# NC Series

## Nurse Call Communication System

## Planning and Installation Manual

### BENEFITS
- Reliable Signaling
- No Maintenance
- Low Power
- Simple Wiring
- Easily Integrates with other Systems
- Attractive Station Hardware
- Super Bright
- Wide Angle Corridor Light

Based on more than 30 years of design and development, Tech Works Nurse Call systems enable any new or existing facility to integrate all of the features and benefits of digital communications technology, without the need for expensive rewiring and configuration.

By implementing a simple, legacy-compatible wiring system, Tech Works has achieved the ultimate in competitive performance. Designed from the ground up to provide the ultimate in reliability and performance, Tech Works NC systems are designed to easily install and operate over existing wiring, or via economical CAT5 cable. Easily and seamlessly integrating with existing systems, Tech Works NC systems' low power circuitry is economical and virtually maintenance free.

With a wide variety of patient station and annunciator / call reporting options, and the brightest, most reliable dome lights available, Tech Works NC systems can be custom configured from a single station to a fully integrated 256-station system with computer oversight.

## Design Information

Power
   24 VDC

Mechanical
   Standard Electrical Box rough-in

Station wiring –

   3-conductor circulating + one conductor home to central equipment from each room.
   Or
   A single CAT5 home run from each room.

## Tech Works ®

*"Making Specialized Communication Easy"*

# How to use this Manual

Those wishing to use one of the standard **Configuration Templates,** should first read the *Overview*, and then proceed to the appropriate **Configuration Template** for your application**.** The *Setup* and *Adjustments* section should also be read before installation.

For those users who wish to do their own engineering, all sections may be useful. You may also wish to contact a **Tech Works** application engineer for assistance.

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# List of Illustrations:

**Overview**

When you are looking for is a simple reliable solution for traditional Nurse Call, you can look to Tech Works for the universal solution. Our new NC series is based on over 30 years of building and installing products by various manufacturers. The NC series was designed from the ground up to provide reliable performance, with digital integration. Providing the best of both worlds, by reusing most existing wiring systems while integrating to digital technology to give the user options they only get with new systems.

Using a simple wiring system, which is similar to most legacy nurse call systems, Tech Works has achieved the ultimate in competitive performance. With a variety of patient station options and annunciator / call reporting options, and the brightest most reliable Dome Light available, you can build a system from as small as one station with a standalone Dome Light to a fully integrated 256 station system with computer activity reporting. And you get all this with a minimal amount of wiring, and in most cases you don't need to pull any wire in existing facilities.

The key is in the Dome Lights. Each Room has a Corridor Dome Light, with one or more Pull Stations or Patient Bed Stations. The Dome Light is the central tie point for the Room, with wiring going to the Call Stations and optionally to the Central Control Module and System Power Supply. A Room may "Stand Alone" or provide Central Reporting, with Nurse Stations having one or more Tone Visual Annunciator Panels or other reporting products.

This design may be used in new systems using standard CAT5 computer cable and in Legacy Systems by repurposing existing wiring. . In Legacy systems having a circulating 3-4 conductor power buss with a single conductor home run to the "Central Unit" to Mirror the Corridor light function at the annunciator, the basic NC-DL-12-RSCT Dome Light has everything needed to connect to the old wire and provide full features of a single color, two call system. The NC-DL-12-RCST may also be used in newer Designs where CAT 5 or CAT6 cable has been home run from each room. When 2 colors per room are preferred The NC-DL-22-RW Dome Light is available with Red for Emergency Call and White for a Normal Call.

The basic architecture of the NC-Series Nurse Call system is; a passive Room Station signals an active Dome Light. The dome then turns a contact closure into a variable Current Loop signal to a Control Module. The Control Module then interprets the Current Loop from the room as a status of:
* Trouble, meaning something is wrong with either the station or the wire
* Off, meaning everything is fine but there is no activity at the room
* Normal Call, a station like a Bed Station or Staff Presence Station is Active
* Emergency Call, a station like a Bath Station or a Staff Assist Station is Active
* Code Call, a station like the Code Blue Station
* Cancel, meaning staff has attended to the room condition and canceled the call

Once the Control Module has interpreted these signals, the room status is converted into digital communication and set out over the Addressable Tech Works Network to other Tech Works stations such as Annunciators or data bridges to other technologies such as Pocket Page, SMS messaging, or the Tech Works Integrated Messaging and Reporting System.

A variety of standard Tone Visual Annunciator Panels are available for remote indication of calls and system status. Standard models include 16 Rooms and 32 Rooms wall displays. By adding secondary products, system calls can be sent to Personal Computers on a network, Smart Phones, and many, many other digital communication devices.

