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Tek-CARE160

Audio-Visual Nurse Call Signaling System

Installation and Operation Manual

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Tek-CARE160 Installation Manual

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Introduction and Overview

Introduction

Welcome to the installation manual for the Tek-CARE160 Nurse Call System. This system is designed to be low cost, easy to install, and extremely reliable. This manual will walk you through the installation and configuration process, and will cover system operation as well as common troubleshooting steps.

If you have 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.

Overview

The Tek-CARE160 system is a versatile system that can satisfy the needs of a wide range of facilities. At its core, the Tek-CARE160 system is a four-wire nurse call system designed for easy installation and years of trouble-free operation. The system is available with a variety of call stations such as two-button pull-cord stations, 1/4" jack call cord stations, duty stations, dome lights, and more.

In addition to these items, the Tek-CARE160 system can be easily integrated with existing TekTone nurse call systems, nurse call systems manufactured by other companies, as well as a wide variety of building systems such as fire alarm systems, security and access control systems, and much more.

The Tek-CARE160 system may be used as either a standalone nurse call system using NC415AV/NC404TS Master Stations, or it may be connected to another TekTone nurse call system, such as the Tek-CARE400 or Tek-CARE400P5/Tek-CARE400P5+ over the Tek-CARE Network. With the addition of the LS601 Tek-ALERT Integration Manager, the Tek-CARE160 system is capable of communicating with many other types of building systems, such as fire alarm and security systems. The LS601 Tek-ALERT Integration Manager also allows the system to display and log various events from older analog TekTone nurse call systems such as the Tek-CARE NC110, NC150, NC200, and 300/III systems.

Product Overview

NC160 Central Equipment Module: The Tek-CARE160 system's main component is the NC160 Central Equipment (CE) Module. The CE module is designed to be stackable or rack mountable. The NC160 CE Module can operate as a standalone system, or as a module on a larger, integrated Tek-CARE nurse call system. The NC160 CE Module provides connections for 64 room controllers, and six NC415AV or ten NC404TS Master Stations. Multiple CE modules may be networked together to create a larger system.

NC415AV Master Station: The NC415AV Master Station is a touchscreen master station that is used to interact with the Tek-CARE160 system. The NC415AV Master Station displays calls from the Tek-CARE160 system and provides limited programming and configuration ability for the Tek-CARE160 system. The NC415AV uses a five-inch LCD touchscreen to provide audible and visual annunciation of system calls. The NC415AV may be mounted using the IH415D desk stand or wall-mounted using the IH415W wall-mount bracket.

NC404TS Master Station: The NC404TS Master Station is a touchscreen master station that is used to interact with the Tek-CARE160 system. The NC404TS Master Station can display maps and calls from the Tek-CARE160 system and provides programming and configuration ability for the Tek-CARE160 system. The NC404TS uses a 22-inch LCD touchscreen to provide audible and visual annunciation of system calls. The NC404TS may be mounted using the CL231 bracket.

LI122UN Room Controller: The LI122UN Room Controller provides connections for six Tek-CARE160 stations and one connection for the Tek-CARE160 data bus. In most instances, the room controller is installed outside a room in the same position as a traditional dome light. The two-conductor cable is used to connect Tek-CARE160 stations to the LI122UN Room Controllers. The rear of the room controller contains a 14-pin header. Pins 1-12 are used in pairs for station connections, and pins 13 and 14 are used to connect the room controller to the Tek-CARE160 data bus. The LI122UN annunciates high priority calls with red or blue LEDs and low priority calls with white LEDs. The LED colors can be changed on the room controller.

PM120 Room Controller: The PM120 Room Controller provides connection points for Tek-CARE160 stations without the dome light LEDs found on the LI122UN Room Controllers. The PM120 is designed to be installed out of sight.

IR160 Audio Station: The IR160 Audio Station provides a speaker and microphone for two-way communication between facility staff and residents. The IR160 requires a connection to the LI122UN Room Controller (using one point) and a connection to the Tek-CARE160 Audio Bus cable. The IR160 Audio Station can be installed as a standalone speaker, but is most commonly installed with an SF121 or an SF123 series station in an IH122K dual house gang housing. The IR160 shown to the left is shown with a SF121 Patient Station.

SF121 and SF122 Patient Stations: The SF121 Patient Station is designed to provide a single 1/4" jack for standard call cords. The SF121 mounts near a resident's bed or chair, and enables calls to be placed using pushbutton call cords, geriatric call cords, pneumatic call cords, and more. The SF121 is equipped with an illuminated reset button. The SF122 Patient Station is a dual-jack version of the SF121.

SF123 2-Button Pull-Cord Station: The SF123 station is used to place a variety of calls on the Tek-CARE160 system. The SF123 uses interchangeable inserts depending on the desired function of the station. The SF123 is most commonly used as an Emergency station, but can be easily configured for Bath, Code Blue, and Emergency 2 calls. Custom call types may also be created, and custom call type inserts can be generated using the LS450 Config Tool software. The SF123 can also be used as a room-level reset button and a check-in station. Use the RP187K Gasket Kit for mounting in wet environments.

SF125 Duty Station: The SF125 is a duty station used to alert staff to pending Tek-CARE160 system calls. The duty station is installed in areas where call annunciation is needed, but the full functionality of a master station is not. Four LEDs communicate the type of active call, and an audible tone alerts staff members when calls are placed. The SF125 duty station uses two points on the LI122UN Room Controller or PM120 Room Controller.

PM123 Auxiliary Input Module: The PM123 is a module used to monitor normally open dry contacts such as door switches, emergency pushbuttons, and alarm contact outputs. The PM123 is designed to be installed out of sight. Up to two individual contacts can be monitored with a single PM123. The PM123 may also be used as an auxiliary check-in device. Normally open contacts such as door switches, motion detectors, or pressure pads may be used with the PM123 to satisfy a resident check-in requirement on the system.

CT160 Cable Adapter (CT160K pictured - CT160 with housing): The CT160 is designed to adapt a connection from a two-wire flying lead to an 8P8C connector. The CT160 may be connected to LI122UN and PM120 Room Controllers or can be ordered as the CT160K which includes housing.

Installation

Installation for the Tek-CARE160 system is designed to be very straightforward. The audio bus is designed to operate on unshielded 18/2 AWG twisted cable or on CAT5 or better cabling.

When making wiring connections, use quality crimp connectors such as Dolphin® Super B® connectors. Do not use wire nuts. Adequately protect all splices using junction boxes.

Installation Workflow:

- Install all NC160 CE Modules.
- Install the backup batteries.
- Run data and audio bus wiring through the facility.
- Install and address LI122UN/PM120 Room Controllers.
- Connect the audio bus to IR160 stations.
- Run master bus wiring and make 8P8C terminations.
- Check data bus for shorts and connect master and data bus wiring to the NC160 CE Module.
- Power on the NC160 CE Module.
- Create a configuration using the LS450 Config Tool software.
- Test the Tek-CARE160 system.
- Back up the configuration and turn the system over to the facility.

Types of Installation

There are two types of installations available for the Tek-CARE160 system, a **One-to-One** installation and a **Custom** installation.

One-to-One

A one-to-one installation strategy involves installing a single LI122UN Room Controller outside of each room in the facility and using the points on that room controller to connect to stations installed in that room.

In this installation strategy, stations are normally wired to their default points on the room controller. The room controller will then annunciate calls from its attached stations only.

Custom

In a custom installation, each point on a room controller can be reassigned to a unique Station ID. This enables the room controller to drive stations installed in different rooms. A custom installation strategy also enables a single room controller to drive multiple patient stations in a single area, such as a ward.

> ***Note:*** Custom installations require training and a Config Tool Plus or Config Tool Elite license.

Installation Concerns

When installing the Tek-CARE160 system, organization is key. As you install the system, note the DIP switch address of each room controller, the physical location of the room controller, and which stations are connected to the room controller on each point.

Keeping detailed records throughout the installation process will greatly simplify system programming and setup. A programming worksheet is included at the end of this manual.

Below is an example of a completed programming worksheet.

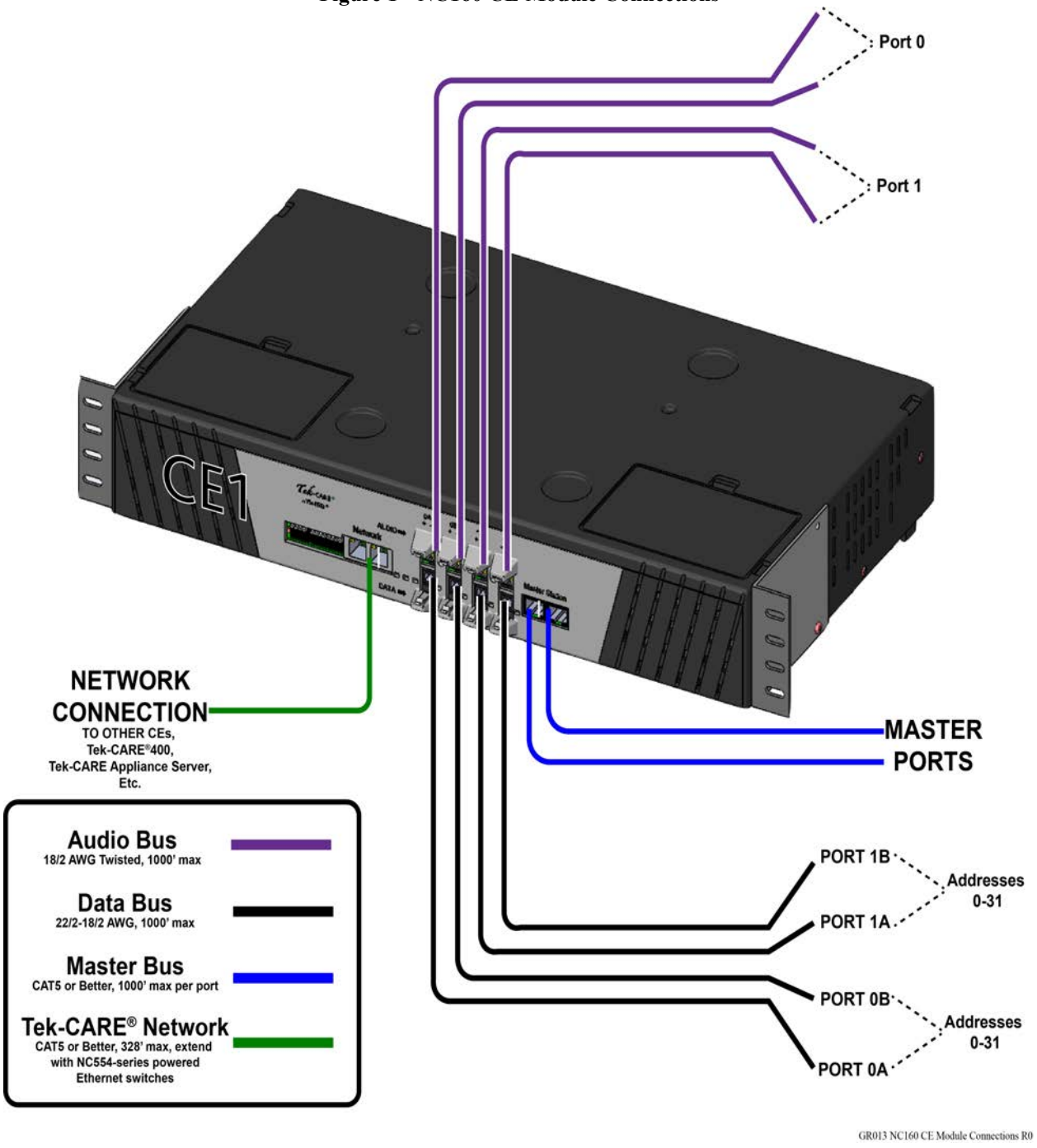
DIP Switch Address		0		
Module Address		1		
Port		0		
Point	**Default Station ID**	**Custom Station ID**	**Hardware**	**Function**
1	0100	Rm 100	SF122	Side A Call
2	0100	Rm 100	SF123	Code Blue
3	0100	Rm 100	SF123	Bath
4	0100	Rm 100	-	-
5	0100	Rm 100	-	-
6	0100	Rm 100	IR160	Audio Spkr 1
Red or Blue LED	0100	Rm 100	Red -or- Blue	Standard -or- Zone
White LED	0100	Rm 100	White	Standard -or- Zone

Power Considerations

In order to stay within the power limits of the NC160 CE Module and ensure reliable system performance, the Tek-CARE160 Power Calculator will calculate the master load for the module. The calculate may be downloaded at:

http://www.tektone.com/pdf_files/gen2_master_station_load_value_calculator.xlsx

Figure 1 - NC160 CE Module Connections



The NC160 Central Equipment Module

The NC160 Central Equipment Module contains all the necessary connections for the Tek-CARE160 hardware as well as the backup batteries for the system. The NC160 CE Module is designed to be mounted in a standard 19" server rack using included CL120RM brackets. Modules may also be desk-mounted and stacked. The NC160 CE Module requires 160VAC or 240VAC power, and must be connected to a generator-backed circuit intended for life safety equipment.

