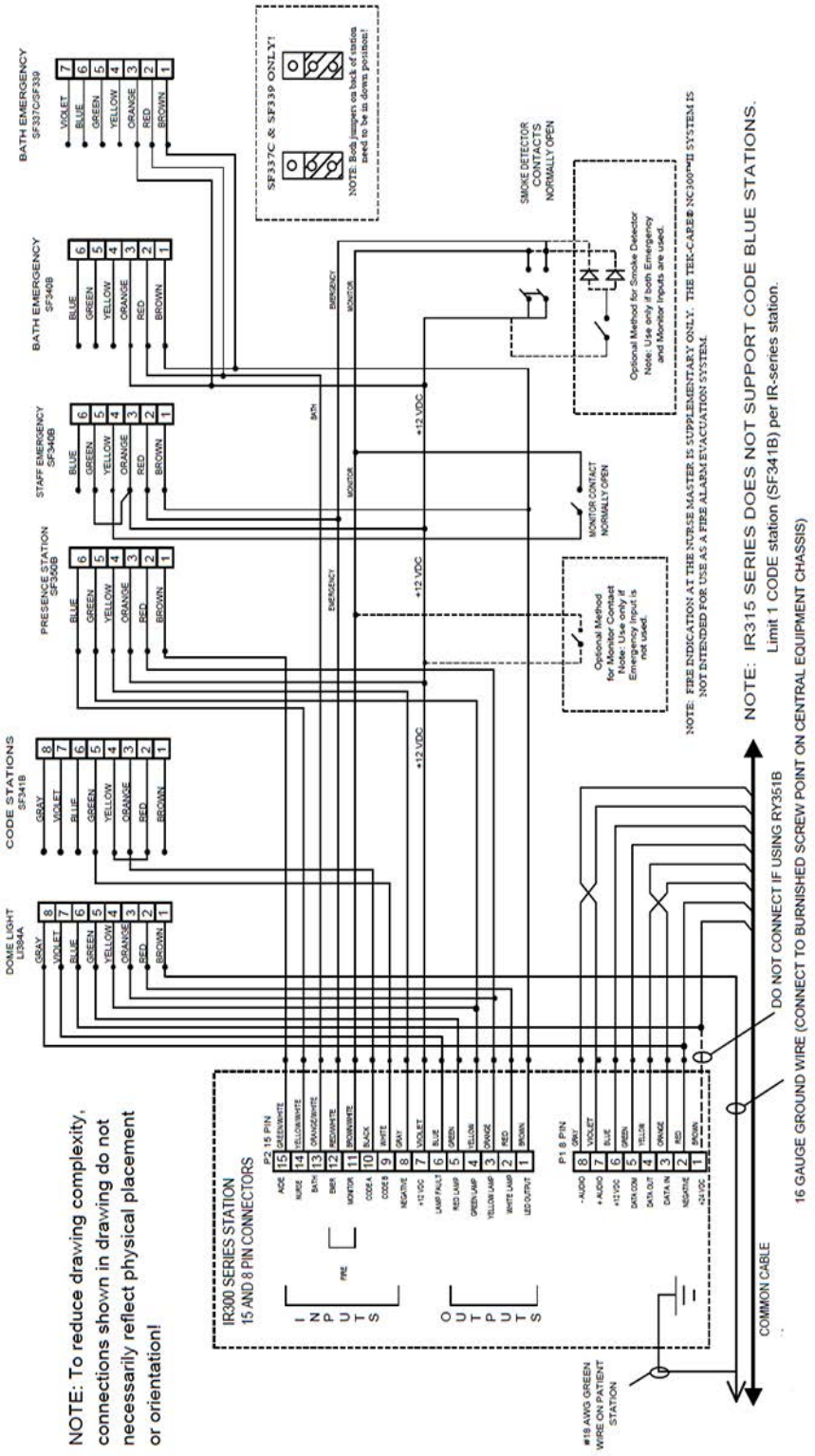


Figure 17 - LI386-series Dome/Zone Light Wiring Diagram

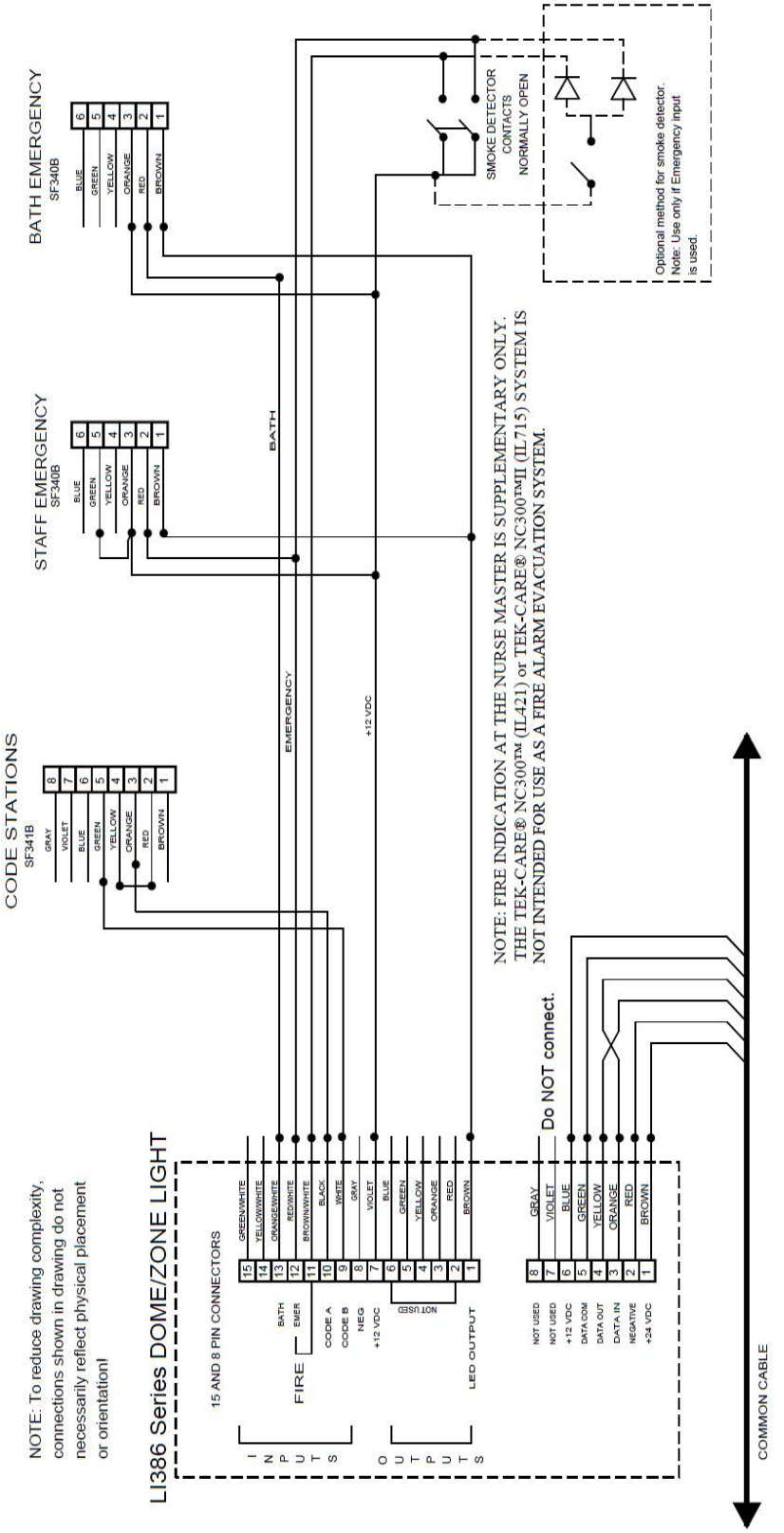


Figure 18 - RY351B Wiring Diagram

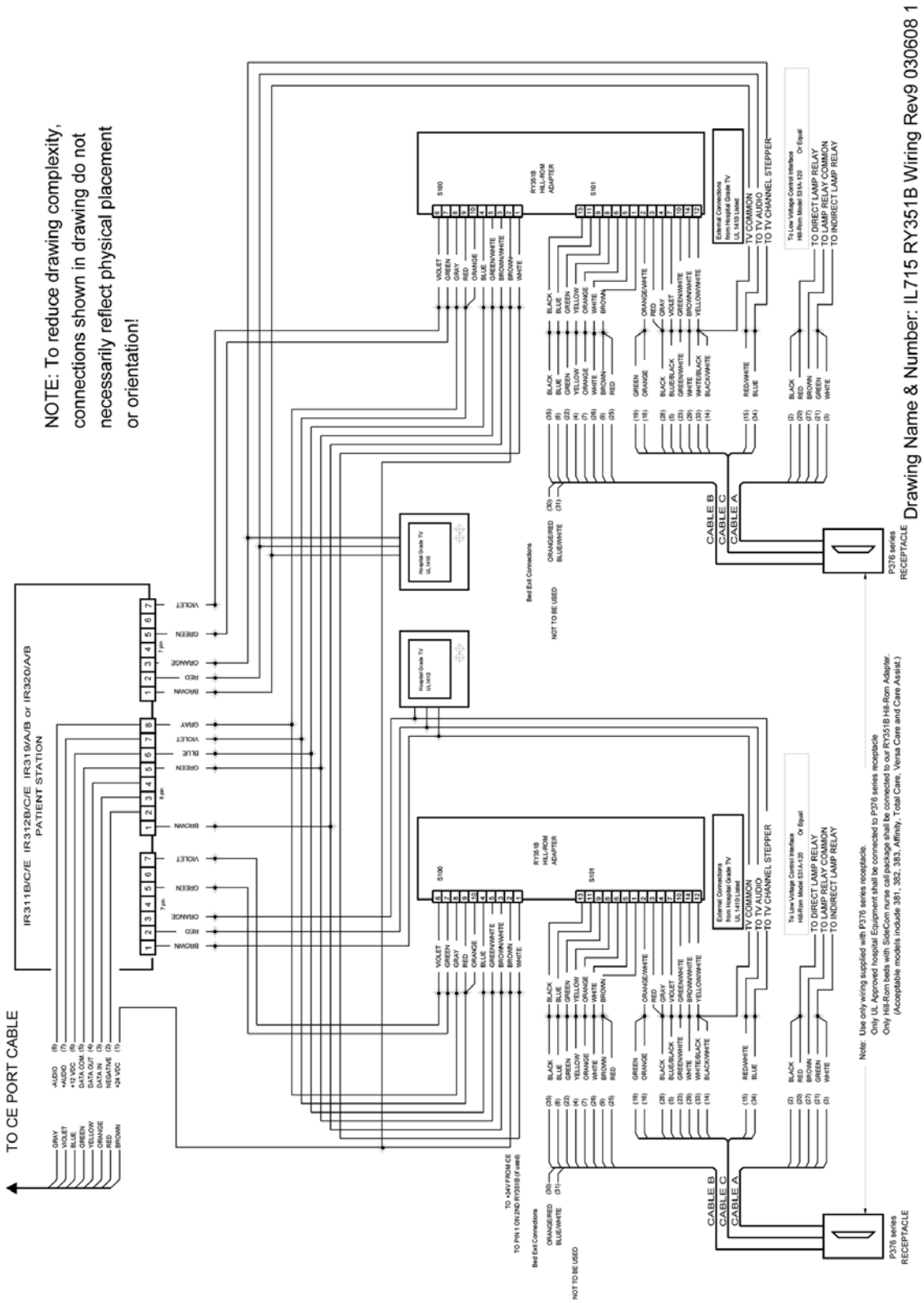


Figure 19 - RY350B Wiring Diagram

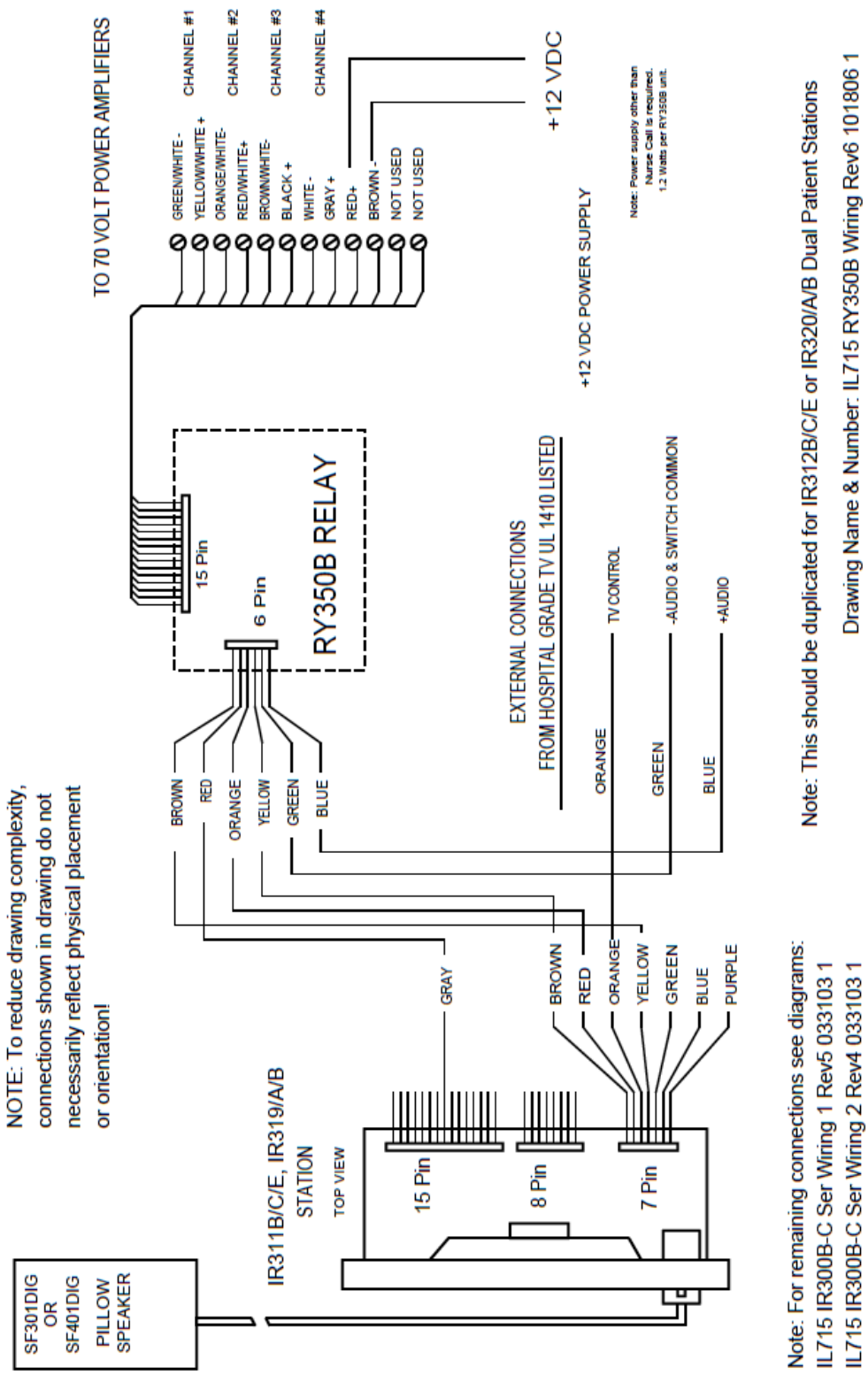


Figure 20 - PM321/PM322 Lamp Module Wiring Diagram

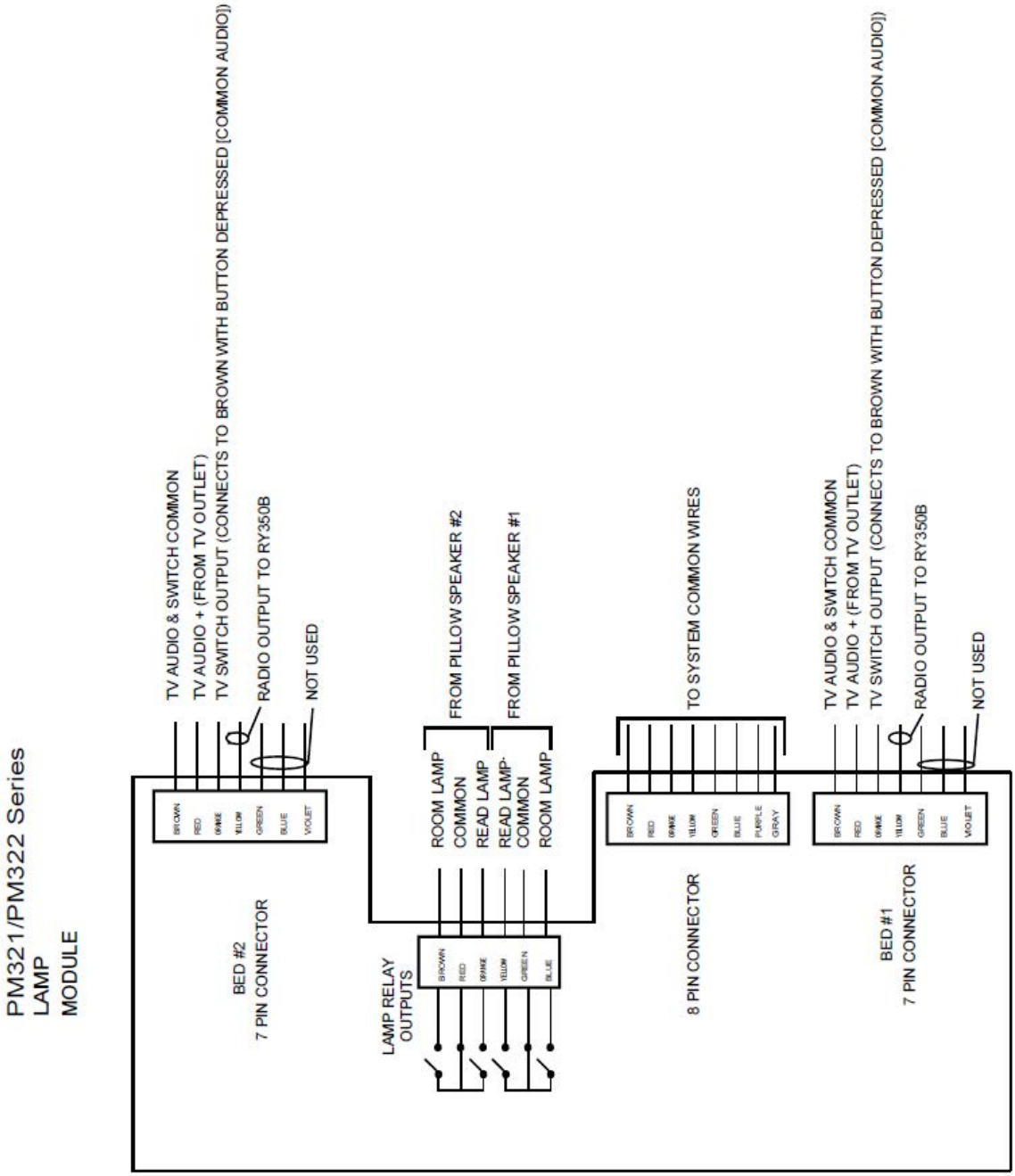


Figure 21 - LI384 Multiple Stations

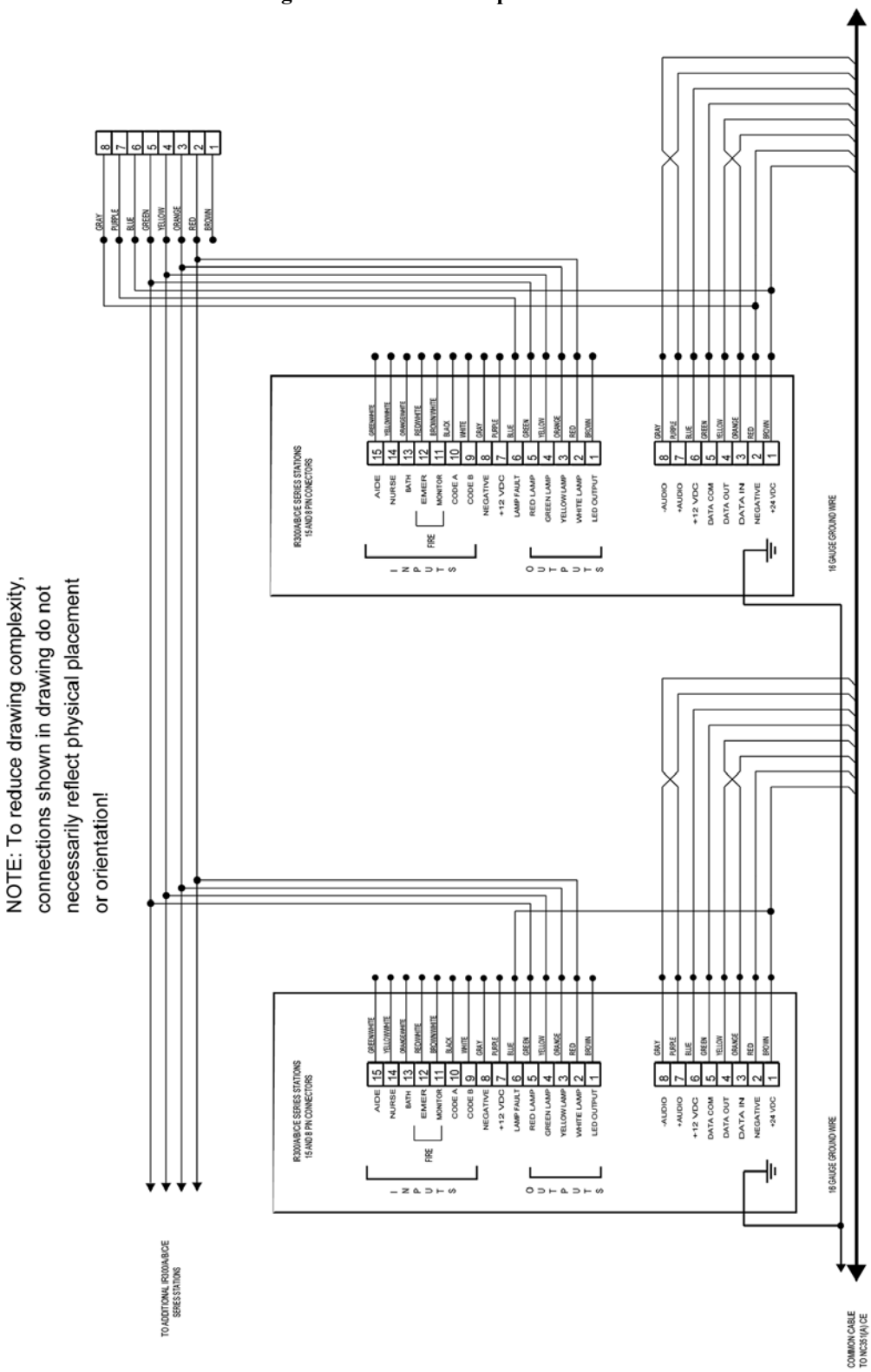


Figure 22 - 6 & 7-PIN Connector Outputs for IR3xx-series Stations

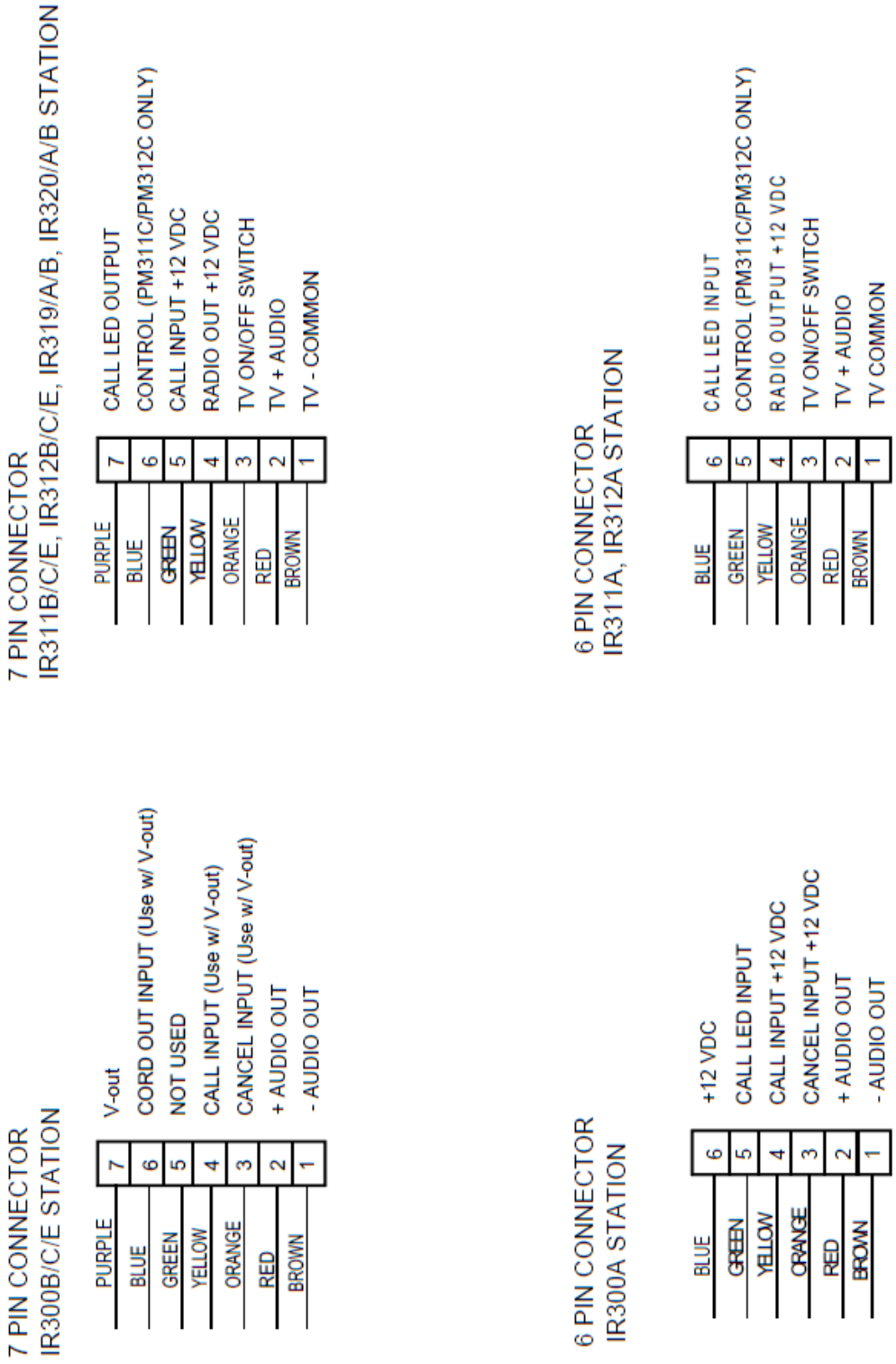


Figure 23 - SF380A Connections to Peripheral Devices

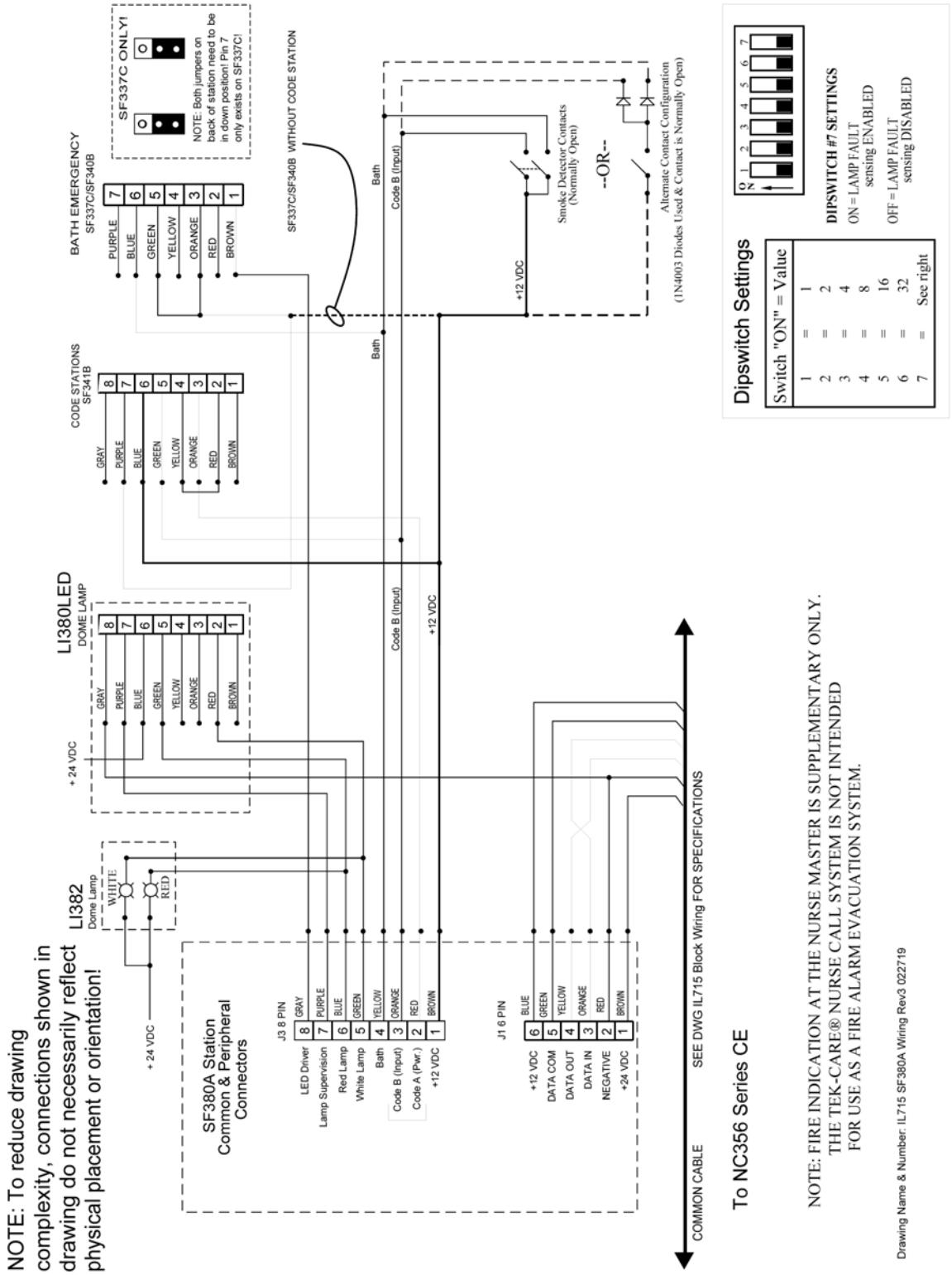


Figure 24 - SF380P Connections to Peripheral Device

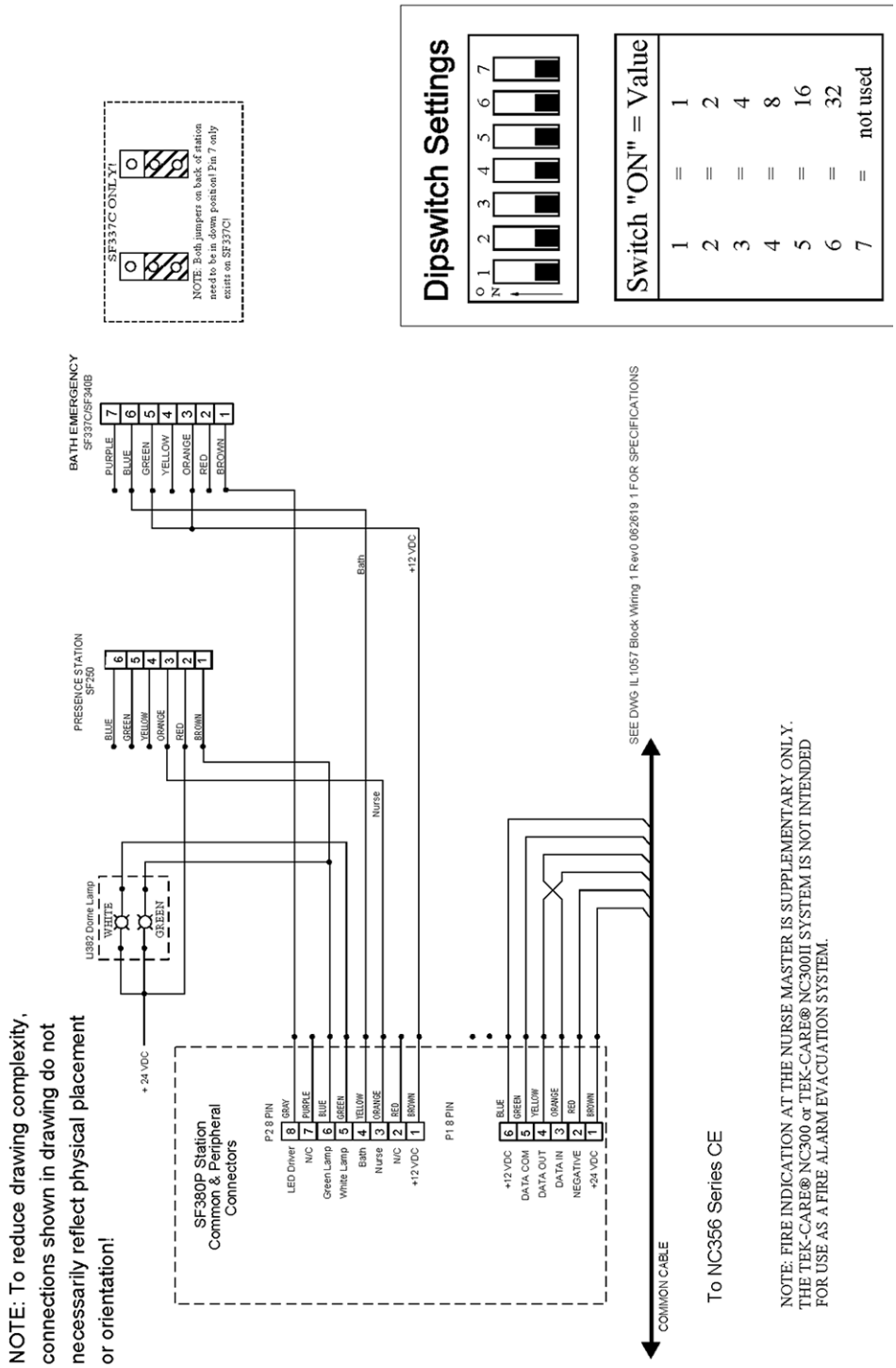


Figure 25 - SF381/SF382 Wiring Diagram

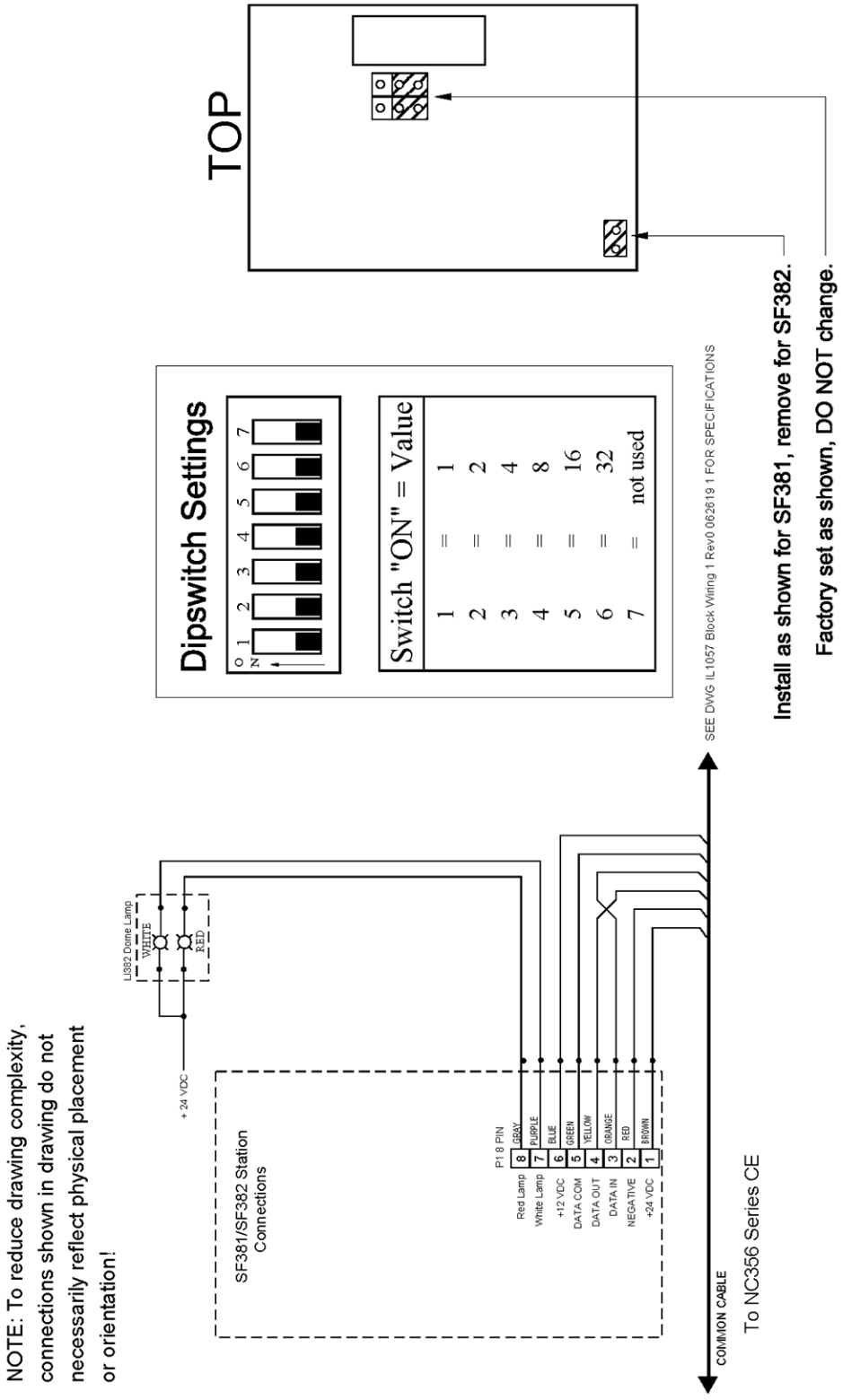


Figure 26 - SF380A Wiring Diagram