# *Tech Works* NC NURSE CALL SYSTEM WIRING
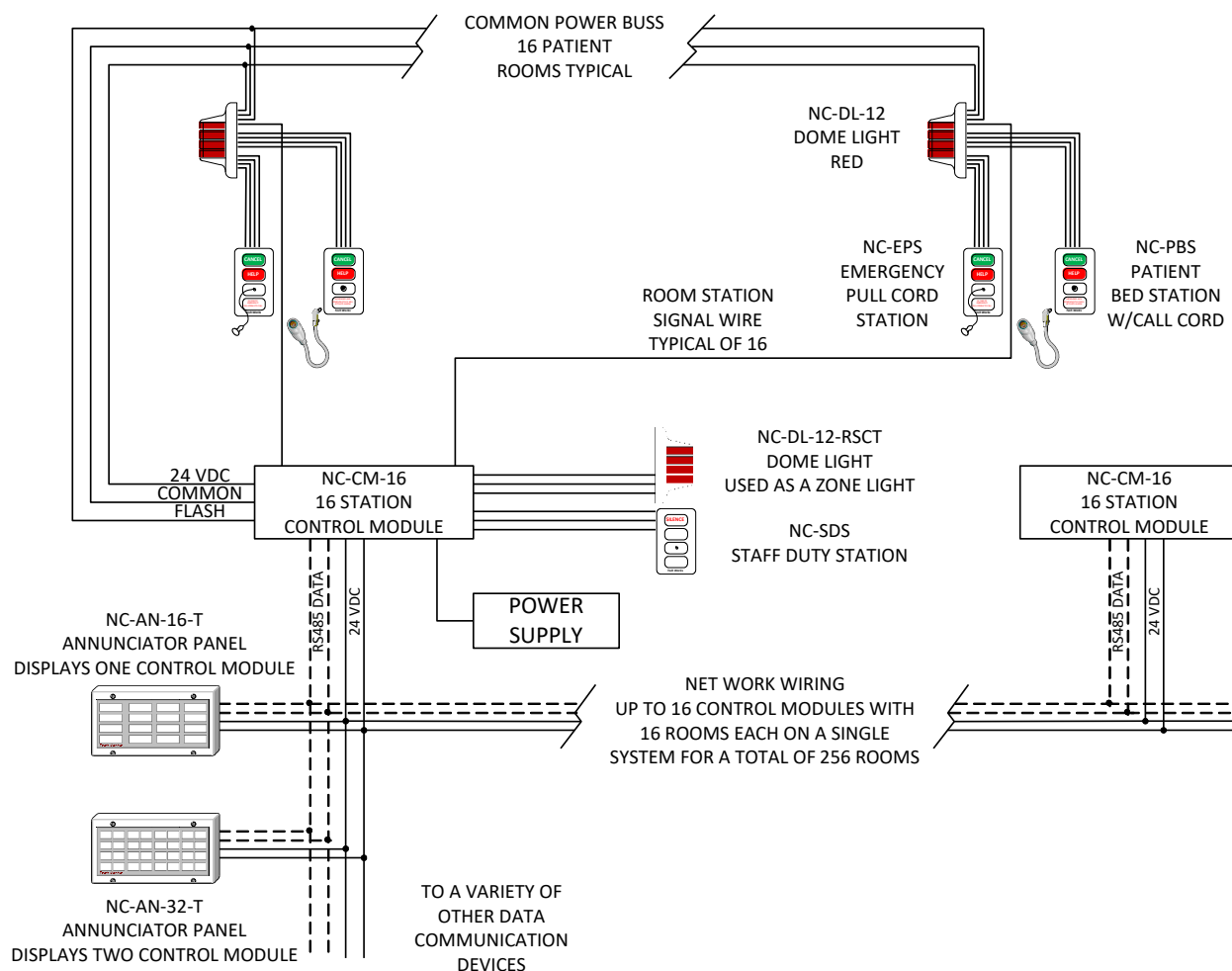


Where legacy wire needs to be repurposed to a modern Nurse Call System, Tech Works NC is the answer. Older systems used a circulating power buss of 3-4 conductors and a home run wire from each room to a light bulb. The NC-DL-12 and NC-DL-22 Dome Lights uses this wiring system to talk to an NC-DM-16 Control Module. The Dome Light sends Room Status to the Central Control Module using the old "Annunciate" wire. The Control Module also provides a System Wide 1Hz Flash Signal to coordinate the Dome Lights Flashing at the same time. The NC-DM-16 then turns the status of 16 rooms into an addressable digital RS485 Tech Works Network for communication with other Tech Works Network products such as Annunciators, Pocket Page Systems, and our Integrated Messaging and Reporting System.