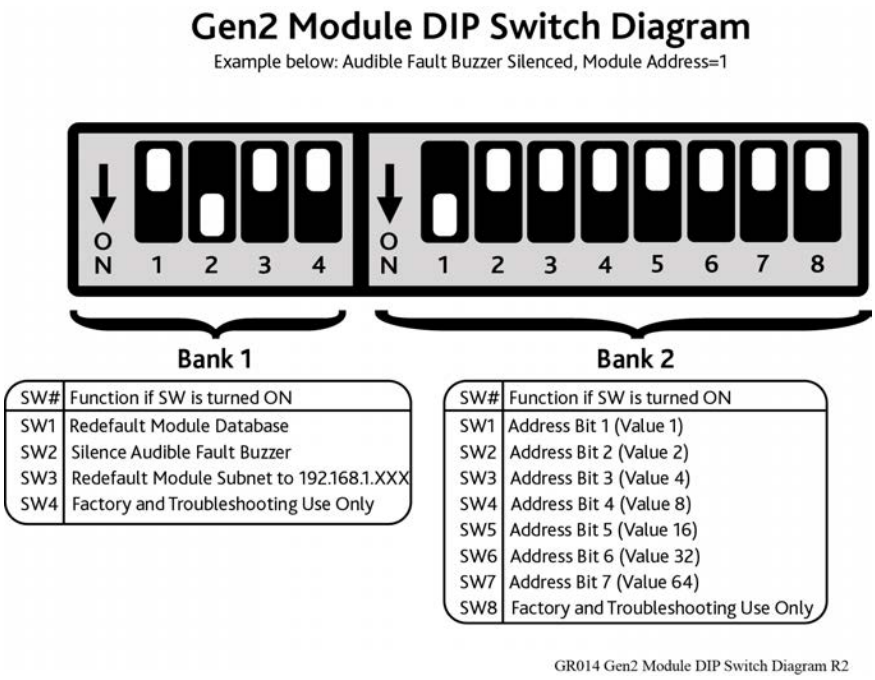
If the NC160 CE Module is not mounted in a server rack, allow adequate air space around the front, sides, and back of the unit. At least 6" of airspace must be maintained for the unit to operate reliably. Refer to **Figure 1 on page 9** for NC160 CE port descriptions.

On the front of the NC160 CE 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 CE module.

The two-position DIP switch indicated by the STA/LOC is for future use, and both dip switches should be turned OFF. If either switch is turned on when the module boots up, the NC160 will return an LED error code 30 (PORT_MODE_NOT_SUPPORTED). The yellow and red LEDs will be lit, and the green LED will flash a two-digit code.

The small bank of 4 DIP switches on the left is used for the following functions. Note that the down position of the switch is on. Normal settings are indicated in parenthesis.

Figure 2 - Module DIP Switch Addressing



Switch 1 – Redefault the database. (Off/Up)

Switch 2 – Silence the audio alarm buzzer. (On/Down)

Switch 3 – Redefault network subnet assignment to 192.168.1. (Off/Up)

Switch 4 – Factory and troubleshooting use only. (Off/Up)

The second bank of 8 DIP switches is used to set the address of the NC160 CE Module.

Switch 1 – Switch 7 – Used to select the CE module's address. Valid addresses are 1-75. Note that though there are 75 available DIP switch addresses, no more than 20 modules may be installed on a single Tek-CARE system. Switch 1- Switch 7 utilize standard binary addressing, with Switch 1 being 1 and Switch 7 being 64.

Switch 8 – Factory Use Only. (Leave turned Off/Up)

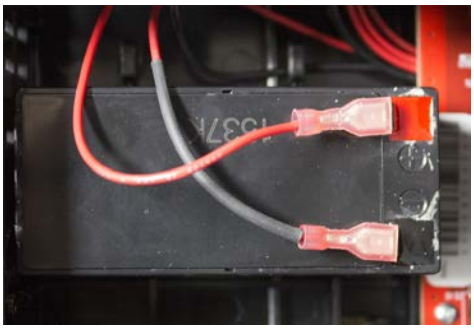
Install Backup Batteries

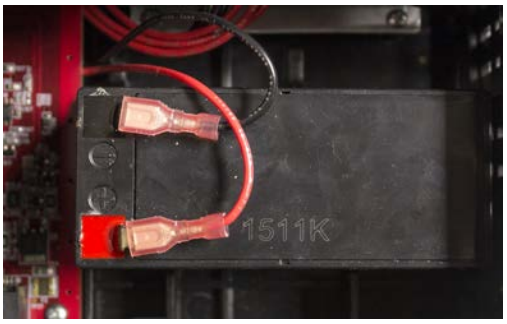
Before proceeding with system setup, install the backup batteries in the module. Open the two-battery compartment covers on the top of the module.

Locate the red (positive) and black (negative) wires with female spade connectors under each door. Move the wires out of the way and place the batteries in the holders and connect the spade terminals to the batteries as shown below.

Connect the red leads to the positive terminal of each battery and the black leads to the negative terminal of each battery.

Figure 3 - Battery Connections





The Tek-CARE160 Data Bus

The Tek-CARE160 data bus is a two-wire serial communications bus. There are four ports on the front of the module, each capable of driving up to 1,000 feet of data bus and up to 16 LI122UN Room Controllers.

There are four 8P8C jacks on the front of the module. The two on the right are for NC415AV/NC404TS Master Stations, and two on the left for Tek-CARE Network connectivity. Each module supports up to six master stations, three per port.

To begin installing the NC160 CE Module, mount the module either on a server rack or on a shelf. Plug in the supplied AC power cord, and turn the unit on. You are now ready to begin connecting field wiring to the module.

Tek-CARE160 Installation Considerations

Note that the audio bus on the Tek-CARE160 system is analog, and thus, only supports one concurrent audio connection per port.

For example, if a facility has IR160 stations in rooms 100-110 connected to Port 0 and rooms 111-160 connected to port 1, one NC415AV/NC404TS Master Station could connect audio to Room 100 and another NC415AV/NC404TS Master Station could connect audio to room 111. If a master station attempts to connect to an audio bus that is already in use, the connection will fail.

When installing cabling, be sure to keep the audio bus and the data bus for each port together. Remember that the IR160 requires a connection to the room controller and the audio bus. If the IR160 is connected to a room controller that uses Data Bus Port 0, but the audio bus for that IR160 connects to Port 1, the audio connection will not function.

Figure 4 - Audio Bus and Controller Connections

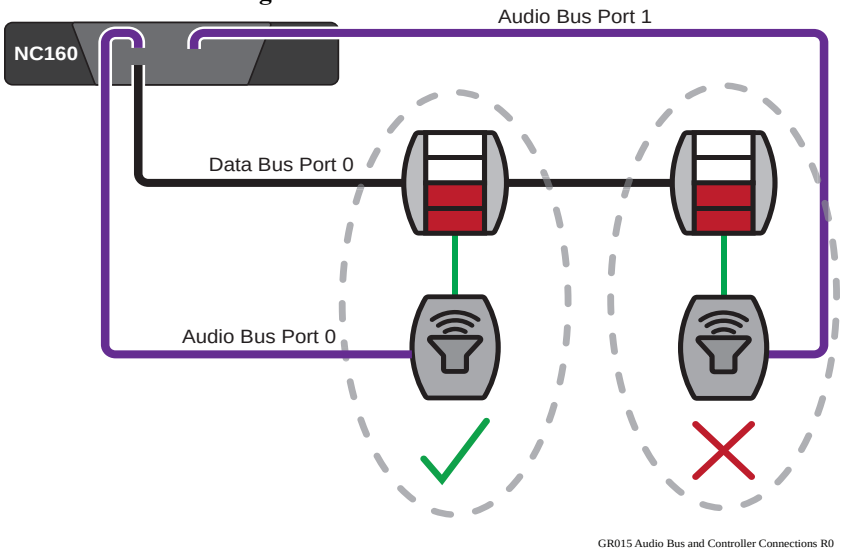
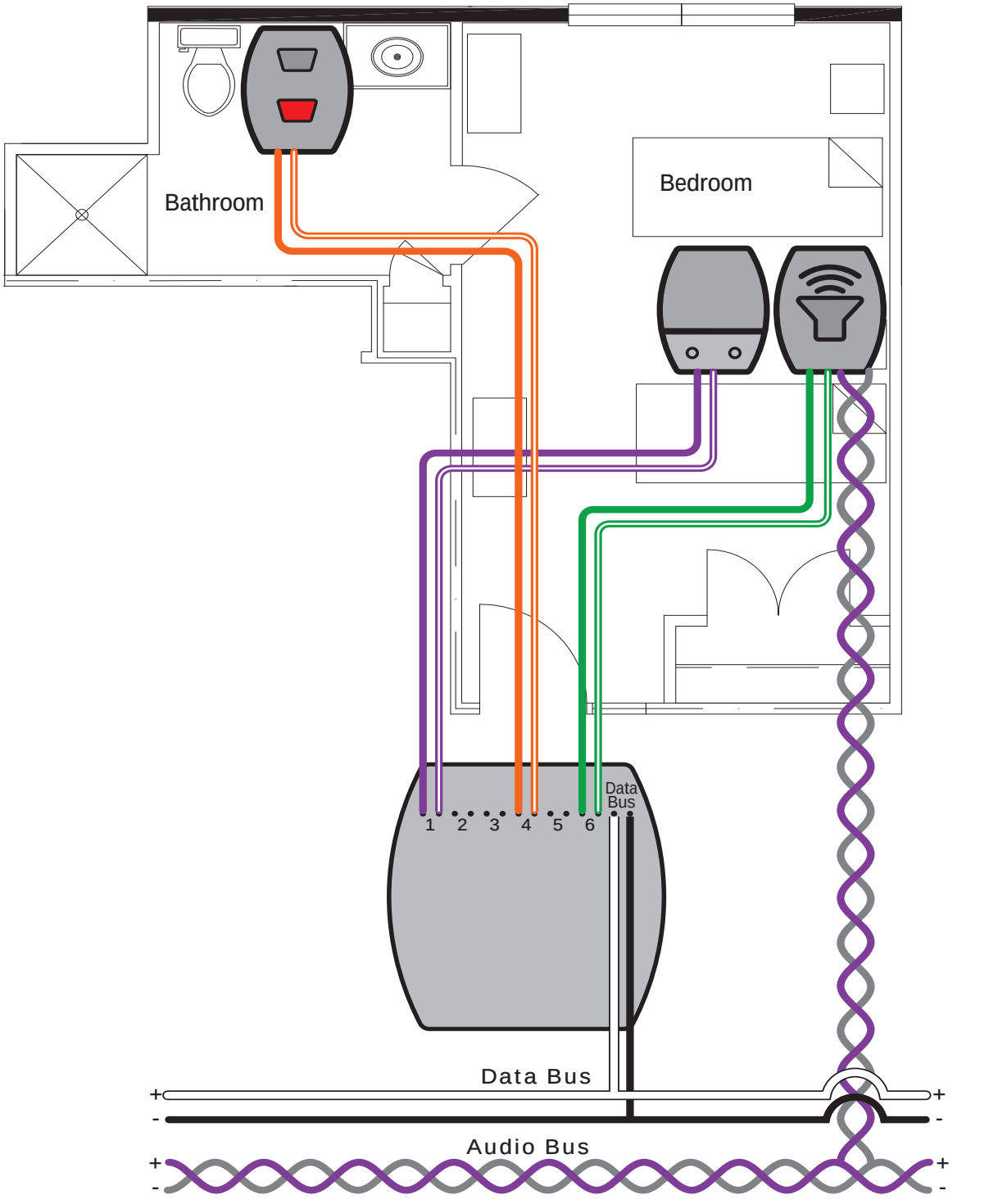


Figure 5 - Typical Room with one IR160 Audio Station



GR016 IR160 Audio Station in Typical Room R0

Audio Connection Considerations

The most common scenario for installing the Tek-CARE system is to have a single IR160 Audio Station associated with a single room controller, and thus, a single Station ID.

Up to four IR160 Audio Stations may be associated with a single Station ID, however, all IR160s associated with a station ID will open their audio connections simultaneously.

Example 1

In the example shown in **Figure 5 on page 13**, a single LI122UN room controller is installed outside of the room. An SF122 is connected to Point 1, an SF123 is connected to Point 4 (creating a Bath call) and an IR160 is connected to Point 6. Note that the audio cable never connects to the room controller.

In this example, all three stations are associated with a single Station ID, meaning that any call from this station ID (SF122 or SF123) is answered at the master station, the audio channel opens.