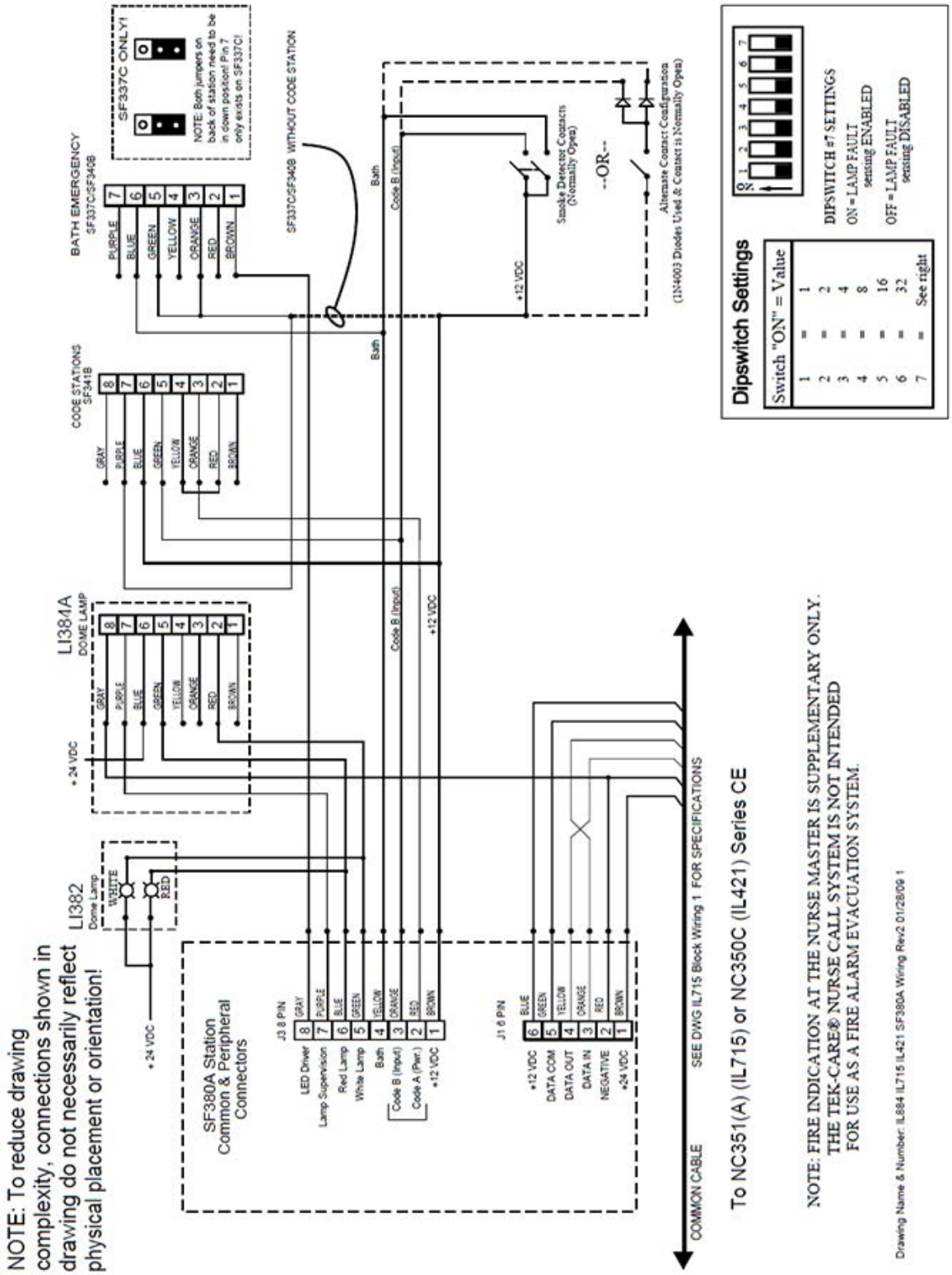


Figure 27 - LI484LED Wiring Diagram

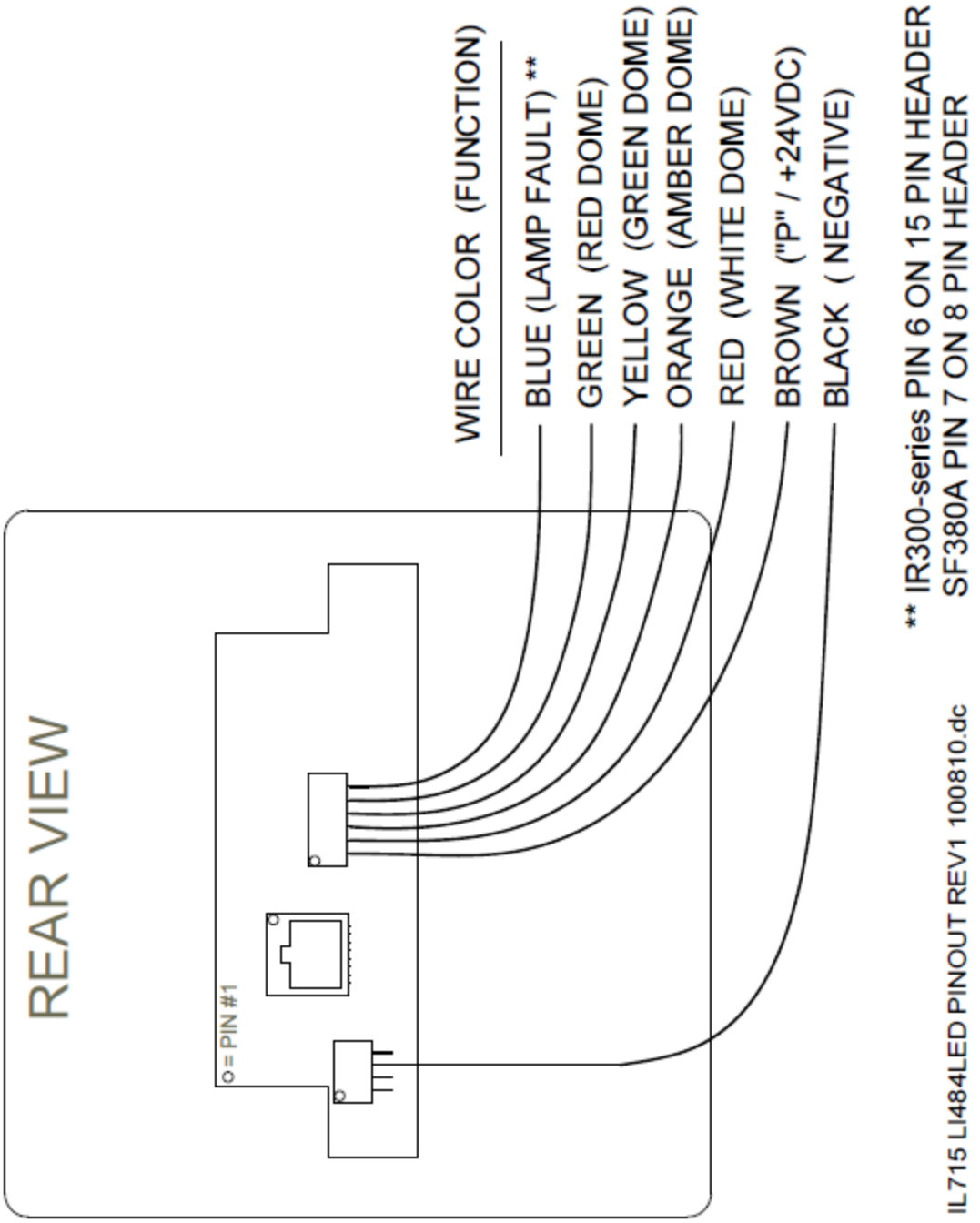


Figure 28 - LI380LED Wiring Diagram

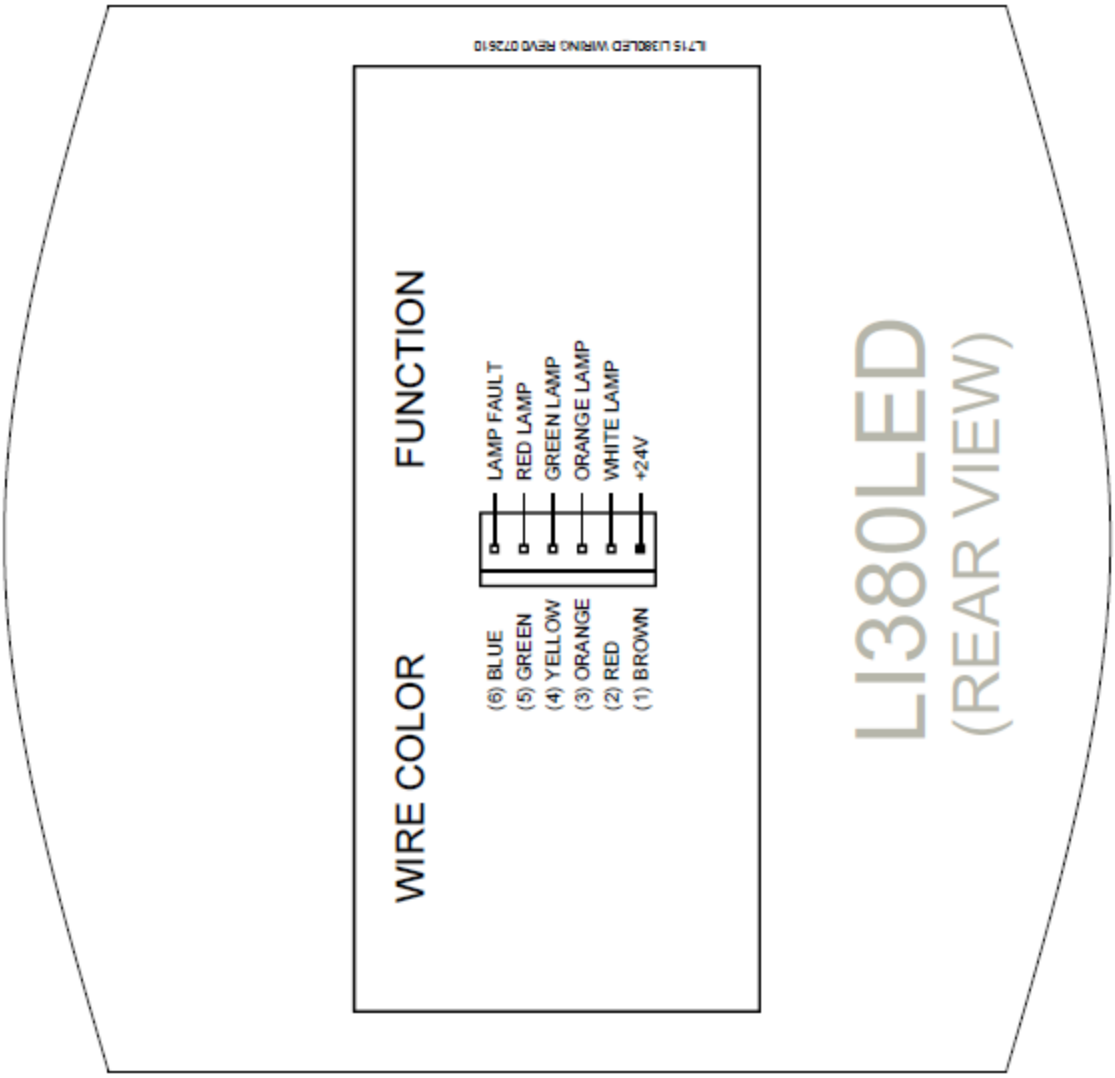
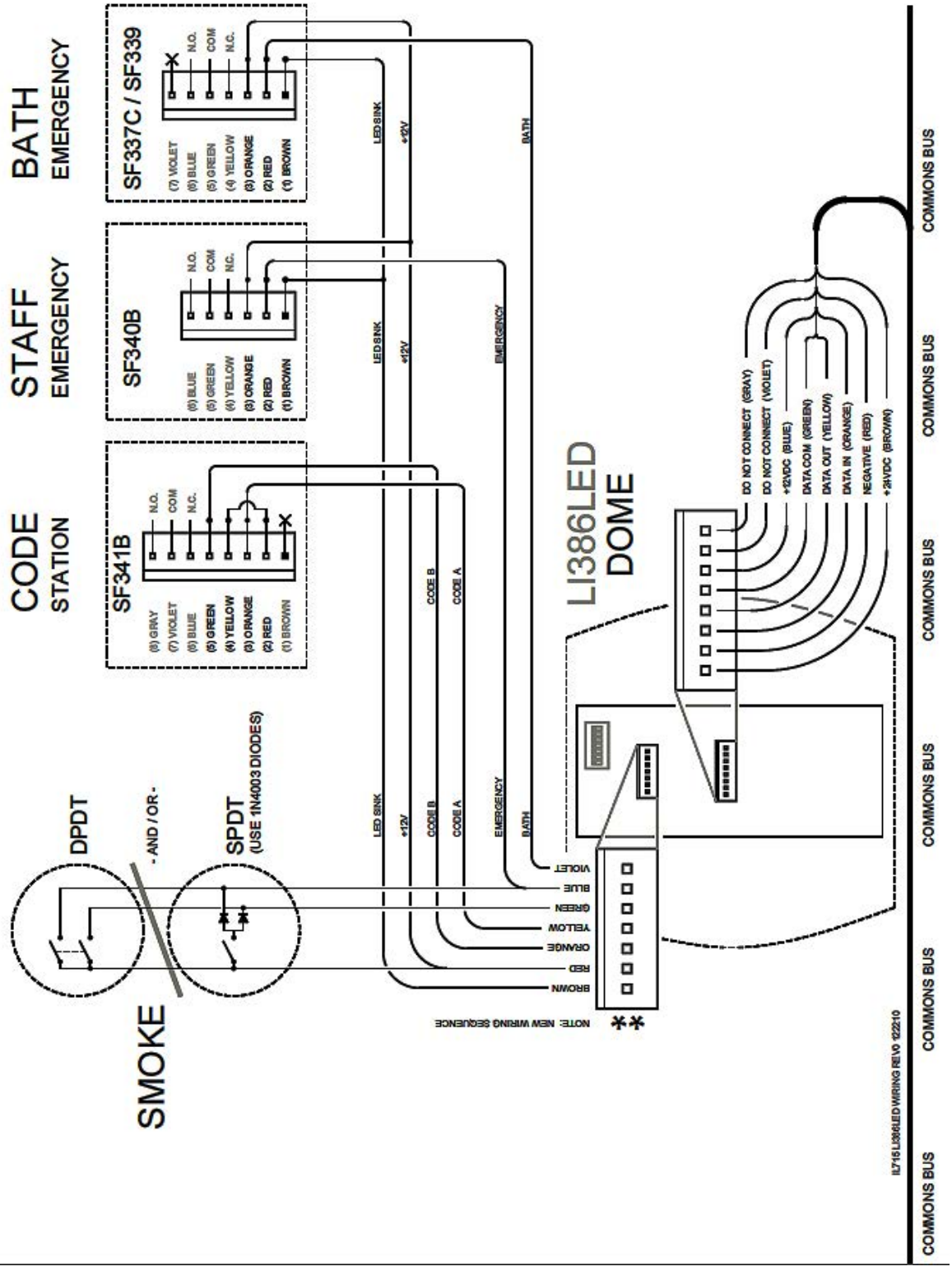


Figure 29 - LI386LED Wiring Diagram



System Operating Instructions

Patient Station Operation

This section refers to the following types of patient stations: IR3xx-series and SF380-series. Refer to **Figure 30 on page 39** and **Figure 31 on page 40** for the locations, names and functions of the controls and indicators of these devices. A brief description of the operating controls for patient stations follows.

Call-Placed Light: The call-placed light indicates when any call is placed from the patient station.

Reset Switch/In-Use Light: The reset button cancels a call placed from the station. The light illuminates whenever communications from the master station is engaged.