Stations can place either an Emergency or a Normal Call. A Normal Call is indicated by a steady light at the calling station and at the Dome Light while an Emergency Call is indicated by a Flashing Light. An Emergency Call is of higher priority than a Normal Call so if both are active at the same time on an individual Dome Light the Light will be flashing to indicate the Emergency until that call is Canceled. Calls must be cancelled from the Originating Station. The NC-DL-12-RSCT Dome Light has a built in tone unit which can be disabled. The Tone will sound once for a Normal Call and is repeating with an Emergency Call until the call is Canceled.

**System Parameters**

The Dome Light is the Central Tie point for the Room, with wiring going to the Call Stations and optionally to the Central Control Module and System Power Supply.
The NC-DL-12 and DL-NC-22 Dome Lights support two types of Calls:
        N-Call, Normal Call
        E-Call, Emergency Call
        C-Call, Code Call
        N-CALL = Bed Call and E-CALL = Bathroom Call and C-Call = Operating Room Call
    The Indication is:
        Off, when there are no calls
        On Steady, if there are only Normal-Call's (N-Call)
        On Flashing, if there is an Emergency-Call (E-Call)
        On Super Fast Flashing, if there is a Code Call (C-Call
    The Call Stations have:
        Momentary Switches that are latched in the Dome Light
        Confirmation Indicators
        Beep if the optional Tone unit is installed such as the NC-DL-12-RSCT

With only three wires, Call Stations may Assert and Cancel only one type of Call; two Switches, connected as either an N-CALL or E-CALL Call Station.
With four wires, they may Assert and Cancel both types of Calls; three Switches
Up to four, Call Stations may be connected in Parallel
Calls must be cancelled from the Dome Light Station Port where the Call was originated
If Stations are connected in Parallel then Calls may be made, or Cancelled from any Parallel Call Station.
Calls may be asserted from either Station or both Stations simultaneously
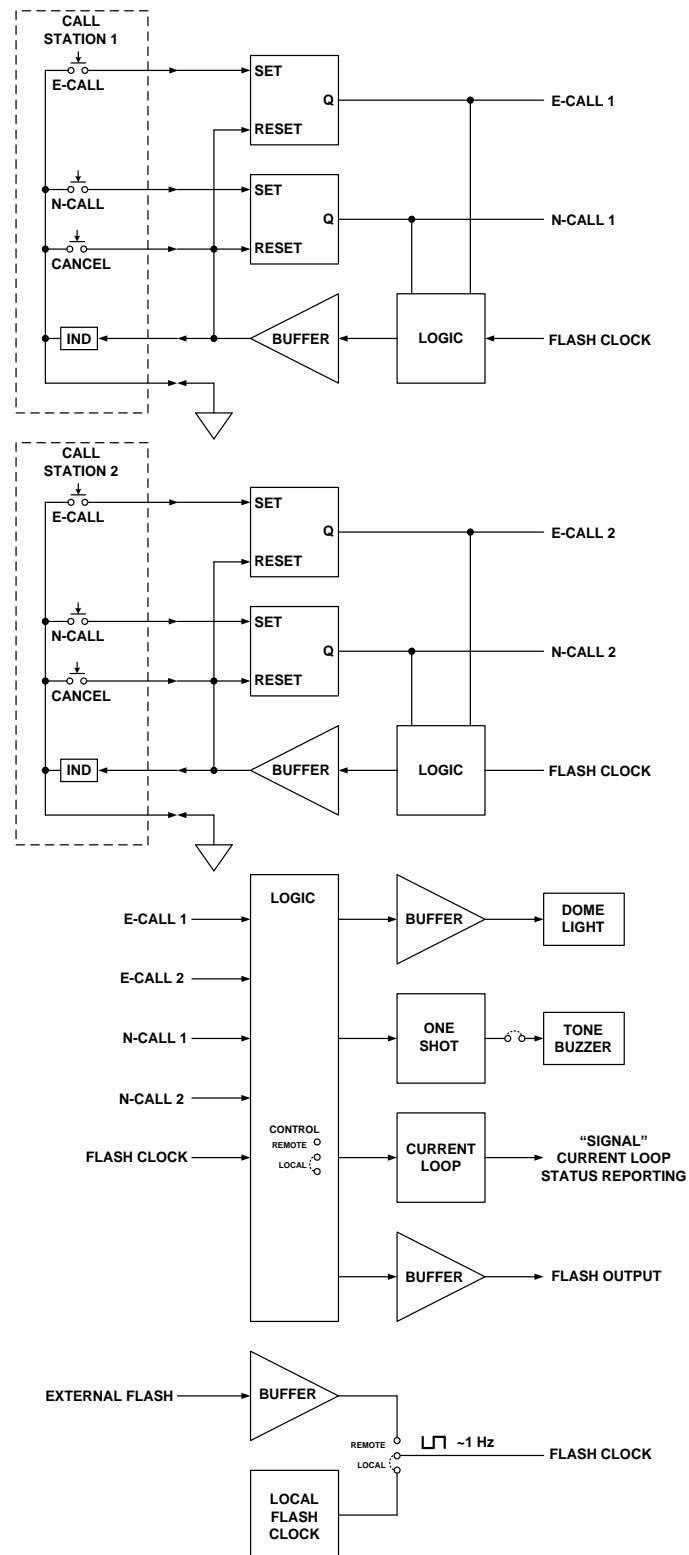The Dome Light will only turn off, when calls are cancelled at both Call Stations
For Systems with Central Reporting, the NC-DL-12 and NC-DL-22 use Current Loop reporting to the NC-CM-16, Control Module Unit.