Example 2

The example shown in **Figure 6 on page 16** illustrates a slightly different wiring scheme utilizing the same room layout. In this example, everything is the same as before except there is an additional IR160 installed in the bathroom. Again, in this scenario, all four stations are connected to a single room controller, and associated with a single station ID.

In this scenario, a call from either the SF122 Patient Station or the SF123 Bath Station will open audio to both IR160 stations. This scenario requires that the system be manually configured to expect an IR160 connected to point 5.

Example 3

If unique audio in each location is desired, a Plus or Elite license is required for the LS450 Config Tool Software. This enables the points of one controller to be assigned to different station IDs.

Returning to **Figure 6 on page 16**, if the facility requires unique audio connections at both the bed and the bath areas, simply assign Points 1 and 6 of the room controller to a Station ID (e.g. RM 100) and the other two points to a different station ID (e.g. 100 BATH).

Once the points have been reassigned, answering calls or dialing each station ID will only open audio at the IR160 that is associated with that station ID.

Wiring Installation

Tek-CARE160 Data Bus Wiring

The main wiring for the Tek-CARE160 system consists of a two-wire communications data bus. The data bus ports on the front of the NC160 CE Module are capable of supporting 16 room controllers each, for a total of 64 controllers per module. Note that each port is capable of driving up to 1,000' of cable for the data bus. TekTone recommends 18/2 stranded cable for the data bus, but other types of wiring are acceptable. See the table below for details.

> ***Note:*** If 22 AWG cable is used, the data bus runs can be extended by twisting conductors together at each splice. For example, 22/4 cable used for data bus wiring could have two conductors twisted together for the positive leg of the data bus and two conductors twisted together for the negative leg.

	16 Controllers Max	12 Controllers Max	8 Controllers Max	8 Controllers Max
18 AWG Cable	1000'	1000'	1000'	1000'
20 AWG Cable	625'	800'	1000'	1000'
22 AWG Cable	350'	525'	750'	1000'
2 x 22 AWG Cable	775'	1000'	1000'	1000'
CAT5 with CT160	1000'	1000'	1000'	1000'

CAT5 Cabling Option

The CT160 is convenient for wiring from a module to room controllers. From the NC160CE, connect the CT160 two-wire pigtail to the data bus on the port. Refer to **Figure 1 on page 9**. CT160 can either be installed as a standalone with the mounting hardware (CT160K), or it can be snapped into the back of LI122UN dome lights and/or PM120 controller modules. Once installed, run or reuse CAT5 or better cable plugged into the CT160 and out to each dome or module. Refer to **Figure 7 on page 18** to note the positive and negative connections. Test CAT5 connections and meter cables for shorts and incorrect wiring to avoid issues later.

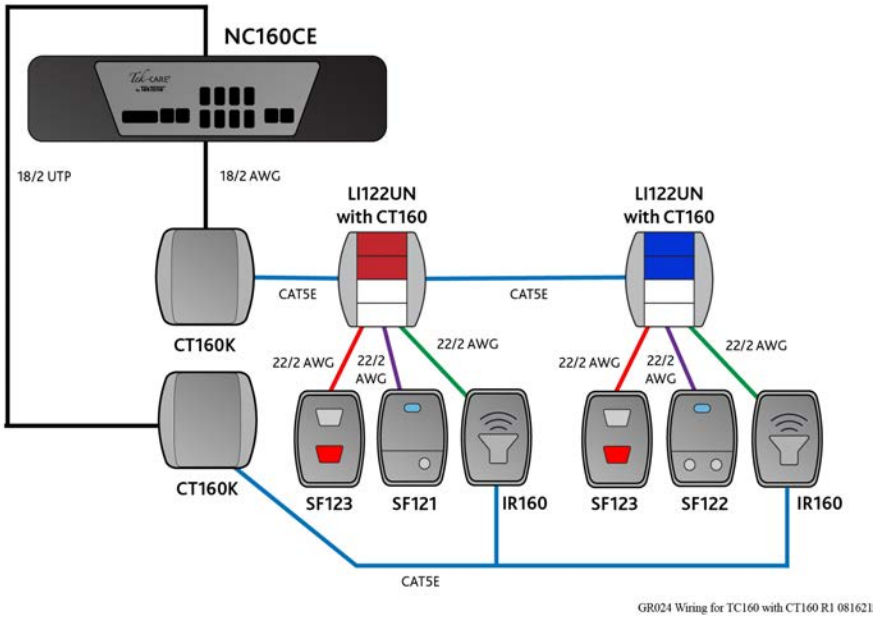
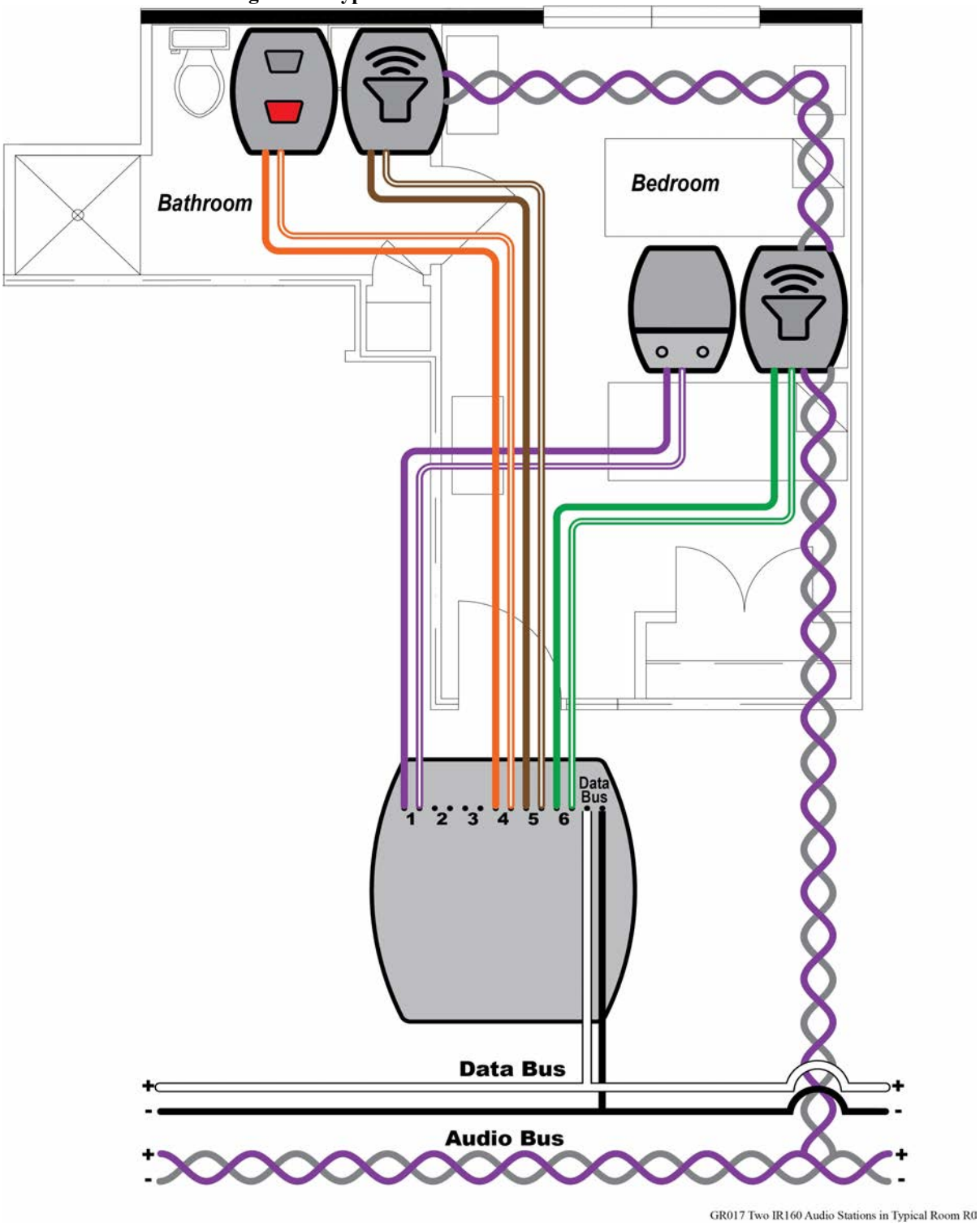


Figure 6 - Typical Room with two IR160 Audio Stations



Run wiring from room controller to room controller and connect the room controllers to the data bus in parallel using T-taps. Connect the positive wire in the data bus cable to the solid white wire (pin 13) on the back of the room controller, and connect the negative wire from the data bus to the black wire (pin 14) on the room controller.

Note: CAT5 cable is not recommended for use on the data bus of the Tek-CARE160 due to brittle conductors and difficulty in creating reliable crimp connections to larger gauge wire.

Tek-CARE160 Audio Bus Wiring

The audio bus for the Tek-CARE160 system is designed to operate on unshielded 18/2 AWG twisted cable. If a shielded pair cable is used for audio bus wiring, environmental conditions and testing will dictate if the shield should be grounded or floating.

Maximum audio bus cabling distance, including drops to IR160 Audio Stations, must not exceed 1,000' on each available port. Each IR160 station must be connected to the audio bus.

TekTone recommends pairing up an audio bus cable and data bus cable. For example, the data bus cable from port 0A should be paired with the audio bus cable from port 0A. These two 2-conductor cables should be pulled together. **Do not use a 4-conductor cable to combine the audio and data bus. This will produce extreme audio interference and drastically impact audio quality.**

> ***Note***: The single biggest factor in audio quality for the Tek-CARE160 system is the twist of the audio bus cabling. Any time a splice is made, or when the audio cable is connected to the IR160 header, twist the audio cables together as close to the splice as possible. Tape up the splice so the cables do not separate.

Use care when running audio bus cable. If possible, avoid running the audio bus cable near high voltage electrical cables. Also, try to neatly install the audio cable, avoiding intertwining it with the data bus cabling. Make neat splices using terminal strips or piercing connectors, and insulate all splices.

An IR160 Audio Station will open an audio connection when a call placed by any SF121, SF122, SF123, or PM123 assigned to the same Station ID as the IR160 is answered at a master station.

If a Station ID is dialed from the master station, an audio connection will be opened on all IR160s associated with that station ID.

Addressing Room Controllers and Default Behavior

The Tek-CARE160 system is designed to be simple to install. As such, the room controllers are designed so that a basic system can be brought online with minimal programming.

Each room controller must be addressed to communicate on the data bus using the five position DIP switch found on the back of the room controller. Available addresses are 0-31.

When assigning addresses to the room controllers, keep in mind which port the room controller is connected to. For purposes of addressing, the two left data bus ports (0A and 0B) and two right data bus ports (ports 1A and 1B) are tied together. This means that addresses for room controllers connected to port 0A and port 0B must be unique, but port 0A and port 1A may have addresses duplicated between them.

Keep detailed notes of the physical addresses and locations of room controllers installed in the facility using the worksheet in the back of this manual. Without adequate installation notes, system configuration will be extremely time consuming.

> ***Note:*** No terminating jumper or resistor is required on the data bus. If necessary, the data bus may also be installed using a star topology. Do not exceed 1,000 feet of cable on any one data bus run.

The address assigned to the room controller also influences the default behavior of the room controller. If a controller is addressed as 0-29, the system assumes that the controller will be installed in a single bed configuration. This is useful for simple one-to-one installations. Room controllers addressed as 30-31 are defaulted to duty station behavior. These default behaviors are modified during configuration setup if needed.

Connect Stations

Up to six stations may be connected to each room controller using the header on the back of the room controller. The leads on the header are paired together to form a point on the room controller. This means that each header has six points to connect stations to, and one point for data bus connections.

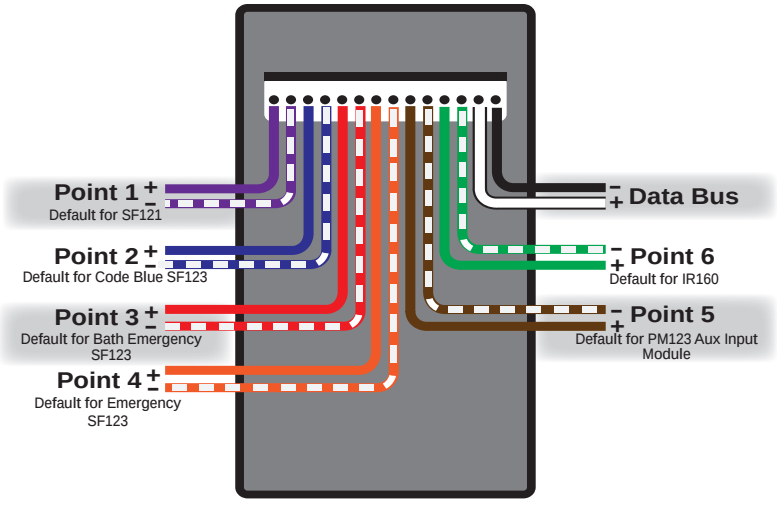
With the wire leads on the connector pointing down, Point 1 is on the left. The illustration below shows the six available points on the header. The point connections are arranged +-, +-, etc., with each group of +- connections making up one point.