Call Cord Receptacle: The round DIN receptacle found on IR319-series and IR320-series stations uses SF401EX strain relief cables, SF4xx-series call cords, and SF4xx-series pillow speakers.

> **NOTE**: There are a number of older call cord receptacle types. Please contact tech support for more details.
>
> **NOTE**: Only call cords and pillow speakers that are tested with and UL approved for use with TekTone nurse call equipment may be directly connected to the DIN call cord receptacle on TekTone patient stations. Other methods are available for properly isolated connections of hospital beds and other ancillary equipment.

Pull Cord: The IR318B provides an integral call-initiating pull cord. Patients simply pull on the cord to trigger a call.

Speaker/Microphone: The speaker/microphone is used for voice communications and tone signaling. Due to the high sensitivity of the speaker/microphone, the patient does not need to move close to the device, or to speak above normal levels to be heard.

To Place a Call:

1. Press the call button on the end of the call cord, or press the red call button with the nurse or cross symbol on the pillow speaker, or pull on the IR318 call cord. (See **Figure 15 and Figure 36 on page 43**.)
2. Call placement can be verified by the flashing of the Call-Placed Light. A “Cord-Out” call will automatically be placed if a call cord or pillow speaker is removed. **NOTE**: SF380 stations must be programmed for Personal Attn. Priority Level.

To Answer a Call:

Reply in a normal voice when spoken to. The audio communication will normally come from the patient station. If IR3xx-series are used with PM311C or PM312C Pillow Speaker Module, audio communications will be to and from the intercom-capable pillow speaker. Calls placed from SF380-series stations must be handled in person, because the SF380 do not incorporate audio communication.