Up to 16 of the NC-DM-16 Control Modules can work together on a typical Tech Works Network. This gives a system capacity of 256 individual rooms on a single system. Each Control Module is addressable using a built in rotary switch. Each of the 16 room inputs can be supervised to make sure that the wire to the room is in proper working order. Supervision can be turned off if not desired. If a 16 point controller is not fully utilized, the un-used signal lines can be place "Out Of Service" by setting a dip switch associated with that point.

A Zone Light or Staff Duty Station can be provided from any NC-CM-16 Control Module. Dip Switches allow the selection of any Call point to be sent to each of two "Zone" outputs per Control Module. The Zone outputs on the NC-CM16 is a 3 wire connection that can be sent to an NC-DL-12-RSCT Dome Light acting as a Slave to provide a Zone light representing a group of Dome Lights or to an NC-SDS Staff Duty Station to sound a tone and give a visual call indication in remote staff locations. With a 4 wire connection a 2 color dome light like the NC-DL-22C-BW can be a 2 color Zone Light.

Annunciators are available in 16 and 32 point light arrays with an associated Tone. These units are addressable on the Network to represent 1, 2 or 4 Control Modules and their associated rooms. Labeling is easy with a simple paper insert that allows the installer to use any PC and printer to place the letters directly over the light. When a room is active the corresponding lights light up behind the paper and shine through the lettering you place for each room.
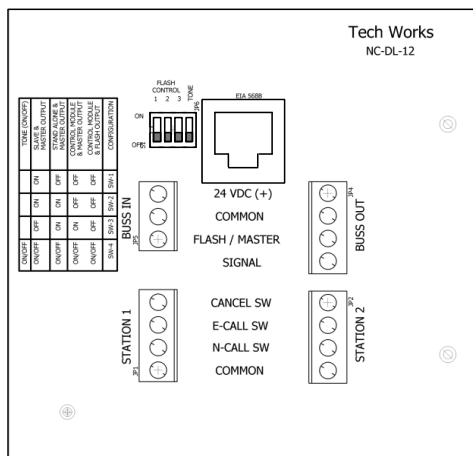
**Patient Room Functional diagram:**



**NC_DL_12 (Shown Configured as a Stand-Alone Master) Simplified Block Diagram**

### NC-DL-12-R, B, or W

The NC-DL-12-R is a 1 color, 2 input stylish Dome Light capable of standalone installation. All units have Red Lights with screw terminal wiring connections to two Call Stations.

**NC-DL-12-RSCT** Is the All Options Included model and has screw terminal wiring connections plus a CAT5 connector for wiring to a Control Module. It also includes a built in Flash module for Stand-Alone operation and a Tone unit to make a beeping sound when the station is active.

There are several **options** available for the **NC-DL-12** including a 2K tone generator, with sound output of 75dB SPL at 4 feet in the front and 70dB SPL on the sides, and optional connectors. Order with the designated part numbers below:

    **NC-DL-12-(X)SCT**    (X=COLOR), Screw Terminals, CAT5 Connector, Tone
    **NC-DL-12-(X)C**      (X=COLOR), CAT5 Connector

### Connectors & Configuration Dip Switches:

Connections use Barrier Strips on the back of the Dome Light. 24Volt Power, Common and Flash Clock are Buss signals, The Signal output is a dedicated wire to the Control Module



### Buss In & Out:

These connectors are used to tie the Dome Light to Power, the Control Module, and other stations when used in a Master Slave arrangement.

The first three lines are in Parallel for wiring Convenience

The "Signal" Output Line is a single wire connecting to the, NC-CM-116, Control Module. This wire tells the control module the status of the dome light.