Points Table

Point 1		Point 2		Point3		Point 4		Point 5		Point 6		Data Bus (Room Controller Only)	
+	-	+	-	+	-	+	-	+	-	+	-	+	-
Violet	Violet White Stripe	Blue	Blue White Stripe	Red	Red White Stripe	Orange	Orange White Stripe	Brown	Brown White Stripe	Green	Green White Stripe	White	Black

GR041 Points Table R0 080521

Figure 7 - Single Patient Station Default Room



GR018 LI122 Single Patient Station Default Room Controller Points R0

Figure 8 - Double Patient Station Default Room

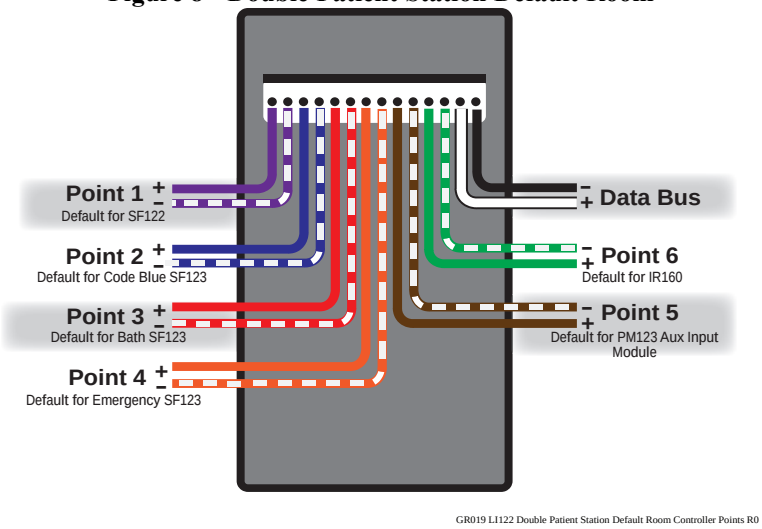
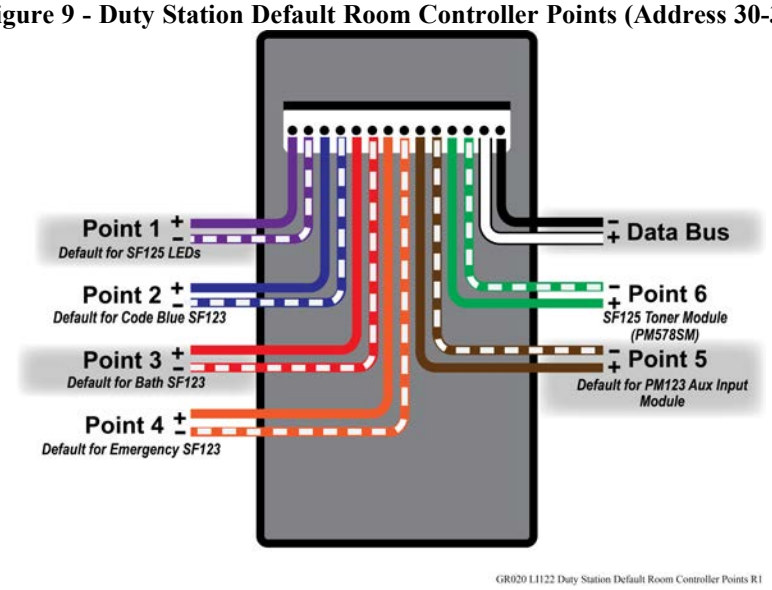


Figure 9 - Duty Station Default Room Controller Points (Address 30-31)



Tek-CARE160 Station Wiring

When installing wiring to stations, use 22-18 AWG cable. Do not exceed 100 feet of cabling for SF121, SF122, and SF123 stations. For SF125 stations, do not exceed 50 feet of cabling. Only one station may be connected to each point. **Do not splice multiple stations together on the same point wiring.**

One-to-One Installations

In most installations, one room controller will be used as a connection point for all of the station in the associated room. This provides the simplest software configuration option, but other installation strategies are available.

In a one-to-one installation, connect the stations to the room controller according to the **Points Table on page 18**.

Custom Installations

In other cases, a single room controller can be used to connect stations from multiple rooms or several beds in a ward-style installation. If stations are installed in this way, keep detailed notes that correlate the physical room the station is installed in and the DIP switch address of the room controller the stations are connected to. This information will be needed when creating the system configuration.

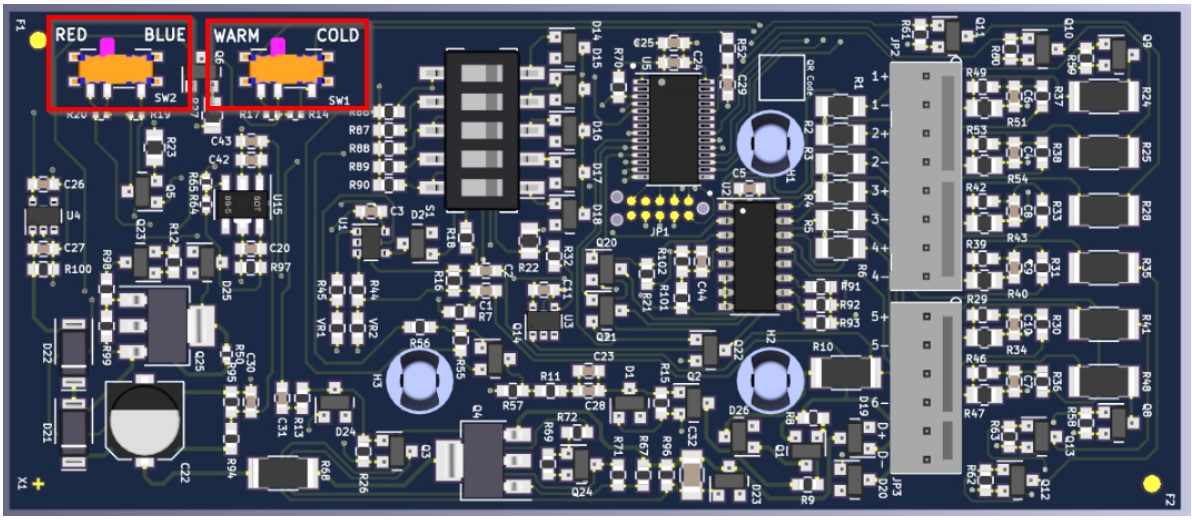
LI122UN LED Color Configuration

The LI122UN Room Controller has two switches for the LED colors of the dome light. Choose between red and white or blue and white LED options. The white LEDs are selectable for warm or cold hues. See the figure below for more details on the appropriate switch positions.

For high priority calls, choose either red and white or blue and white by setting the switch to the left for red or to the right for blue.

For low priority calls, the white LEDs can either have warm or cool hues selected by setting the switch to the left for warm or to the right for cold.

Figure 11 - LI122UN LED Configurations



The default switch positions for the LI122UN are for red and cold.

IMPORTANT: Make sure to set the switch all the way over to one side or the other. Do not leave the switch in the middle between the two color choices. This can prevent either color LED from activating.

If the switch is mistakenly set in the center, the LEDs will not show when calls are active.

The LED colors in the config tool MUST match the color that has been configured on the LI122UN Room Controller.

Housing Considerations

Use an IH121K housing for a single SF12x or IR stations. Use an IH122K housing if installing an SF and IR station together or putting together a blank panel. See individual spec sheets for mounting details.

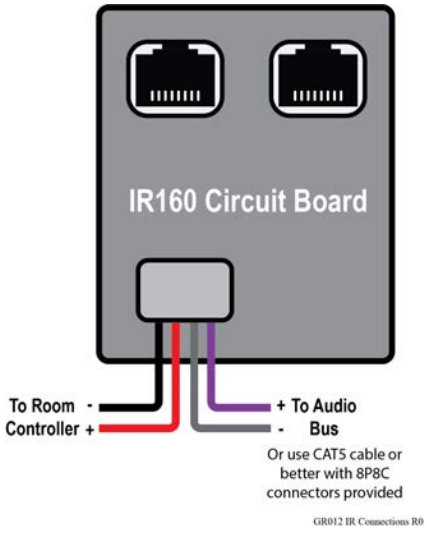
Station Connection Instructions

IR160 Audio Stations: IR160 Audio Stations require two connections, one to the audio bus and one to the LI122UN Room Controller.

Connect the red wire on the IR160 to the positive wire of the desired point on the room controller, and connect the black wire of the same point.

Connect the violet wire on the IR160 station to the positive leg of the audio bus. Connect the gray wire on the IR160 station to the negative leg of the audio bus.

Figure 12 - IR160 Connections



CAT5 Cabling Option: NC160 Audio Bus

The CT160K can also be used with the NC160 audio bus. Use a CT160K at the central location to convert the audio bus from 2-wire to CAT5 (or better) cabling terminated to the T568B standard. IR160 speaker stations also support in and out 8P8C connections as well. Please note this is for the audio bus only. A data bus connection from the IR160 to the controller is still required.

SF121 Single and SF122 Dual Patient Stations: Connect the red lead from the station to the positive terminal on the desired point of the room controller and connect the black lead to the negative terminal of the desired point on the room controller. If possible, connect the patient station to Point 1. This is the default connection point for patient stations in a single or dual bed installation.

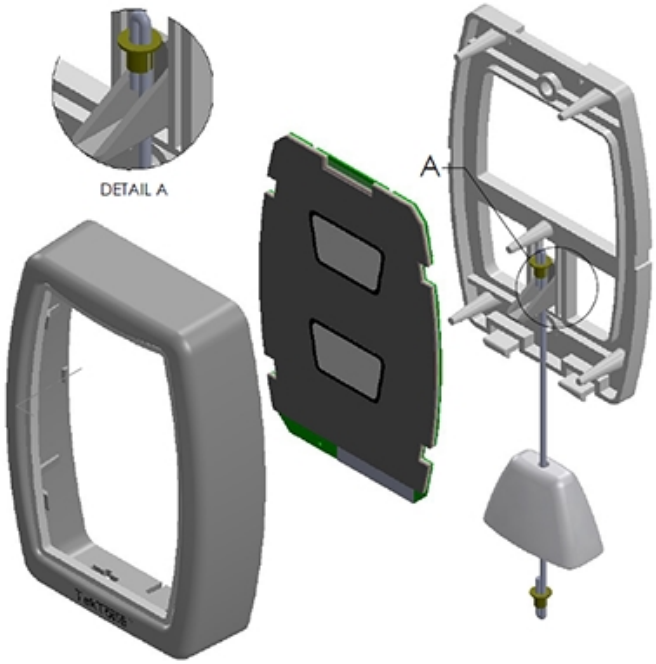
SF123 Two-Button Pull-Cord Station: Slide the desired call type insert into the slot on the front of the station. Snap the circuit board into the front bezel by spreading the face of the bezel while placing the circuit board into the retaining clips.

Install the rear bracket on the wall or junction box using the two screw holes in the bracket. If a pull string is used, push an end of the pullstring through the hole in the slider contained on the bracket. Use the included brass ferrule to crimp onto the string. Trim the string to the appropriate length and insert it through the hole in the plastic handle. Crimp the remaining ferrule onto the string below the handle.

> ***Note:*** Push the slider up into the retaining nibs on the rear bracket. Failure to push the slider up and secure it will result in station damage during installation.

- To use an SF123 as a **Code Blue** switch, connect it to **Point 2 (Blue and Blue/White)** on the room controller.
- To use an SF123 as a **Bath Emergency** switch, connect it to **Point 3 (Red and Red/White)** on the room controller.
- To use an SF123 as an **Emergency** switch, connect it to **Point 4 (Orange and Orange/White)** on the room controller.
- If a custom call type is desired, note which point the SF123 station is connected to using the worksheet in the back of this manual. This information will be used during configuration setup.