To Cancel a Call:

1. Press the reset button until the call-placed LED is extinguished.
2. Canceling a call placed by the removal of a call cord can be accomplished by replacing the call cord.

Television Controls:

For the IR3xx-series patient stations with pillow speakers, press the button labeled “TV” or with the television symbol. If the television is off, the first press will turn it on. Each successive press will step through the channels until the television turns back off. The volume may be adjusted by rotating the volume control until the desired level is reached. This control only adjusts television audio levels.

NOTE: Connect only UL®1410 approved hospital-grade TVs in this application.

Figure 30 - Patient Stations (part 1 of 2)

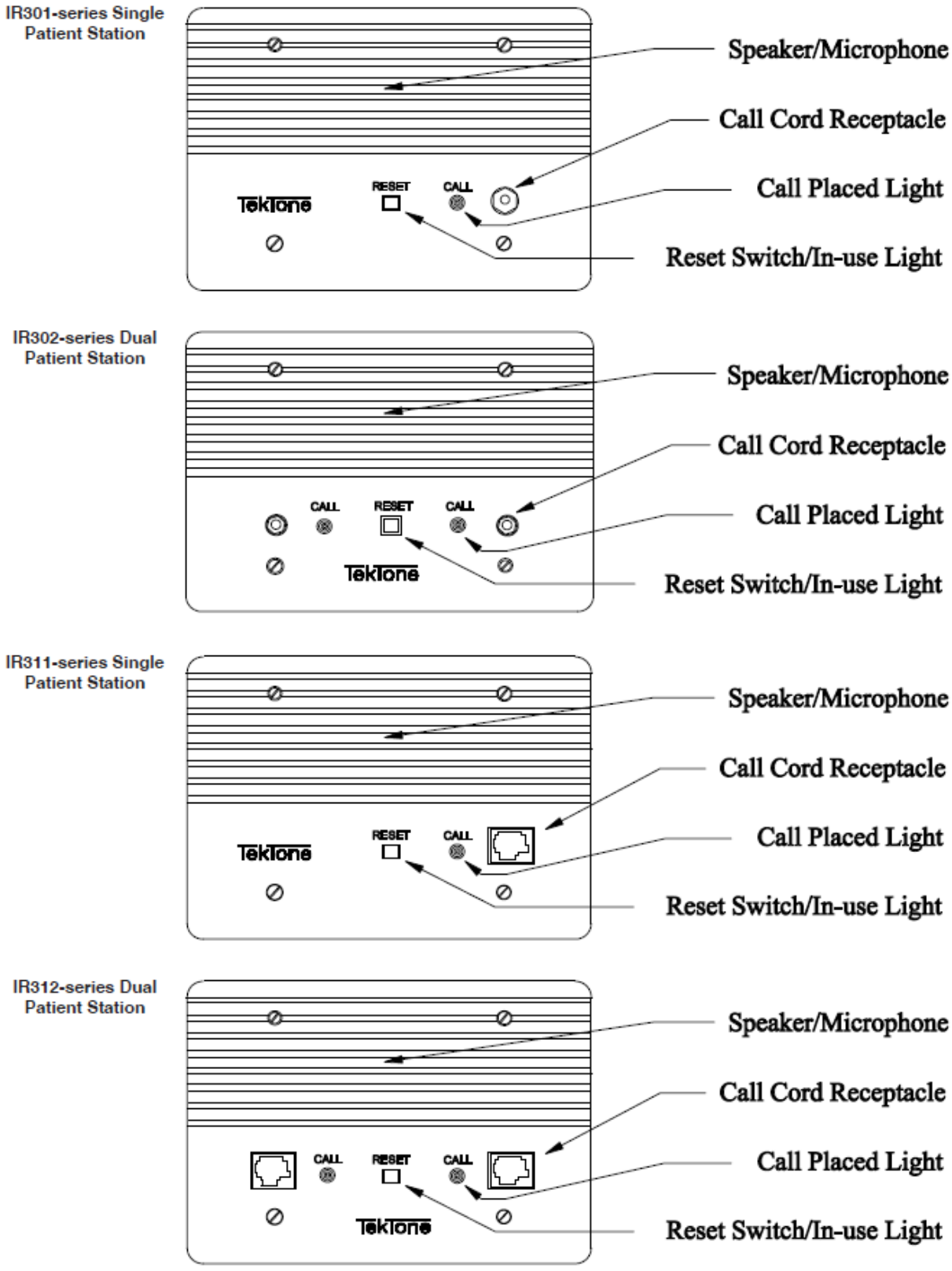


Figure 31 - Patient Stations (part 2 of 2)