When used as a Master/Slave configuration; the "Master" Dome light connects to the Buss, and Stations. The "BUSS OUT" Connects to the "BUSS IN", of the Slave or secondary Dome Lights

The Slave Dome lights have no other Connections

*See the Application section for setup*

### RJ-45 Connectors:

When wired using CAT5/6 type cable, all Power and Signal connections are made in the single connection. There is no need for connecting to the Buss or Signal screw terminals
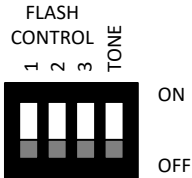
### Station 1 & Station 2:

Connections to the, NC-EPS, Pull Stations, PBS, Patient Bed Stations, or other station types.

**Dip Switch Options:**

The NC-DL-12 is available in 3 versions. Only the NC-DL-12-RSCT stand alone version has the functional Option Dip Switches and Tone unit. The function of the Dome Light is configured with Dip Switches.

**Central Control System:**

This unit connects to the NC-CM-16 Control Module by a CAT5/6 home run or Power and Flash Buss, using 3 circulating conductors and a "Signal" wire home run to the NC-CM-16

The Flashing is coordinated by the NC-CM-16, Control Module; all Dome Lights flash together

Tone can be On or Off as desired.

**Flash Control:**
Configures the operation of the Dome light, Common Configurations are shown
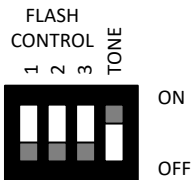
**Stand-Alone Master:**
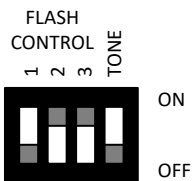
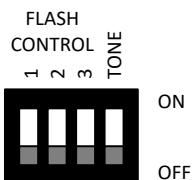This Unit connects to the Call Stations, and provides the Flash Clock

**Stand-Alone Slave:**
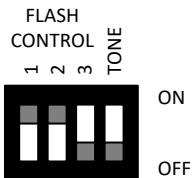
This Unit connects to the Master Dome light
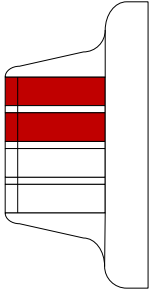
**Tone Buzzer:**

**ON**, Tone sounds briefly when a Normal Call is placed,
Tone sounds repeatedly, 1 CPS rate, when Emergency Call is present

**OFF**, no Tone sounds

**NC-DL-22-RW**

The **NC-DL-22-RW** is a 2 color, 2 input stylish Dome Light for installation in systems using central control modules and supports Normal Calls and Emergency Calls. The Control Module also supplies Power and Flash synchronization for up to 16 Dome Lights.

When no calls are originating from a room, the Dome Light is Off. When a "Normal Call" is placed, the Dome Light illuminates the White Light On steadily. When an "Emergency Call" is pending, the Red Dome Light flashes. Calls must be cancelled from the Station where the Call was originated. The Dome Light will only turn off when calls are cancelled at both Call Stations.

The **NC-DL-12-RW** is equipped with both screw terminals and an RJ45, CAT5 connector for installation convenience. All units are equipped with screw terminal wiring connections to two Call Stations.

**Connectors:**
Connections use Barrier Strips on the back of the Dome Light. 24 Volt Power, Common and Flash Clock are Buss signals, The Signal output is a dedicated wire to the Control Module
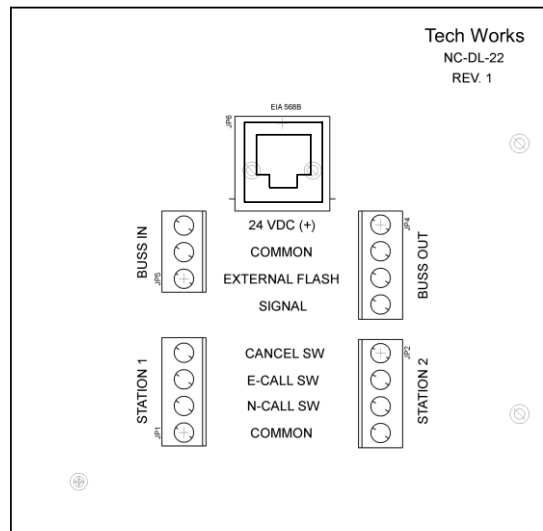


**Buss In & Out:**
These connectors are used to tie the Dome Light to Power and the Control Module
The first three lines are in Parallel for wiring Convenience
The "Signal" Output Line is a single wire connecting to the, NC-CM-116, Control Module. This wire tells the control module the status of the dome light.
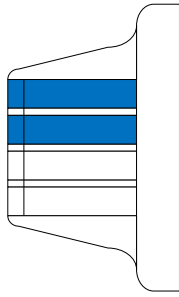
**RJ-45 Connectors:**
When wired using CAT5/6 type cable, all Power and Signal connections are made in the single connection. There is no need for connecting to the Buss or Signal screw terminals

**Station 1 & Station 2:**
Connections to the, NC-EPS, Pull Stations, PBS, Patient Bed Stations, or other station types.

### NC-DL-22C-BR or BW



The **NC-DL-22C-BW** is a 2 color, Blue/White(BW) or Blue/Red (BR), 2 input stylish Dome Light for installation in systems using central control modules and supports Normal Calls and Emergency Calls. The Control Module also supplies Power and Flash synchronization for up to 16 Dome Lights.