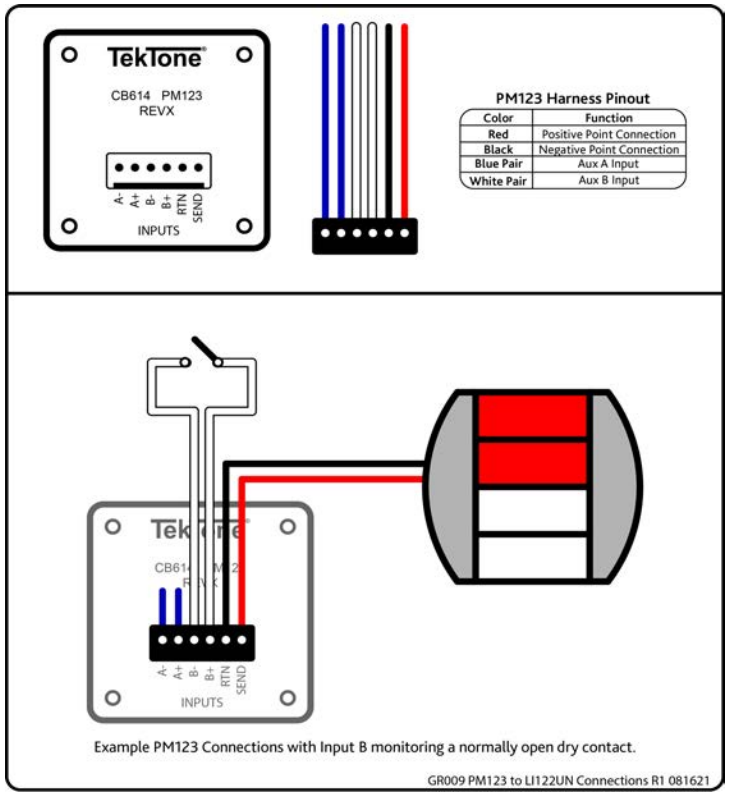
If an SF123 is to be used as a Check In/Reset station, connect it to any unused point of the room controller. Be sure and note the point that it is connected to, so it can be correctly programmed during configuration setup. For more information about Check In, see **Room Level Reset on page 33**.



SF125 Duty Station: Connect the red lead from the SF125 LED panel to the positive terminal of the desired point on the room controller and connect the black wire to the negative terminal of the desired point on the room controller. Connect the positive and negative leads from the toner module to another point. If possible, connect the SF125 LED panel to Point 1, and the toner module (PM578SM) to Point 6. These are the default point connections for a room controller set up with the duty station present.

PM123 Auxiliary Input Module: Remove the top cover from the PM123 case. Inside, note the PM123 harness and six wires. Connect the wiring from the room controller and switches to the PM123 Module. Connect the positive terminal of the desired point on the room controller to the **Send** terminal, and connect the negative point of the desired point to the **Return** terminal. If possible, connect the PM123 Module to point 5, which is the default connection point for the PM123.

Figure 13 - PM123 Connections



Connect the normally open dry contact to be monitored to **Contact 1** or **Contact 2**. There are three available functions for the PM123 in the Config Tool, **Aux Input 1** (with **A** and **B** sides), **Aux Input 2** (with **A** and **B** sides), and **Aux Check In**.

Note that **Contact 1** will appear as **Aux Input 1A** or **Aux Input 2A** in the Config Tool software depending on the function selected. **Contact 2** will appear as **Aux Input 1B** or **Aux Input 2B.** Aux inputs are non-latching by default but can be configured to be latching within the LS450 Config Tool Software.

The PM123 may also be used as a check in device. If a normally open dry contact is connected to **Contact 1**, and the contact is closed at any point during the check in window, the check in requirement will be satisfied. If a device such as a motion detector or pressure pad is used for check in, connect the output from the device to **Contact 1**.

If a normally open dry contact is connected to **Contact 2** and changes state at any point during the check in window, the check in requirement will be satisfied. This is useful if a door contact switch is to be used for check in. In this instance, if the switch is closed at the start of the check in period, opening the switch at any point during the check in period will satisfy the check in requirement.

For more information about check in, see **Check In on page 33**.

Connect NC415AV/NC404TS Master Stations

The two 8P8C jacks on the right side of the NC160 CE Module are the connections for the NC415AV/NC404TS Master Stations. Each jack supports three NC415AV or five NC404TS Master Stations with no more than 1,000 feet of CAT5 or better cabling on the run. Wire the 8P8C connectors for the NC415AV Master Stations according to the T568B standard.

To connect more than one NC415AV/NC404TS Master Station to each port, use a CT400P5 splitter at any point along the master station cabling run.

Figure 14 - T568B Standard Wiring

8P8C Pin #	Wire Color (T568B)
1	White/Orange
2	Orange
3	White/Green
4	Blue
5	White/Blue
6	Green
7	White/Brown
8	Brown

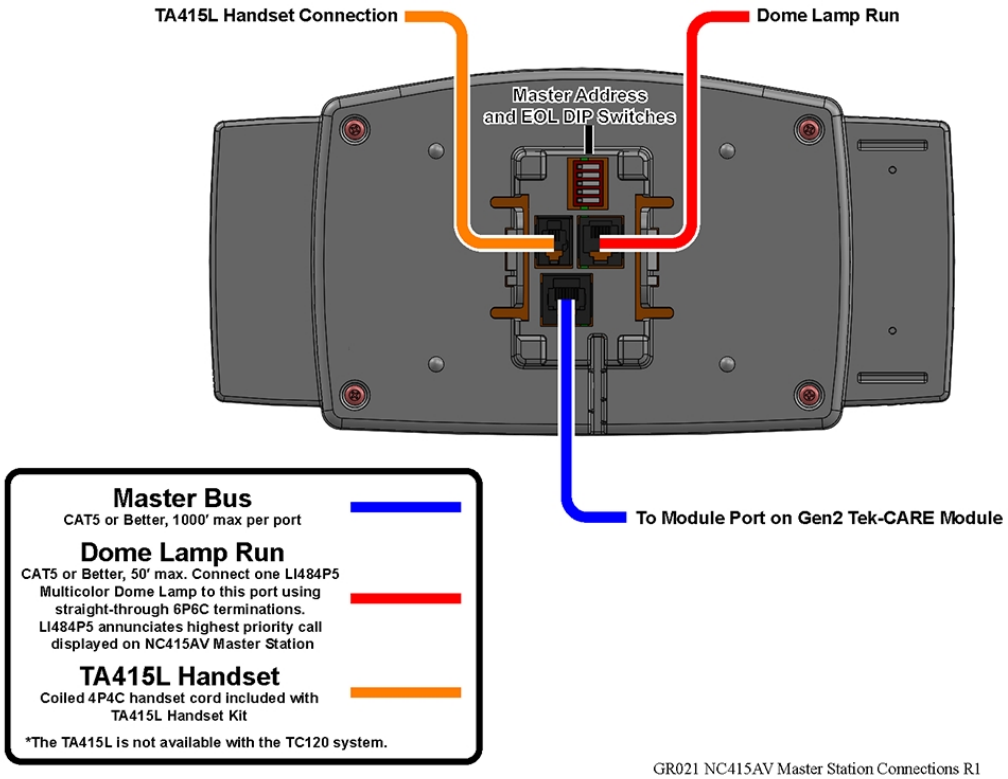
GR040 T-568B Pinout R0 072221

Much like room controllers, each NC415AV/NC404TS Master must also be assigned a unique address (**0**, **1**, **2, 3, or 4**) using the DIP switch on the rear of the master. The NC160 CE Module will automatically assign a master name (e.g., 01M1) to each master. This name can be changed in the LS450 Config Tool software.

Up to six NC415AV or 10 NC404TS Master Stations may be connected to a single NC160 CE. Connect up to three NC415AV or five NC404TS masters to each 8P8C jacks labeled Master Station on the front of the NC160 CE.

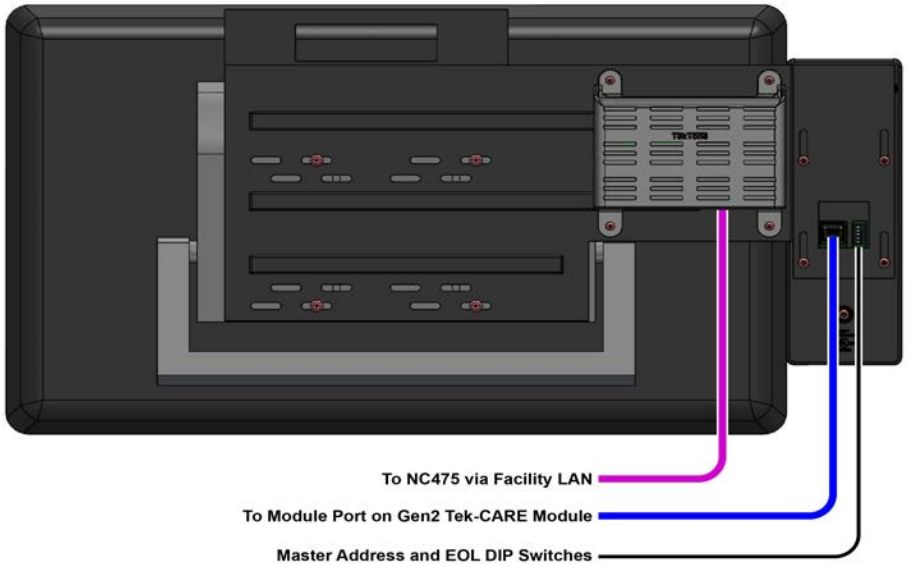
The last NC415AV or NC404TS Master Station that is furthest away from the CE should have a DIP switch 5 on for the EOL resistor.

Figure 15 - NC415AV Master Station Connections



GR021 NC415AV Master Station Connections R1

Figure 16 - NC404TS Master Station Connections



GR022 NC404TS Master Station Connections R0

Figure 17 - TA415L Handset

TA415L Handset Kit If the NC415AV Master will be equipped with handset audio, the TA415L handset kit must be installed. Install the handset cradle on the NC415AV Master using the two screws included with the kit as shown. Connect the included coiled cord between the handset and the 4-pin jack on the rear of the NC415AV.

Multicolor Zone Dome

If desired, a zone dome light (part number LI484P5) may be connected to the master station using the 6P6C jack on the back. The zone dome light will illuminate whenever a call is present on the connected master station.

Use CAT5 or better cabling to connect the LI484P5 to the NC415AV Master Station and wire the 6P6C with a straight-through configuration. Do not exceed 50 feet of cabling for dome light connection.

Connect Data Bus Wiring

Before connecting the data bus wiring to the NC160 CE Module, check the data bus wiring for shorts. Connect the positive wire in the data bus cable to the positive terminal on the NC160 CE Module port and the negative wire in the data bus cable to the negative terminal on the NC160 CE Module using the included plugs.

Note which station run gets plugged into which CE module port. This information will be needed when setting up the system configuration.

Connect Audio Bus Wiring

Check the audio bus cabling for shorts before connecting it to the NC160 CE Module. Use the included connectors to connect the audio bus cables to the audio ports on the face of the NC160 CE Module. Be sure and note the polarity before making any connections. Remember to note which IR160 audio stations are connected to which audio bus run.

Connect Master Bus Wiring

Connect the master bus cabling to the ports on the right side of the NC160 CE Module. Keep a record of the locations of master stations and their automatically assigned names. Once the system is powered on for the first time, go to each master station on the system and touch the **Menu** button on the home screen, then touch the **This Master** button that appears. The top of the screen will display the default name of the master station. Note this information, as well as the actual location of the master station for use during system configuration.

If more than one NC415AV or NC404TS Master Station is installed on a master bus run, use a CT400P5 splitter to provide multiple connections to a single master bus port.