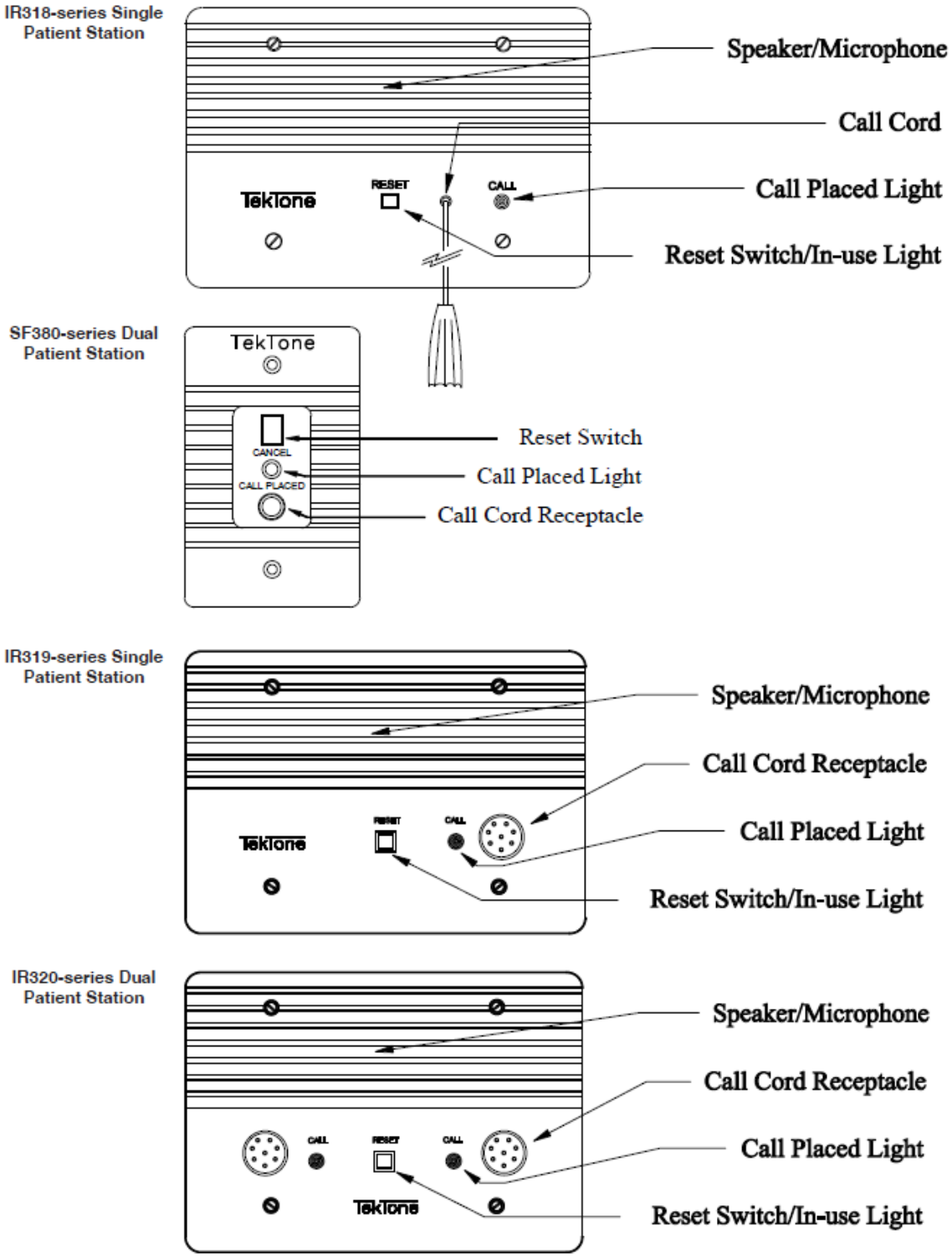
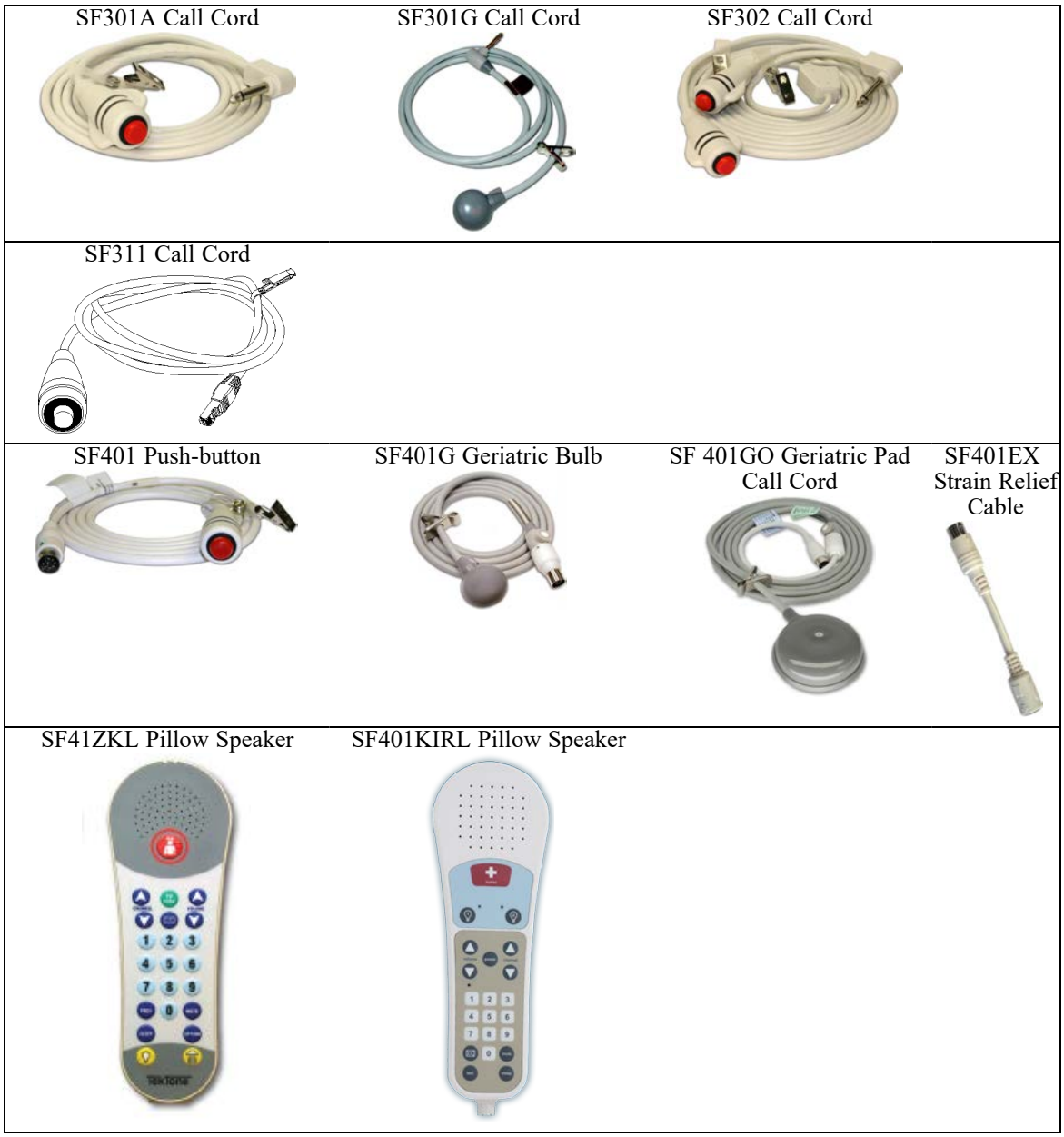


Figure 32 - Call Cords and Pillow Speakers



IR310 Staff and IR315 Duty Station Operation

Call Button/Call-Placed Light: The call button is used to place a call to the master. The call light will flash to indicate that a call has been placed. On the duty station, it also indicates call information from other stations sharing the same zones. See Priority Signals below.

Reset Switch/In-Use Light: The **Reset** button is used to cancel a call placed from the station. The light illuminates whenever communication from the master station is engaged. On the duty station, it also serves as a **Tone-off** button to silence low priority call tone annunciation. Once engaged, the tone will only reactivate after all low priority calls have been cleared. Medium and High priority calls will override this and cannot be silenced.

Emergency Light: This is provided only on the duty station and is used to indicate call information from other stations sharing the same zones.

Priority Signals: The duty station provides an additional annunciation device to the Tek-CARE300III system. It will annunciate call information from other stations that share the same zone(s) by doing the following:

> **Low Priority Calls**: The call-placed light will flash and a tone will be emitted every 8 seconds.
>
> **Medium Priority Calls**: The emergency light and call-placed lights will flash alternately and a repeating tone will be emitted at a half-second rate.
>
> **High Priority Calls / Stat Service Request**: The emergency light and call-placed light will flash alternately at twice the rate of medium priority calls and a fast repeating tone will be emitted at a quarter-second rate.

Speaker/Microphone: The speaker/microphone is used for voice communications and tone signaling. Due to the high sensitivity of the speaker/microphone, it is not necessary to raise the voice above normal speaking levels to be heard.

To Place a Call: Press the **Call** button. The call-placed light will flash.

To Respond to a Call: Reply in a normal voice when spoken to.

To Cancel a Call: Press the **Reset** button until the call-placed LED is extinguished.

To Silence a Low Priority Call Tone: Press the **Reset** button. **NOTE**: If another call is placed, the tone signal will resume until either the reset button is pressed again or the pending calls have been resolved.

NOTE: The IR315 Duty Station does not support locally connected code call devices.

NOTE: The IR310 can be changed to place a routine call to use as a resident speaker station. Turn dipswitch 7 to the ON position.

SF337C Water Resistant Pull/Pull Cord Emergency Switch Operation

Pull-Down/Reset Lever: The pull-down/reset lever is used to place and reset bath priority calls.

Call-Placed Light: The red light flashes to indicate call placement.

To Place a Call: Pull on the red lever, or pull down on the 7′ attached cord (if installed).

To Cancel a Call: Push the red lever to the “up” position. Calls must be reset at the point of origin.