The **NC-DL-22C-BW and BR** are specifically designed for Code Blue compliance in signaling and supports Normal Calls, Emergency Calls, and Code Calls with 3 distinct light and signal outputs. When no calls are originating from a room, the Dome Light is Off. When a "Normal Call" is placed, the Dome Light illuminates the Red or White Light On steadily. When an "Emergency Call" is pending, the Red or White Dome Light flashes at 1 Hz. When a "Code Call" is pending, the Blue Dome Light flashes at 2 Hz. Calls must be cancelled from the Station where the Call was originated. The Dome Light will only turn off when calls are cancelled at both Call Stations.

The **NC-DL-12-BW** is equipped with both screw terminals and an RJ45, CAT5 connector for installation convenience. All units are equipped with screw terminal wiring connections to two Call Stations and a 2nd dome light.

**Connectors:**
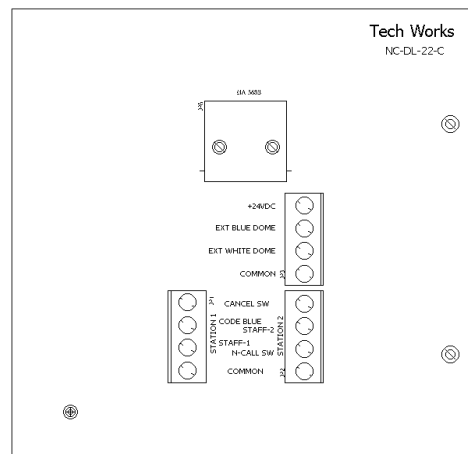


### RJ-45 Connectors:
All Power and Signal connections are made in the single RJ45 connection.

### Dome Light Extender
To allow easy parallel of 2 dome lights, a light extender connector is provided. Simply parallel a second NC-DL-22C to the main room dome light by running 4 wires from one dome light to a 2nd dome light. Connect +24VDC to +24VDC, EXT Blue to EXT Blue, EXT White to EXT White, and Common to Common.

### Station 1 & Station 2:
Connections to the, NC-CBAS, Code Blue Stations, PBS, Patient Bed Stations, or other station types. Code Blue and Staff Assist on Station 1 connector and N-Call or Bed and Staff Assist on Station 2.

**Stations:**

All Tech Works Call Stations include an integral call confirmation or Assurance LED which tells the user a Call or Alert has been sent. The Call Assurance Light will be Off if no call is pending, On steady if a Normal Call is pending, and On Flashing if an Emergency Call is Pending.

These are passive button and light assemblies designed for use with active stations like the **NC-DL-12-R** or NC-DL-22-RW Dome Light. Screw Terminals provide wiring connection to the active electronic stations that provide signaling and control for the **NC-PBS**.

Mounting is a standard 1-gang electrical box. An integral back plate provides mounting and adaptor alignment for the **NC-PBS**.

The Call Station and System Configurations are very flexible. One or both Call Station Inputs may be used. A Call Station may have One Two or Three Switches used. Call Stations may be connected in Parallel. Call Stations may be configured, so only some of the Switches are connected in parallel.

Many Configurations are possible; if the ones shown below do not fit your needs; please contact us.

Wiring Connections
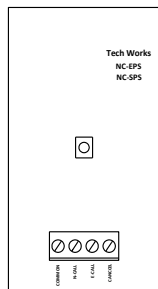
Tech Works Call Stations all share the same connections and interface. The difference between the stations is just buttons and labeling to perform different functions. If a station is only intended to provide a Normal Call then, that is the only Call wire required along with the Common and Cancel wires. Most Tech Works stations are capable of providing both a Normal and an Emergency Call signal so it is recommended that all 4 wires be connected between the Dome Light and all Call Stations. The 4 wires from the Control Module to each station are Common, Normal Call, Emergency Call, and Call Cancel. These four wires can be paralleled to up to 4 stations if necessary. However, when multiple stations are paralleled, they share the same Cancel. This means that cancelling a call at one station cancels the call at all stations on the wire. This may be acceptable but then again it may be a code violation. Please check all building codes and standards before installing.