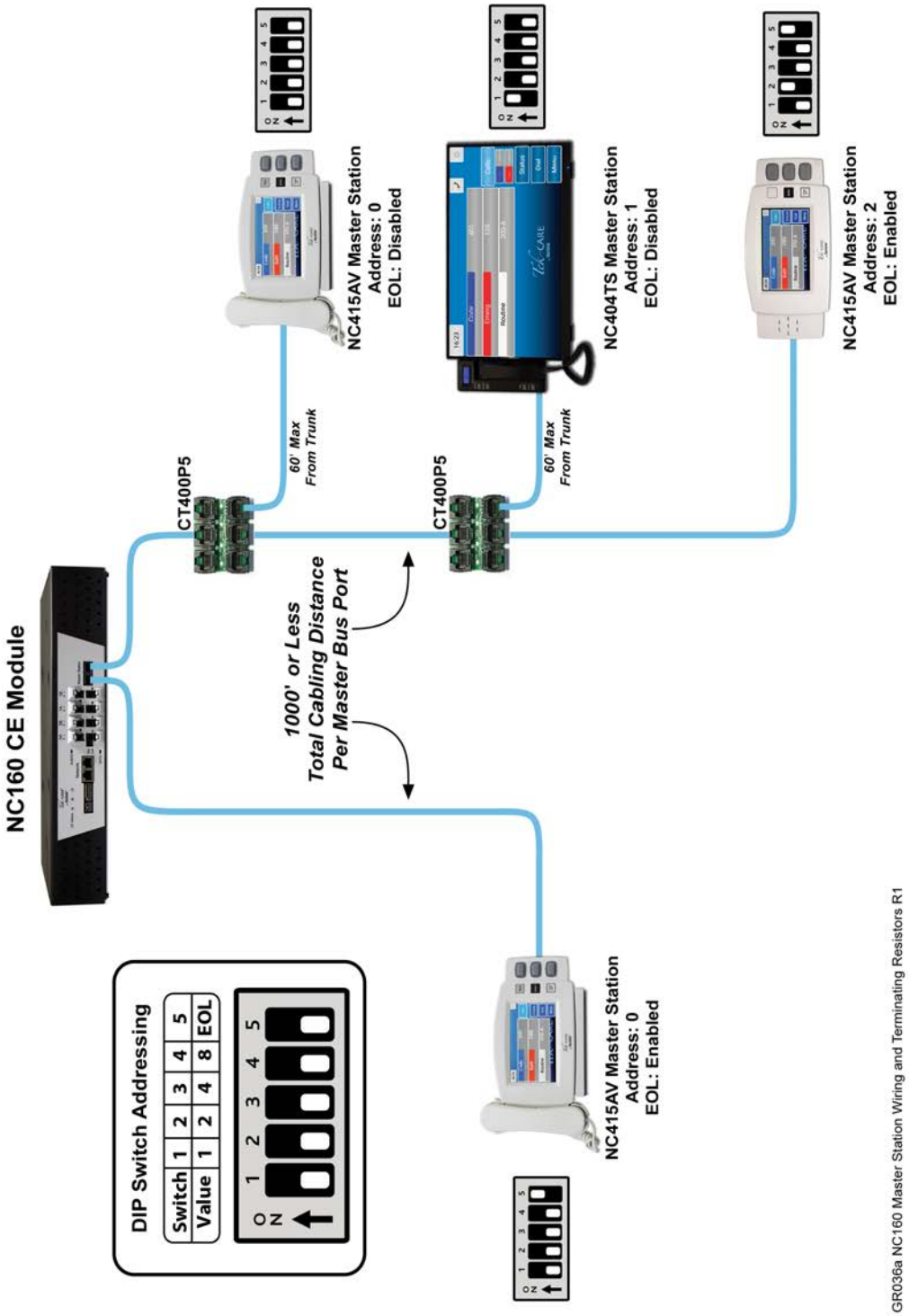
> ***Note***: The final master station on each master bus should have its internal terminating resistor enabled. Turn DIP switch 5 on the rear of the NC415AV or NC404TS Master Station ON to enable the terminating resistor. See **Figure 15 on page 24** for more information.

Networking Multiple NC160 CE Modules

If multiple modules are to be networked together, use the DIP switches on the face of the modules to set unique module IDs for each CE module as discussed in **The NC160 Central Equipment Module on page 10**.

Once each Module has been assigned a unique address, connect the modules to each other using the Network Ethernet jacks on the left side of the units. Modules are connected using CAT5 or better cabling terminated using 8P8C connectors using the T568B standard. Once the modules are networked together, proceed to **Configuration Setup on page 28**.

Figure 18 - NC415AV Master Station Wiring and Terminating Resistors



Configuration Setup

Once hardware installation is complete, set up the system configuration. The LS450 Config Tool is used to configure the system, and is installed on a technician's programming laptop.

To begin setting up the system configuration, ensure that the NC160 CE Modules are powered on, uniquely addressed, and networked together.

Connect the LS450 Config Tool Programming Software

In order to connect to the NC160 CE Modules, the IP address of the computer used for programming must be on the same subnet as the NC160 CE Modules. Set the static IP of the laptop to be 192.168.1.178.

Next, connect a standard Ethernet patch cable between the programming computer and the networked CE modules.

About Points

The most important concept of the Tek-CARE160 system are the points on the LI122UN and PM120 Room Controllers. The points are the six physical connections on the rear of each controller, shown as points 1-6 in the configuration. In addition to the physical points, there are also two additional points present in the configuration, one for the red dome LED and one for the white dome LED.

By default, all of the room controller points are assigned to a Station ID in the Config Tool. The physical address of the room controller determines which Station ID points are assigned by default. In the example below, notice that points 1-6 on the controller with **Address 0 on Port 0 of Module 1** are assigned to **Station 0100** by default.

Figure 19 - Points in the LS450 Config Tool

Module : Port : Address	Point	Assigned Station	Exists
01:0:06	1 (Purple)	406	Detectable
01:0:06	2 (Blue)	406	Detectable
01:0:06	3 (Red)	406	Detectable
01:0:06	4 (Orange)	406	Detectable
01:0:06	5 (Brown)	406	Detectable
01:0:06	6 (Green)	406	Detectable

Note: In order to assign points on a single controller to multiple stations, an LS450 Config Tool Plus or LS450 Config Tool Elite license is required.

A Tek-CARE160 point can be in three states.

Detectable: When points are in the **Detectable** state, the central is constantly polling those points, searching for attached stations. If a station is detected, the system assumes that the station type conforms to the standards found in the **Station Connection Instructions on page 21**.

Exists: If a point is marked as **Exists**, the point is supervised and the system assumes that a station is connected to that point. If a station goes missing or is not detected, a fault will annunciate for that point.

Disabled: If a point is marked as **Disabled**, the system does not look for station attachment at the point.

Configuration Methods

There are two ways to set up a Tek-CARE160 configuration. The first and simplest method requires stations to be wired to the room controllers as shown in **Figure 7 on page 18** If all stations are connected to their room controllers on the default points, then the room controllers and stations installed on the system can be automatically detected and put into use. The only required programming in this instance is system customization. This scenario will be referred to as an **Autodetect Setup**.

The second method is used when custom wiring is required because multiple stations that create the same type of call are connected to a single room controller. Custom wiring scenarios include facilities that have three or more beds per room (requiring multiple SF121 Single Patient Stations and/or SF122 Dual Patient Stations per room) or in an area where two or more Code Blue or Emergency switches are connected to the same room controller. This scenario will be referred to as a **Custom Setup**.

Note: Custom Tek-CARE160 installations require a **Plus or Elite** license for the LS450 Config Tool.

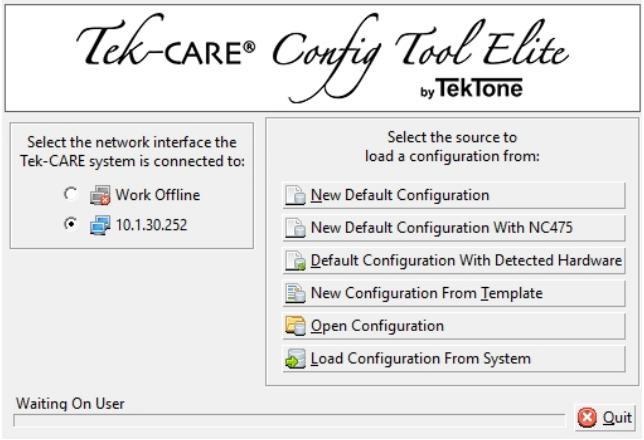
Please refer to IL855 LS450 Config Tool manual for more information and further instruction on how to use the LS450 Config Tool.

Configure an Autodetect Configuration

Before beginning system programming, perform a complete test of the system. Ensure that calls annunciate at the expected LI122UN Room Controllers and that call type annunciation from SF123 2-Button Pull-Cord stations are correct.

Start the LS450 Config Tool software. On the splash screen, choose the IP address of the Tek-CARE160 system on the left and select **Load Configuration from System** on the right. The default configuration will be loaded into the LS450 Config Tool software.

Figure 20 - Config Tool Splash Screen



Next, choose **File>Save Configuration As**, choose a descriptive file name, and save the configuration.

Enabling and Naming Modules

Navigate to the **Modules** page. In the **Modules** list, verify that all of the installed NC160 CE Modules installed on your system are marked as existing.

Note that the Number in the Modules list corresponds to the DIP switch address of the CE modules.

If desired, add **Location** for the module. To add a location for a module, select a module from the list and click the **Edit** button to unlock the **Details** pane for editing. Type a location into the **Location** field, and click the **Apply** button.

Repeat this process for each module installed on the Tek-CARE160 system. If a Tek-CARE server is installed, scroll to the bottom of the **Modules** list and enable the NC475 Module.

Changing Station Names

Next, change the default station names to names that make sense for the facility.

> ***Note:*** The default station names are a combination of the CE module address, the port number that a room controller is connected to, and the DIP switch address of the room controller. The CE module address provides the first two digits of the default station name (01-75), and the address of the room controller provides the second two digits (00-63).

If the room controller is connected to port 0A or 0B, only the address of the room controller is used. If the room controller is connected to port 1A or 1B, add 32 to the address of the room controller to obtain the last two digits of the default station name.

For example, a room controller addressed as 12 connected to port 0A or 0B of CE 01 would be assigned a default station name of 0112. If the same room controller (address 12) were connected to port 1A or 1B of CE 02, it would be assigned a default station name of 0244.

Using the notes generated during system installation, change the default stations names to those desired by the facility.

Begin by selecting **Stations** in the page selection pane of the Config Tool software. Choose the first station you wish to edit, then click the **Edit** button in the upper right corner of the **Stations** pane. The pane will unlock for editing.

Select the default station name and delete it. Type a new name in place and click **Apply**.

Repeat for all remaining stations to be customized.

Edit Stations

Occasionally, depending on system requirements, some changes will need to be made to the default stations. Most commonly, SF122s may have been installed on point 1 of the facility's room controllers, PM123s may need to be set up as **Aux Input 1**, **Aux Input 2**, or **Aux Check In** functions using the Functions drop-down menu, or SF123s may need to be programmed as reset buttons using the **Function** drop-down menu.

Select **Points** in the page selection pane of the Config Tool. Click **Edit Multiple** in the details pane to open the **Edit Multiple** window.

Referring to the completed programming worksheet created during installation, select the stations to be edited. Choose a group of stations that are wired the same way. If there are multiple wiring configurations on the system, break the stations into groups, e.g., Wiring Configuration A, B, C, etc. Select all of the wiring configuration A stations and edit them, then select all of the wiring configuration B stations and edit them, etc. Once the edit multiple window is open, select the Station IDs to be edited.

Once stations are selected, enable the points that have stations connected and choose the correct station type and behavior. Mark any unused points as disabled.

Ensure that both the Red/Blue and White domes are marked as **Exists**. Select **LI122_R** if the room controller has red LEDs or **LI122_B** if the room controller has blue LEDs. If the station must be set up as a duty station or a zone light, change the behavior of the red/blue and white domes to Red or Blue Zone Dome and White Zone Dome respectively. This will enable the Station ID to watch zones on the system and annunciate a call when needed.

> **IMPORTANT:** The LED colors in the config tool MUST match the color that has been selected on the LI122UN Room Controller.

The **Single Bed**, **Dual Bed**, and **Duty/Zone** buttons at the bottom of the **Edit Multiple** window can be used to quickly set up the default station connection points.

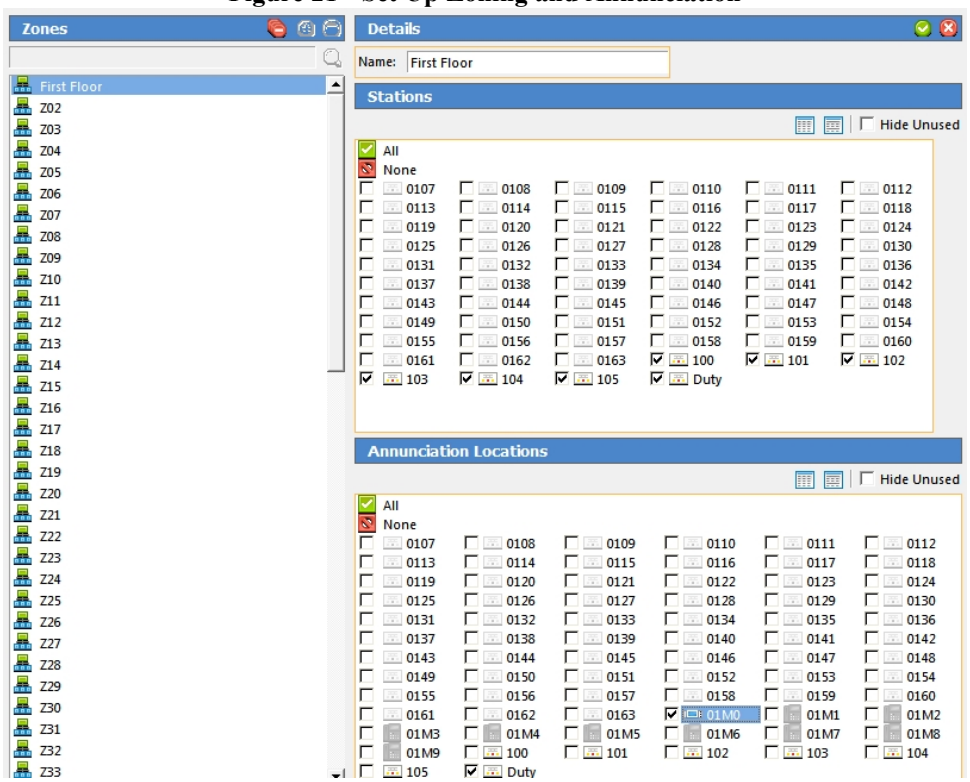
Ensure that the **Virtual Station Exists** box is checked. This will automatically enable the Station ID selected and simplify future editing.