Figure 33 - IR310 Staff Station

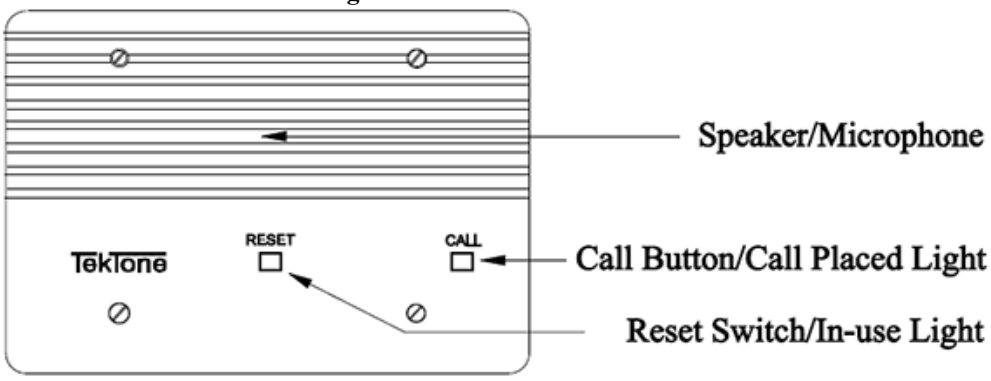


Figure 34 - IR315 Duty Station

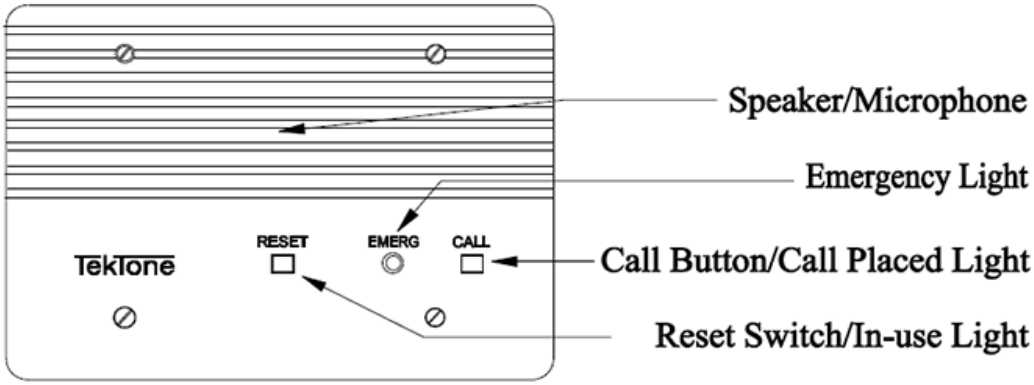


Figure 35 - SF337C, SF340B, SF381 Emergency Switches

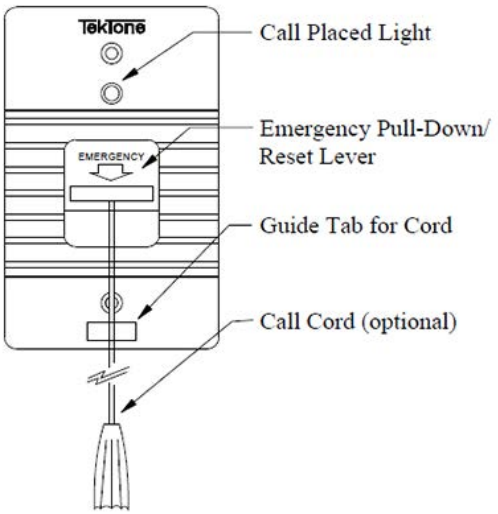
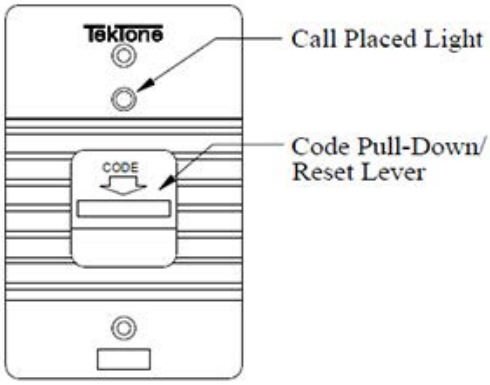


Figure 36 - SF341B and SF382 Code Call Switch



SF340B and SF381 Pull/Pull Cord Emergency Switch Operation

The SF340B and SF381 devices function in the same manner as the SF337C, but are not water resistant.

SF341B and SF382 Code Call Switch Operation

Pull-Down/Reset Lever: The pull-down/reset lever is used to place and reset code priority calls.

Call-Placed Light: The red light flashes to indicate call placement.

To Place a Call: Pull on the blue lever.

To Cancel a Call: Push the blue lever to the “up” position. Calls must be reset at the point of origin.

SF350B Nurse(L1)/Aide(L2) Presence Station Operation

Nurse Registration Button: The nurse registration button (green) is used to initiate and cancel a nurse-present signal to the master station. Upon registration activation, it will also reset any routine, personal attention or priority call made from the associated room.

Nurse Registration Light: The green light will flash to indicate a nurse service request and will light steadily to indicate a nurse-present status. This light will go out when the nurse is no longer registered in the room.

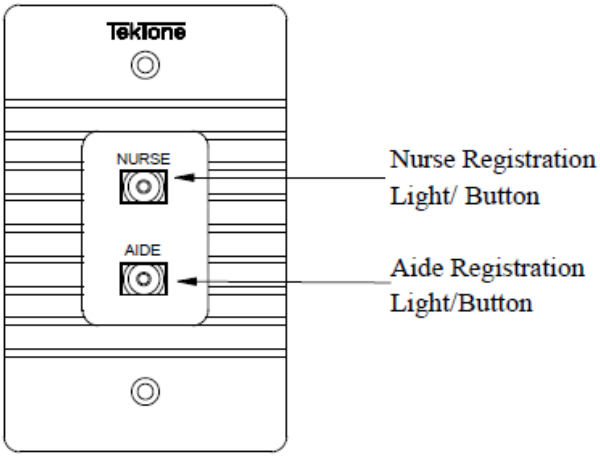
Aide Registration Button: The aide registration button (yellow) is used to initiate and cancel an aide-present signal to the master station. Upon registration activation, it will also reset any routine, personal attention or priority call made from the associated room.

Aide Registration Light: The amber light will flash to indicate an aide service request and will light steadily to indicate an aide-present status. This light will go out when the aide is no longer registered in the room.

To Register Nurse or Aide Presence: Press the green (nurse) or amber (aide) button.

To Cancel Nurse or Aide Presence: Press the green (nurse) or amber (aide) button.

Figure 37 - SF350B Nurse/Aide Presence Station



LI380/LI380LED, LI386 Dome Zone/Light Operation

The LI38x-series dome/zone lamps provide for local or zone indication of call origin, priority and staff presence. Dome lamp applications are local to a specific room and annunciate call information for that room. Zone lamps are representative of a group (or zone) of stations and will annunciate the highest priority call from that group. These devices may serve for dome or zone operation (depending on the station they are connected to). The LI386 is a stand-alone device that is not used with other stations and is typically used for zone applications. It can, however, support bath and code inputs for local annunciation. The LI386 is addressed in the same manner as patient and staff stations, and supports no voice communication functions.

Lamp (Default) Indications:

High Priority (fast repeating flash):

Code Call	Alternate flashing red and white
Fire	Flashing red (supplementary signal only)
Emergency	Flashing White
Stat Service Request	Alternate flashing green and yellow

Medium Priority (slow repeating flash):

Monitor	Flashing red
Bath	Flashing white
Bed Out	Flashing white
Cord Out	Flashing white
Priority	Flashing white
Nurse Service Request	Flashing green
Aid Service Request	Flashing yellow

Low Priority (steady lamp):

Staff	Steady white
Duty	Steady white
Personal Attention	Steady white
Routine	Steady white
Nurse Present	Steady green
Aide Present	Steady yellow

System Status:

Comm. Fault	No dome light indication
Code Fault	No dome light indication
Lamp Fault	No dome light indication

System Test Instructions

This section provides guidelines for testing the Tek-CARE300III system. As mentioned previously, we recommend that the installer connect and test the system in sections, to allow for easier identification of problem locations. Before testing a system, perform a complete walk through of the facility, and be certain to:

- verify that all components of the system to be tested are completely installed.
- verify that all patient stations that require them have call cords attached.
- verify that all pull cord or hand pull stations are in the reset position.

Using the **System Operating Instructions on page 38** for reference, activate and observe the system operation for every component connected to the system. While initial testing must be performed in sections, a complete system test must be performed once all components are connected to the system. This entails activating every system component and verifying its operation a final time before considering the installation complete.

We recommend that the system be periodically tested as indicated in this chapter to verify that the system is in good operating condition. If problems are encountered, contact qualified service personnel for system repair or maintenance. The next chapter, **System Maintenance Instructions on page 47**, indicates which items may be serviced by on-site maintenance personnel.

System Maintenance Instructions

IR3xx-series Patient Station: Call cords may be replaced if a problem is encountered. To do so perform the following steps:

1. To remove the call cord, firmly grip the plug and pull straight away from the patient station.
2. To insert the new call cord, hold the plug and push the end straight into the call cord jack on the patient station.
3. Test the cord by pressing the button on the other end. This should initiate a call and light the call indicator. Press the **Reset** button on the patient station to reset the call. Observe the station for 10 seconds to ensure that no “cord-out” call occurs.

IR311 or IR312 Patient Station: Call cords and/or pillow speakers may be replaced if a problem is encountered. To do so perform the following steps:

1. To remove the call cord or pillow speaker, firmly grip the plug and depress the locking tab. Pull straight away from the patient station.
2. To insert the new call cord or pillow speaker, hold the plug and push the end straight onto the call cord jack on the patient station.
3. Test the call cord or pillow speaker, respectively, by depressing the button on the other end or the red nurse call button. This should initiate a call and light the call indicator. Press the **Reset** button on the patient station to reset the call. Observe the station for 10 seconds to ensure that a “cord-out” call does not occur.

LI380, LI384A and LI386 Dome/Zone Lights: Lamp bulbs must be replaced if they no longer light. To do so, perform the following steps:

1. Remove the light cover lens by gripping it firmly, squeezing the sides and pulling it straight off the base plate.
2. Remove the bulb by grasping the glass portion gently, so as not to break it. Push inward, rotate it counterclockwise, and pull it straight away from the metal socket.
3. If a color bulb cover is used, remove and transfer it to the new bulb.
4. Hold the new bulb by the glass portion gently, so as not to break it. Push it straight into the new socket and rotate it clockwise.
5. Replace the cover lens.
6. Test the lamps by triggering the appropriate call to illuminate the new bulb (refer to the **System Operating Instructions on page 38** for details).

LI38xLED-series dome and zone lights use LEDs instead of incandescent lamps and therefore are not replaceable. If one LED fails, replace the entire unit or return for repair.

Replacement Part Numbers:

Part #	Description	Used by
CA043	Handset Cord	NC305LCD Master Station
CA025	Handset Cord	NC415G3 and NC404TS Master Station
LI028	Bulb	LI380, LI381, LI382
SF302	Dual Call Cord - 7'	IR301-series, IR302-series Stations
SF302/10	Dual Call Cord - 10'	IR301-series, IR302-series Stations
SF311	Call Cord - 7'	IR311-series, IR312-series Stations
SF311/10	Call Cord - 10'	IR311-series, IR312-series Stations
SF401A	Call Cord - 7'	IR319-series, IR320-series Stations
SF401G	Geriatric Bulb Call Cord - 6'	IR319-series, IR320-series Stations
SF401GP	Geriatric Pad Call Cord - 8'	IR319-series, IR320-series Stations
SF401KIRL	Pillow Speaker	IR319-series, IR320-series Stations
SF41ZKL	Pillow Speaker	IR319-series, IR320-series Stations

System Troubleshooting Guide

This section provides guidelines for troubleshooting the Tek-CARE300III system. It covers general troubleshooting practices, as well as specific suggestions for various problems.

As mentioned in **System Installation on page 6**, there are some general troubleshooting techniques that installation personnel must follow during the installation of the system equipment.

> **NOTE**: Installers must always exercise care when troubleshooting problems that might involve high current or high voltage damage. Installers must also exercise extreme caution and be aware of equipment or wiring that uses or handles high voltage, as these sources are potentially lethal.