**NC-CBAS Code Blue plus Staff Station**
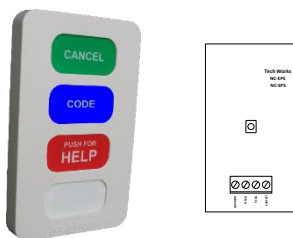
The Tech Works **NC-CBAS** is a Code Blue Station with a Staff Assist Help Button in a semi-flush ABS plastic enclosure for durable emergency signaling. A "CODE" button generates a light signal to notify staff that Emergency Help is needed in a room. A convenient Staff button is also included for activating the Local Staff Call directly at the station. A distinctive "CANCEL" button is provided to reset the station.

## NC-CBS Code Blue Station
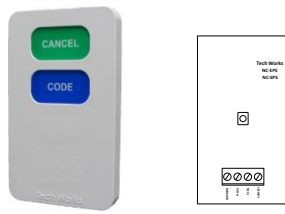
The Tech Works **NC-CBS** is a Code Blue Station in a semi-flush ABS plastic enclosure for durable emergency signaling. A "CODE" button generates a light signal to notify staff that "Code" Help is needed in a room. Staff is provided with a distinctive "CANCEL" button to reset the station.
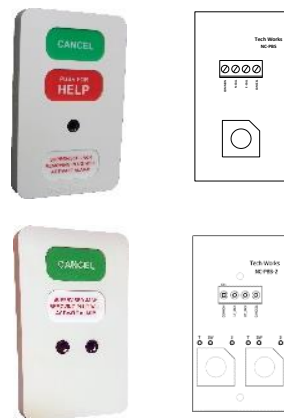
## NC-EPS and NC-EPS-WP Emergency Pull Station
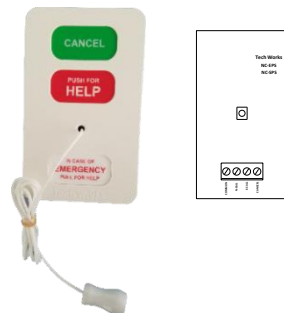
The Tech Works **NC-EPS** is an Emergency Pull Station in a semi-flush ABS plastic enclosure for durable emergency signaling. A braided nylon pull cord provides the patient with convenient call for help when they may not be able to reach the station. A convenient Push for Help button is also included for activating the Call directly at the station. Staff is provided with a distinctive "CANCEL" button to reset the station.

The **NC-EPS-WP** is also available with foam gasket on the back to seal it to a wall when installed in high moisture environments. The **NC-EPS-WP** is for use adjacent to areas like showers but is not intended for submersion in water.

## NC-PBS-1 and 2 Patient Bed Station

The Tech Works **NC-PBS-1** is a Single Patient Bed Station in a semi-flush ABS plastic enclosure for durable emergency signaling. A ¼" phone jack provides a supervised connection for a Call Cord like the **PBC-7**. The Call Cord provides the patient with convenient call for help when they may not be able to reach the station. A convenient Push for Help button is also included for activating the Emergency Call directly at the station. Staff is provided with a distinctive "CANCEL" button to reset the station.

The Tech Works **NC-PBS-2** is a Dual Patient Bed Station in a semi-flush ABS plastic enclosure for durable emergency signaling. Two ¼" phone jacks provide a supervised connection for Call Cords.

## Call Cords
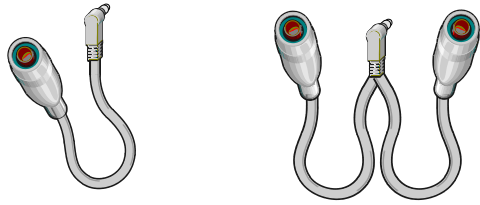
The Tech Works **PBC** Push Button Call Cords are made of high impact thermoplastic with a flexible white cord and right angle 1/4 inch phone plug. These cords are designed to provide remote push button operation from the **NC-PBS** Patient Station by simply plugging it into the jack. The button is a non-locking normally open contact passive assembly. The cord set comes with a security clip and is completely shock and waterproof for use in sterile environments**.**

The **PBC-7** is a single Call Cord, 7 feet long. The **PBC-2-12** is a Dual Call Cord, or Y Cord with two push buttons hooked to a single jack by 12 foot cords. This is designed to allow two beds to share a single Patient Station.

## NC-SAS Staff Assist HELP Station
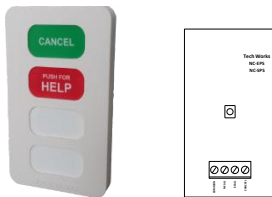
The Tech Works **NC-SAS** is a call for HELP Station in a semi-flush ABS plastic enclosure for durable emergency signaling. A convenient Push for Help button is provided for activating the Emergency Call directly at the station. Staff is provided with a distinctive "CANCEL" button to reset the station.