Once all selections have been made, click the **Apply** button. Repeat the edit multiple process for all wiring configurations.

Zoning Stations

To place stations in zones, select **Zones** in the page selection pane of the Config Tool. Select a zone for editing and click the **Edit** button.

Figure 21 - Set Up Zoning and Annunciation



Rename the zone with a descriptive name that makes sense for the facility.

In the **Stations** pane, select the stations to be included in the zone.

In the **Annunciation Locations** pane, select where to annunciate the calls from the stations in the selected zone.

Click **Apply** to save your changes. Repeat for all zones required by the facility.

Room Level Reset

SF123s can be programmed as **Reset Buttons** to enable the room level reset and check in features. With the SF123 programmed as a reset button, the upper button on the station becomes inoperable. When the lower button is pressed, any calls annunciating from the same station ID that the SF123 Reset Button is assigned to will be automatically reset.

SF123 Reset buttons are not automatically detected by the system on start-up. Refer to the **Edit Stations** section for information on setting up SF123 Reset Buttons.

For example, an LI122UN Room Controller connected to NC160 CE Module 1, Port 0, has its DIP switch address set as 0. By default, the dome light and all devices connected to that controller are assigned to the default station 0100. The table below shows the devices connected to the room controller.

	Point 1	Point 2	Point 3	Point 4	Point 5	Point 6
Device	SF122 Routine	SF123 Code	SF123 Bath	None	None	SF123 Reset
Station	0100	0100	0100	0100	0100	0100

The **SF123 Reset Button** will reset all calls from a station simultaneously. In the table above, if the SF122, SF123 Code, and SF123 Bath were all in alarm at the same time, a single press of the SF123 Reset Button would reset all calls from Station 0100 simultaneously.

Check In

If the facility uses SF123 stations set up as Check In/Reset stations or PM123 Aux Input Modules as **Aux Check In Devices**, check in times must be added to the system for the check in feature to function. A check in time is a time period during which the system expects to see a check in input triggered. If the check in input is not triggered during the scheduled time period, an Inactivity call annunciates on the system. Create several check in times so that each patient can be assigned a check in time that coincides with their normal waking schedule. Patients can also be assigned one check in time for weekdays and another for weekends. The table below illustrates some sample check in times.

Start Time	End Time	Week Days
5:00	6:00	SMTWTFS
6:00	7:00	SMTWTFS
7:00	8:00	SMTWTFS
7:00	8:00	MTWTF
8:00	9:00	S.....S

Create Check in Times

1. Click on the **Check In** tab in the Config Tool.
2. Click on the **Add** button in the **Check In Times** area.
3. Using the 24-hour military time, enter a **Start Time** and an **End Time** in the **Details** area. Midnight is 0:00. Start and End times must be at least 10 minutes apart.
4. Use the checkboxes to select which days of the week this event is scheduled.
5. Click the **Apply** button.

   Note: A single time period cannot cross midnight into the next day. Divide it into two time period entries. For example, create these two entries to create a scheduled time period of 6:00 PM Friday to 10:00 AM Saturday:

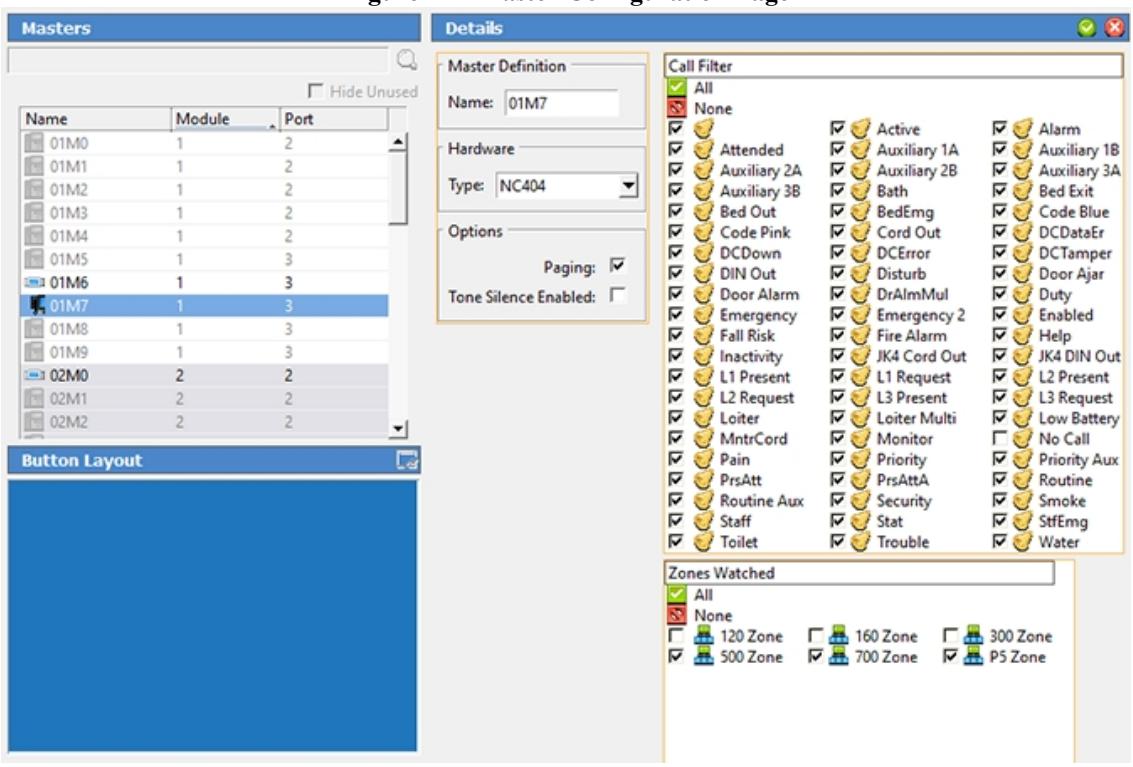
Begin - 18:00	End - 23:59	Day - Friday
Begin - 0:00	End - 10:00	Day - Saturday

Editing Master Stations

If desired, the default names of the master stations (e.g., 01M1) can be changed to a more descriptive name. To do this, navigate to the **Masters** page in the LS450 Config Tool.

With the master stations powered on, touch the **Menu** button on the screen of the NC415AV or NC404TS Master Station. Select the **Info** button from the menu that appears, and note the device name (e.g., 01M1) that has been assigned to the master station.

Figure 22 - Master Configuration Page



Select **Masters** from the page selection pane of the Config Tool. In the list of masters that appears, select the master to be renamed.

Click the **Edit** button to unlock the **Details** pane for editing. In the details pane, give each master a unique descriptive name.

If desired, the details pane can also be used to set up call filtering and zones watched for the master. The **Call Filter** determines what call types the master station displays and the **Zone** filter determines which zone's calls annunciate on the selected master station. Choose **Tone Silence Enabled** to silence the tone for that master.

Once all changes have been made, click the **Apply** button.

Disable Detectable Points

Once basic setup is complete, disable the unused points on the system. This lightens the load on the NC160 CE Modules and allows for faster alarm transmission. If unused points are not disabled, the CE module will continuously poll all detectable points for station connection.

To disable all detectable points, select **Points** in the page selection pane of the Config Tool. In the **Details** pane, click the gray **Disable All Detectable** button. A warning will appear noting that this action cannot be undone. Click **OK**.

For an autodetected system, configuration is now complete. Choose **File>Save Configuration** and then choose **File>Commit Configuration to System.**

Configure a Custom System

Use the following set of instructions to program the system if custom wiring is used.

Start the LS450 Config Tool software. On the splashscreen, choose the IP address of the Tek-CARE160 system on the left and select **New Default Configuration** on the right. The default configuration will be loaded into the LS450 Config Tool software.

Next, choose **File>Save Configuration**. Choose a descriptive file name, and save the configuration.

Refer back to **Configure an Autodetect Configuration on page 29** to enable and name modules and points.

Set up Room Controller Points

Once the modules have been edited, it is time to enable the points that the stations are connected to.

Refer to the completed programming worksheet that was created during system installation to ensure correct programming.

The most important concept to remember during system configuration is the relationship between points and Station IDs.

The most common scenario is a one-to-one association. For example, a room controller that has been given the address 1 on its DIP switches would be installed outside of room 101. Any stations in the room would be connected to the appropriate points on the rear of the room controller.

There are two steps for setting up points. First, edit each Station ID using the **Edit Multiple** window, then change station assignments if necessary.

Select **Points** in the page selection pane of the Config Tool. Click **Edit Multiple** in the details pane to open the **Edit Multiple** window.

Referring to the completed programming worksheet created during installation, select the default stations to be edited. Select a group of stations that are wired the same way.

If there are multiple wiring configurations on the system, break the stations into groups, e.g., Wiring Configuration A, B, C, etc. Select all of the wiring configuration A stations and edit them, then select all of the wiring configuration B stations and edit them, etc.

Once the edit multiple window is open, select the Station IDs to be edited. Once stations are selected, enable the points that have stations connected and choose the correct station type and behavior.

Ensure that both the Red/Blue and White domes are marked as **Exists.** Select **LI122_R** if the room controller has red LEDs or **LI122_B** if the room controller has blue LEDs. If the station must be set up as a duty station or a zone light, change the behavior of the red/blue and white domes to Red or Blue Zone Dome and White Zone Dome respectively.

This will enable the Station ID to watch zones on the system and annunciate a call when needed.

The **Single Bed**, **Dual Bed**, and **Duty/Zone** buttons at the bottom of the **Edit Multiple** window can be used to quickly set up the default station connection points.

Ensure that the **Virtual Station Exists** box is checked. This will automatically enable the Station ID selected and simplify future editing.

Once all selections have been made, click the **Apply** button. Repeat the edit multiple process for all wiring configurations.

For information on room level reset, check in, editing stations, zoning stations, and disabling points refer back to **Configure an Autodetect Configuration on page 29**.

Secondary Dome Annunciation

If desired, calls from one station may be forced to annunciate on the dome light of another station. The dome light set up as the secondary annunciator must be on the same module as the primary annunciator.

To choose a dome light to serve as a secondary annunciator, navigate to the primary station in the **Stations** page. Select the desired secondary dome annunciation station from the drop-down menu.

Repeat for all remaining stations requiring secondary dome annunciations.

Move Points to Stations

Occasionally, it may be necessary to assign a point to a different station than it is defaulted to. To move points between Station IDs, select the point to be moved from the points list, then click the **Edit** button. From the assigned Station menu, select the Station ID and click the **Apply** button.

Editing Hardware Behaviors

By default, the Tek-CARE160 system generates Routine calls from SF121s and SF122s, and Code, Bath, Emergency, and Emergency 2 calls from SF123s, depending on the function selected in the points list. PM123s will generate Aux Input 1 or Aux Input 2 calls by default.

To change the type of call generated, select **Behaviors** in the page selection pane of the Config Tool. Click the **Edit** button in the **Details** pane to unlock it for editing.

The call types generated by various inputs on the system can be edited on the hardware page shown in **Figure 23 on page 37**. **Escalation** may also be set for SF121s and SF122s.

For PM123s, note that Aux Input 1 and Aux Input 2 calls follow the position of the monitored switch. When the normally open switch is closed, the selected call is placed, and when the switch opens again, the call automatically clears.

To program a PM123 with latching calls that must be acknowledged from a master station, use the selections for Aux Input 1A/1B Acknowledged. This will trigger a call when the switch closes, and the call will remain latched in the system until it is acknowledged, regardless of the position of the switch.