Do not connect the entire system together for the initial power up. Connect only the central equipment and the first master station/VGA monitor for testing. Then connect the remaining master stations/VGA monitors one at a time until all are connected and functional. This allows the installer to establish a “known good” test point to work from, and to immediately identify problems as they are introduced to the system.

Do not connect all patient station runs to the central equipment at one time. Connect individual runs to the central equipment one by one until all are connected and functional. This allows the installer to more easily locate and recognize the introduction of wiring or equipment problems in the field.

Direct Connection is a classic troubleshooting technique. If a problem is encountered, an installer may directly connect a master station or a patient station to the central equipment. If the problem ceases, then the source of trouble is located in the field (i.e., wiring or mounting related problems), whereas if the problem remains, it is equipment based. This can also be applied to patient station peripheral devices, which can be directly connected at the patient station location. While this is not an absolute test, it can provide a strong indication of where to look when troubleshooting.

Swap Testing is another well-known method of problem identification. If a problem is identified, an installer can interchange a known good piece of equipment into the location in question and move the device having problems to the location that the known good device previously occupied.

> **WARNING: If a device or wiring indicates high current or high voltage damage, this technique must be delayed until the source of the original problem is located. When swap testing is performed, the system must be powered down during the actual swapping process or damage may result. “Hot swapping” is highly discouraged.**

As an example, a patient station in one room that demonstrates a problem can be “swapped” with a station from another room that is known to be working acceptably. If the symptom follows the original problem device, the problem is equipment based. If the problem remains in the original location, a field problem is indicated (i.e., wiring or mounting related problems). This technique can be applied to master stations, master station control equipment, central equipment ports, etc.

> **NOTE**: If swap testing, the station addresses must be updated to the address of the current location to match what the software configuration will be looking for. Then return the address to the original when placing the station back to its original location.

Voltage Readings

The following readings can be taken using a standard voltage meter. All readings are taken using the system ground as a reference.

> **NOTE**: All readings below are approximations and must be used only as rough guidelines. This is due to the variables created by each job site, such as wire lengths, number of stations, etc.

Common Connectors:

Wire Color	Description	Voltage Reading
Gray	Audio-	Levels on this line can vary, but must not be a constant +12 or +24 VDC.
Violet	Audio+	Levels on this line can vary, but must not be a constant +12 or +24 VDC.
Blue	+12 VDC	+11 to 12 VDC.
Green	Data Common	0 VDC.
Yellow	Data Out	See information below.
Orange	Data In	See information below.
Red	Negative	0 VDC.
Brown	+24VDC	+24 VDC.

Peripheral Connector:

Wire Color	Description	Voltage Reading/Test Suggestion
Yellow/White	Aide Input	0 VDC / Momentary application of +12 VDC will toggle call status.
Green/White	Nurse Input	0 VDC / Momentary application of +12 VDC will toggle call status.
Orange/White	Bath Input	0 VDC / Momentary application of +12 VDC will toggle call status.
Red/White	Emergency Input	0 VDC / Momentary application of +12 VDC will toggle call status.
Brown/White	Monitor Input	0 VDC / Momentary application of +12 VDC will initiate a Monitor call that is reset by pressing the reset button on the station. NOTE: A fire call can be triggered by applying a constant +12 VDC to both Red/White and Brown / White at the same time.
Black	Code A	Call active: +9 to 10 VDC. Call inactive: +12 VDC. This input works in conjunction with Code B. When this input is active, a trickle current runs constantly through the wires and code station with an approximate load of 47,000 ohms. Shorting these lines together will trigger a code call manually.
White	Code B	Call active: +7 to 8 VDC. Call inactive: +1 to 2 VDC. / See Black (Code A) information.
Gray	Negative	0 VDC.
Violet	+12 VDC	+11 to 12 VDC.
Blue	Lamp Fault	This input must receive a constant +24 VDC input, or a lamp fault will be triggered.
Green	Red Dome Output	+24 VDC w/ lamp off, 0 to +1 VDC when lamp is on.
Yellow	Green Dome Output	+24 VDC w/ lamp off, 0 to +1 VDC when lamp is on.
Orange	Yellow Dome Output	+24 VDC w/ lamp off, 0 to +1 VDC when lamp is on.

Red	White Dome Output	+24 VDC w/ lamp off, 0 to +1 VDC when lamp is on.
Brown	Peripheral LED Output	+1 to 2 VDC when no calls are active. A constant pulsing to +12 VDC when a bath or emergency call is placed.

Standalone Bath and Code Station Connections:

Common Connector:

Wire Color	Description	Voltage Reading
Gray	Red Dome Output	+24 VDC when lamp is off; 0 to +1 when lamp is on.
Violet	White Dome Output	+24 VDC when lamp is off; 0 to +1 when lamp is on.
Blue	+12 VDC	+11 to 12 VDC.
Green	Data Common	0 VDC.
Yellow	Data Out	+8 to 11 VDC.
Orange	Data In	+4 to 6 VDC.
Red	Negative	0 VDC.
Brown	+24 VDC	+24 VDC.

Symptoms and Suggestions

Code Fault Indication (SF341B)

- Confirm that the station actually has a code device connected to it.
- If a code station is present, then verify the trickle current loop path. Disconnect the Code A and Code B lines from the peripheral connector on the back of the patient station. Using an ohmmeter, read across the two lines for the loop resistance (approximately 47,000 ohms). Wiring continuity must also be verified.
- The code station and associated patient station can be swap tested with other “known-good” devices.

Comm. Fault Indication (patient station fault)

- Determine if the comm. fault is singular or a large group of patient stations.
- If the fault is coming from a single station, check the voltage at that station. If the faults are coming from a large group of patient stations, check the voltage at the NC356CE.
- If the faults are a large group, then the associated common wiring to that section of rooms must be examined for opens, shorts and grounds. The actual architectural room numbers can assist in the physical location. If the faults represent all of the stations on the patient station port, then the port may no longer be working. Swap testing between ports can be performed. The installer will need to perform the Detect System Stations command from the System Functions menu. Once the problem has been identified, corrected, and the ports returned to their original configuration, the Detect System Stations command will need to be executed again.
- If the fault is a single device, verify the local room wiring (connections and plugin connector) for continuity, opens, shorts and grounds. The patient station may also be swap tested with another “known-good” device for verification.

Data or Polling Noise

Verify that common cable shield drain wires have been kept isolated and fed through at splice points. At the end of a cable run, the shields must be isolated and taped back. Noise transference is a cumulative effect and is worsened for each error in connection. **NOTE**: The included connection harness ("pigtail" or "whip" connector) brings the shields together prior to entering the central equipment chassis. Thus, if an ohmmeter is used to check for continuity between shields, the connection harness must be removed from field wire prior to taking the reading.

IR3xx-series Patient Station is not placing calls

- Swap test the associated call cord.
- Swap test the patient station with another "known-good" patient station.
- If the problem encompasses an entire port, see Comm. Fault Indication (patient station fault) earlier in this chapter for port swapping information.

IR3xx-series Patient Station has a constant "Cord Out" message

- Verify that the call cord is properly inserted.
- Swap test the call cord with another "known-good" call cord.
- Swap test the patient station with another "known-good" patient station.

IR310 Staff Station is placing "Routine Calls"

The IR310 station has a special "routine call" feature that is triggered by turning on dip switch 7. If this feature is not desired, the dip switch must be turned off. **NOTE**: This will effectively change the station's type (triggering a station type fault), so the Detect System Stations command must be run from the System Functions menu to complete the change process.

IR315 Duty Station or LI386 Dome/Zone Lamp is not annunciating calls. This is a software-controlled feature. The duty station or dome zone lamp should have the zones assigned that are to be annunciated by the device.

Lamp Fault Indication

- Determine the type of lamp being used with the station reporting the lamp fault (supervised or unsupervised).
- If the lamp is supervised, check the four bulbs for open filaments. This can also be verified by swap testing the bulbs with "known-good" bulbs. If all four bulbs are intact, verify the connection to the Lamp Fault Input (blue wire on the 15-pin peripheral connector on the associated patient station). During normal operation, the supervised dome lamp provides a steady +24 VDC input to prevent the lamp fault from being triggered. This ceases when a filament opens.
- If the lamp is unsupervised, check the connection from the Lamp Fault Input to the +24 VDC common wire. If this connection is present, verify its continuity. If the voltage is present, swap test the patient station with a "known-good" device.

LI380-series Lamp is not lighting

- For non-LED version lights, verify that the bulb filaments are not broken or open. This can also be verified by swap testing the bulb in question with a "known-good" lamp bulb.
- If the bulbs are functional, verify the connections to the patient station. The dome lamp may also be tested by directly connecting it to the patient station peripheral connector.
- The patient station may also be swap tested. Observe station circuit board for signs of high current damage.

LI38xLED-series dome and zone lights use LEDs instead of incandescent lamps and therefore are not replaceable. If one LED fails, replace the entire unit or return for repair.

SF381 Standalone Bath Station or SF382 Standalone Code Station is not placing calls

These devices look like peripheral devices, but they function electronically just like IR3xx-series Patient Stations. They interact directly with the central equipment, rather than through an IR3xx-series Patient Station. Therefore, refer to these troubleshooting sections:

- Comm. Fault Indication (patient station fault)
- IR3xx-series Patient Station is not placing calls
- IR3xx-series Patient Station that has been installed is not recognized by the system

SF350B Nurse/Aide Presence Station is not registering or is not working correctly

- If the device is operating, but the LEDs are not lighting, check to see if the green or yellow dome lamps are working. If both are out, swap test the patient station and examine the peripheral connector's continuity.
- If only the lights are not working and the dome outputs are working, verify that there is roughly +12 VDC across the orange and yellow wires at the SF350B device's location. Verify the continuity of the red and green wires back to the peripheral connector on the patient station.
- If the device is not operating, the inputs on the patient station can be manually triggered by the application of the +12 VDC line (refer to **Voltage Readings on page 50** for more details). The device can be directly connected for testing, and may also be swap tested with another "known-good" device for verification.

SF337C or SF340B Bath Stations not placing calls

- Swap test the device with another "known-good" device. If the device works correctly in another location, examine the interconnection wiring. If it does not work, the device is suspected bad and must be replaced or repaired.
- To verify the device, review these 3 connections: brown wire—LED drive from the patient station, red wire—signal line to the patient station's Bath Input, and orange wire—+12 VDC in from the patient station. When the device is operated, the +12 VDC from the orange wire is connected to the red wire to trigger the Bath Input on the patient station. This in turn activates the LED output on the patient station, which applies ground to the LED circuit, causing it to light via the brown wire.
- If the bath station and wiring appear to be correct, then the patient station can also be swap tested with another "known-good" patient station.

Tek-CARE300III Programming Worksheets

Module Address (1-75)	Port (0 or 1)	Station DIP Switch Address (0-31)	Custom Station Name	Station Type	Station Behavior	Paging (Y/N)	Privacy (Y/N)	Attached Peripherals (Y/N)	Zones
1	0	0	Room 100	IR312	Escalate	Y	N	Y	Z01, Z05

Module Address (1-75)	Port (0 or 1)	Station DIP Switch Address (0-31)	Custom Station Name	Station Type	Station Behavior	Paging (Y/N)	Privacy (Y/N)	Attached Peripherals (Y/N)	Zones
1	0	0	Room 100	IR312	Escalate	Y	N	Y	Z01, Z05

Module Address (1-75)	Port (0 or 1)	Station DIP Switch Address (0-31)	Custom Station Name	Station Type	Station Behavior	Paging (Y/N)	Privacy (Y/N)	Attached Peripherals (Y/N)	Zones
1	0	0	Room 100	IR312	Escalate	Y	N	Y	Z01, Z05

Module Address (1-75)	Port (0 or 1)	Station DIP Switch Address (0-31)	Custom Station Name	Station Type	Station Behavior	Paging (Y/N)	Privacy (Y/N)	Attached Peripherals (Y/N)	Zones
1	0	0	Room 100	IR312	Escalate	Y	N	Y	Z01, Z05