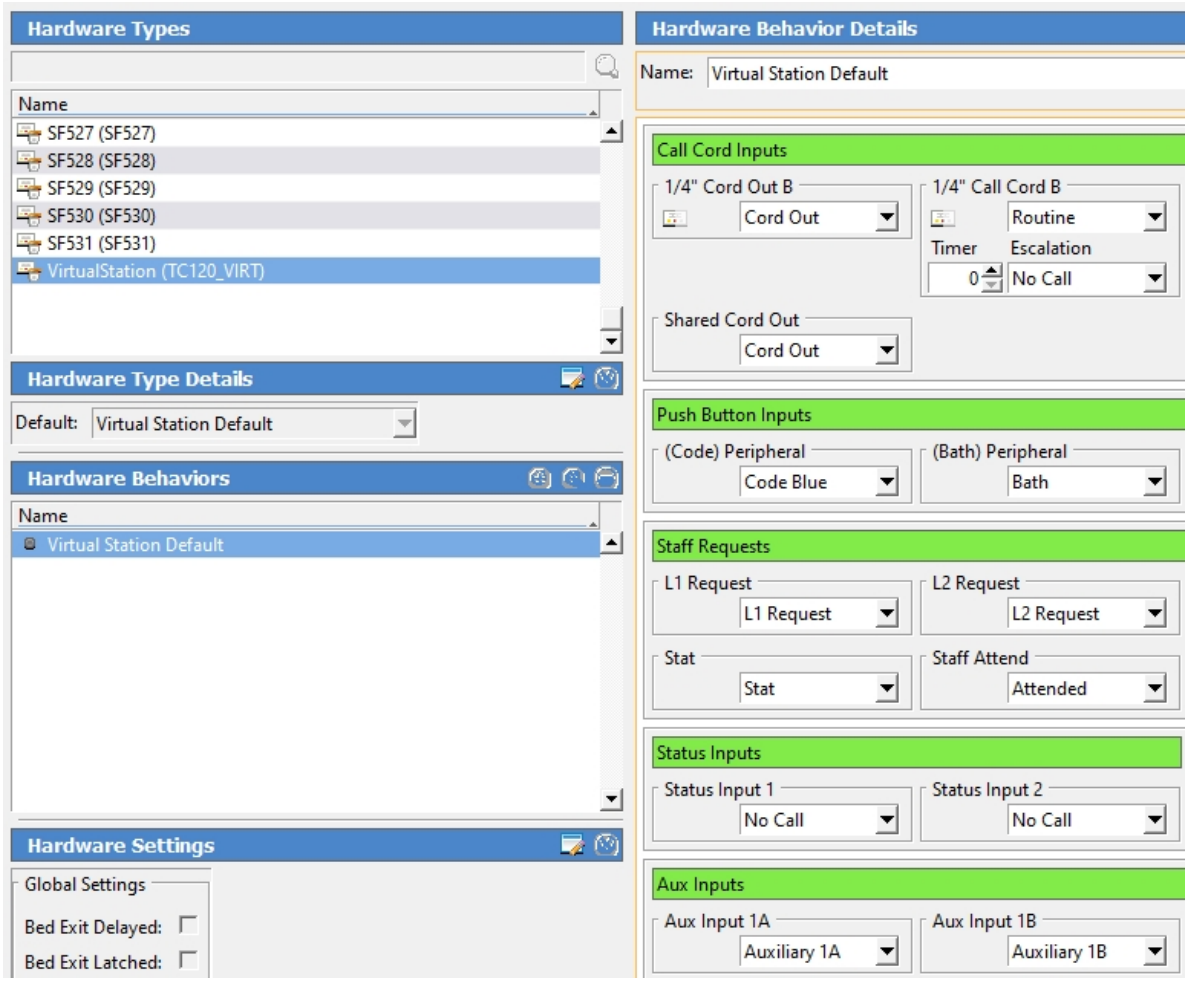
Note that any changes made to the **Virtual Station Default** behavior are global.

Click **Apply** once all edits are made.

If a single Station ID on the system requires different call types, create a copy of the **Virtual Station Default** behavior using the **Add Copy** button in the **Hardware Behaviors** pane. Choose a new name for the hardware behavior and edit the call types as desired. Click **Apply** to save the new hardware behavior.

To assign the new behavior to a Station ID, click **Stations** in the page selection pane. Select the Station ID that the new hardware behavior is to be assigned to and click the **Edit** button in the **Details** pane. Select the hardware behavior to be assigned to the station from the Behavior: drop-down list and click **Apply**. Calls generated by the Station ID that was edited will now generate call types according to the assigned hardware behavior.

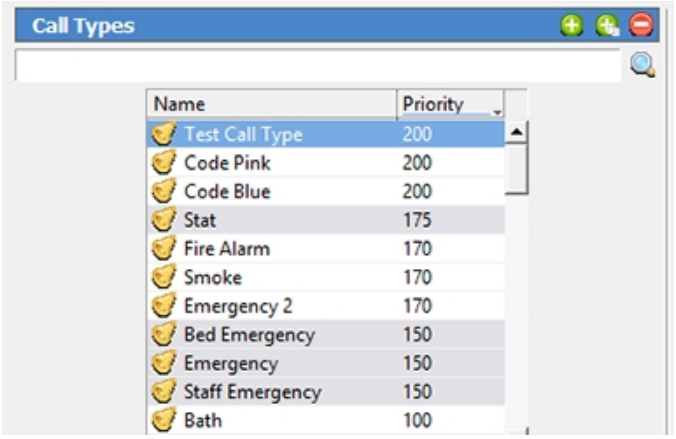
Figure 23 - Behavior Details



Edit Call Types

For most installations, the standard call types will not require editing. However, installations utilizing LI122UN dome lights must modify any call types used in the facility to ensure proper annunciation.

Figure 24 - Call Types List



Select the call type to modify from the **Call Types** list shown above and click the **Edit** button.

Figure 25 - Dome Light Color Selection

In this section, the Blue selection determines the flash rate of the blue LED on all LI122UNs. The Red selection determines the flash rate of the red LED on all LI122UNs. In this example, we are editing the dome light annunciation for the Emergency call type. Note that the settings shown above would result in a medium flash rate on the red LED of LI122UNs zoned to display the Emergency call, however, any LI122UNs zoned to display the call would not annunciate the Emergency call, since the selected flash rate is **Off**.

Choose the appropriate annunciation settings for the selected call type and click **Apply**. Choose **File>Save Configuration** before proceeding.

> ***Note*:** If dome light annunciation colors are altered, perform a careful walk-through test of the dome light annunciation to ensure that the correct lights illuminate for the desired call.

Audio Adjustments

Once installation and configuration are complete, adjustments can be made to change or improve the volume and quality of the audio on the Tek-CARE160 system.

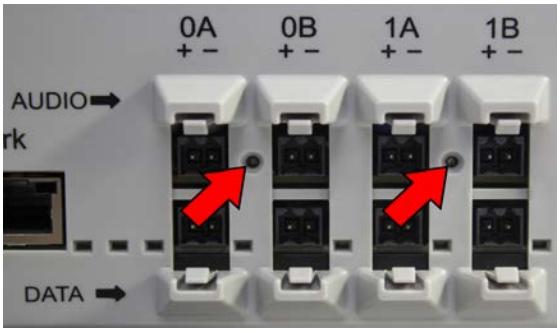
There are basically three adjustments that can be made by installers to affect the audio of the system. Speaker volume and microphone gains can be adjusted for each station using the LS450 Config Tool software, and there is an audio trim pot for each audio bus port.

Audio Trim Pot

The audio bus of the Tek-CARE160 system, like any other audio system, 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. There is one trim pot per audio bus port. They are illustrated below.

Figure 26 - Audio Trim Pots



- Connect an NC415AV directly to the NC160 CE module using a short patch cable. You must be able to reach both the NC160 CE module and the NC415AV Master Station at the same time during this procedure.
- Dial a Station ID that is connected to **Port 0** from the NC415AV Master Station, and establish an audio connection using the **Talk** button, not the handset, of the NC415AV.
- 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 NC415AV.
- Using your 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.
- With the potentiometer fully clockwise, you may hear a considerable amount of background and data noise on the open audio channel. This is normal.
- Begin turning the potentiometer counterclockwise. After six full rotations, the potentiometer will be in the center of its travel.
- Make small clockwise and counterclockwise adjustments to the potentiometer while listening to the audio connection. Too far clockwise, and you will induce noise on the audio bus. Too far counterclockwise, and you will induce noise.
- 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 NC415AV Master Station. Repeat the process outlined above while adjusting the audio trim potentiometer for Port 1 of the NC160 CE module.

Station Volume and Gain Adjustment

Before adjusting the volume and gain of a station, perform a complete system test and check the audio quality of each room. This will require two people, one in the room, and one at a master station.

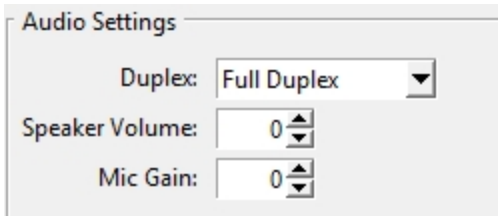
- Place a call from the room, and answer the call at the master station, either with the handset or the push-to-talk button.
- Once the call has been answered, have a brief conversation between the room and the master station. If the IR160 in the room produces adequate volume, and the return audio from the station is satisfactory at the master station, continue with the test.
- If audio is too quiet in the room, note the station ID before moving on so that it can be adjusted later. The volume of the IR160 is controlled by the **Speaker Volume** setting in the config tool.
- If audio from the station is too low at the master station, try turning the volume up on the screen of the master station. If the audio is still too quiet, note the station ID. We can edit the **Mic Gain** setting in the Config Tool to improve audio in this direction.
- Continue the walk test of the facility, and note any problem areas for adjustment.

Once all of the stations have been tested for audio volume, we can adjust them as needed using the LS450 Config Tool software.

Start the software on your laptop that is connected to the NC160 CE module, and select **Load Configuration from System** at the splashscreen. The configuration you set up earlier should open.

Once the configuration is loaded, select the **Stations** page in the Config Tool. Select the Station ID you wish to edit, and click the **Edit** button in the **Details** pane to unlock it for editing.

Figure 27 - Station Audio Adjustment



On the far right of the **Details** pane, note the **Audio Settings** section.

Disregard the **Duplex** setting. It is not used on the Tek-CARE160 system.

To affect the audio in the room, adjust the **Speaker Volume** up or down.

To affect the sensitivity of the IR160 microphone, adjust the **Mic Gain** up or down.

Make small, incremental changes to the values as needed. Once the changes have been made, select the **Apply** button, choose **File>Save Configuration** and then **File>Commit Configuration** to System to write the changes to the system.

Once the changes have been committed, test the station audio again, and if needed, adjust further.

Repeat this process for any other Station IDs that require audio adjustment.

Using the Tek-CARE160 System

Placing and Resetting Calls

Residents may place calls on the Tek-CARE160 system by pressing the **CALL** button on SF121 and SF122 stations, or by pulling the call cord or pressing the **CALL** button on a SF123 station. Third party contacts attached to PM123 Aux Input Modules also trigger calls. When a call is placed, the red LED on the face of the station will flash.

When a call is placed, the call annunciates on the LI122UN Room Controllers, master stations, multicolor zone lights, mobile devices, or other annunciation locations to which it is assigned.

To talk to the station that placed the call, simply lift the handset and begin speaking. If you wish to use the push-to-talk feature of the NC415AV, press and hold the **TALK** button on the NC415AV Master Station. Release the **TALK** button to listen. Picking up the handset will automatically answer the first call in the list. If more than one call is displayed, touch the call you wish to answer to select it before lifting the handset or pressing the **TALK** button.

Depending on system programming, some low-priority calls can be silenced or reset from the master station. If this option is available on your system, the gray buttons on the right side of the NC415AV housing are used. The buttons are labeled accordingly.

Please refer to IL1068 Tek-CARE Master Station User Guide fore more information and further instruction on how to use the various master stations for the Tek-CARE System.

DIP Switch Address	
Module Address	
Port	

Point	Default Station ID	Custom Station ID	Hardware	Function
1				
2				
3				
4				
5				
6				
Red -or- Blue LED			Red -or- Blue	Standard -or- Zone
White LED			White	Standard -or- Zone

DIP Switch Address	
Module Address	
Port	

Point	Default Station ID	Custom Station ID	Hardware	Function
1				
2				
3				
4				
5				
6				
Red -or- Blue LED			Red -or- Blue	Standard -or- Zone
White LED			White	Standard -or- Zone

DIP Switch Address	
Module Address	
Port	

Point	Default Station ID	Custom Station ID	Hardware	Function
1				
2				
3				
4				
5				
6				
Red -or- Blue LED			Red -or- Blue	Standard -or- Zone
White LED			White	Standard -or- Zone

DIP Switch Address	
Module Address	
Port	

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1				
2				
3				
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5				
6				
Red -or- Blue LED			Red -or- Blue	Standard -or- Zone
White LED			White	Standard -or- Zone

DIP Switch Address	
Module Address	
Port	

Point	Default Station ID	Custom Station ID	Hardware	Function
1				
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5				
6				
Red -or- Blue LED			Red -or- Blue	Standard -or- Zone
White LED			White	Standard -or- Zone

DIP Switch Address	
Module Address	
Port	

Point	Default Station ID	Custom Station ID	Hardware	Function
1				
2				
3				
4				
5				
6				
Red -or- Blue LED			Red -or- Blue	Standard -or- Zone
White LED			White	Standard -or- Zone