## NC-SPS Staff Presence Station
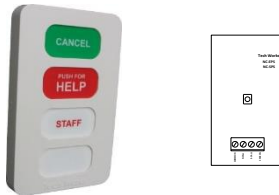
The Tech Works **NC-SPS** is a Staff Presence Station in a semi-flush ABS plastic enclosure for durable emergency signaling. A "STAFF" button places a Normal Call of Steady Light Signal to let staff know that someone is in a room. A convenient Push for Help button is also included for activating the Emergency Call directly at the station. Staff is provided with a distinctive "CANCEL" button to reset the station.

## NC-SDS Staff Duty Station

The Tech Works **NC-SDS** is a Staff Duty Station in a semi-flush ABS plastic enclosure for durable emergency signaling. An integral tone unit makes a beeping sound to alert staff that the system is active. This unit is designed for remote areas like work rooms and other staff areas where staff needs to know that the Nurse Call System is active and needs their attention. Staff is provided with a distinctive "SILENCE" button to turn off the tone while the station is still active.

## NC-CS Cancel Only Station
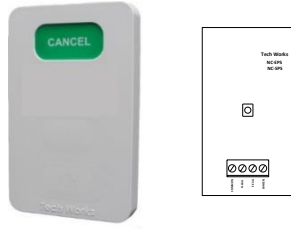
The Tech Works **NC-CS** is a Cancel Only Station in a semi-flush ABS plastic enclosure for durable emergency signaling. This station is intended to be used with our other NC-Series products when a Remote Cancel only button is required to reset a dome light. Staff is provided with a distinctive "CANCEL" button to reset other station.

The Cancel Only button must be located so that anyone pressing it can visually see the station that is to be cancelled to be code compliant.

## NC-VP-CBS          Rugged Code Blue Button
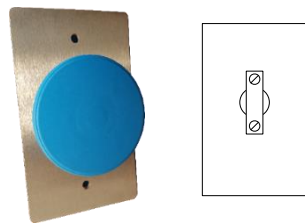
The Tech Works **NC-VP-CBS** is a Code Blue Station with a giant mushroom button mounted on a rugged stainless-steel plate. Anywhere that staff needs to place a Code call but my not be able to use their hands, the **NC-VP-CBS** can be activated using an elbow, knee, or even as a kick plate for foot activation. A "CODE" button generates a light signal to notify staff that "Code" Help is needed in a room. The call Cancel is performed using a separate station with a distinctive lighted "CANCEL" button to reset the station like the Tech Works **NC-CS** or **NC-VP-CS**.

## NC-VP-CS Vandal Proof Cancel Only Station

The Tech Works **NC-VP-CS** is a Cancel only Station with a Vandal Resistant Push button with concentric Call Assurance Light built in to the button and mounted on a rugged stainless-steel plate. This station is intended to be used with our other NC-Series products when a Remote Cancel only button is required to reset a dome light. Staff is provided with a distinctive "CANCEL" button to reset other station that have their own cancel button and are not designed for remote cancel.

The Cancel Only button must be located so that anyone pressing it can visually see the station that is to be cancelled to be code compliant.

## NC-VP-PBS Vandal Proof Patient Bed Station

The Tech Works **NC-VP-PBS** is a call for HELP Station with a ¼ inch call cord jack and a Vandal Resistant Push button with concentric Call Assurance Light built in to the button and mounted on a rugged stainless-steel plate. The call cord jack is provided for activating the Normal or Bed Call directly at the station. Call cancel is a Lighted Button to reset the station. The reset can be either local or a remote NV-VP-CS Cancel Station.
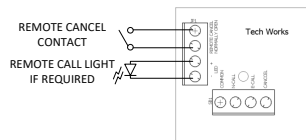
## NC-VP-SAS Vandal Proof Staff Assist Station
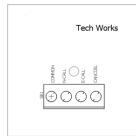
The Tech Works **NC-VP-SAS** is a call for HELP Station with a Vandal Resistant Push button with concentric Call Assurance Light built in to the button and mounted on a rugged stainless-steel plate. A convenient Push for Help button is provided for activating the Emergency Call directly at the station. Staff is provided with a distinctive "CANCEL" button to reset the station.

## NC-VP-SAS-RC Vandal Proof Staff Assist Station with Remote Cancel

The Tech Works **NC-VP-SAS-RC** is a call for HELP Station with a Vandal Resistant Push button with concentric Call Assurance Light built in to the button and mounted on a rugged stainless-steel plate. The Push for Help button is provided for activating the Emergency Call directly at the station. Call cancel is a remote contact to reset the station. The remote reset can be a either a key switch or a matching lighted push button.
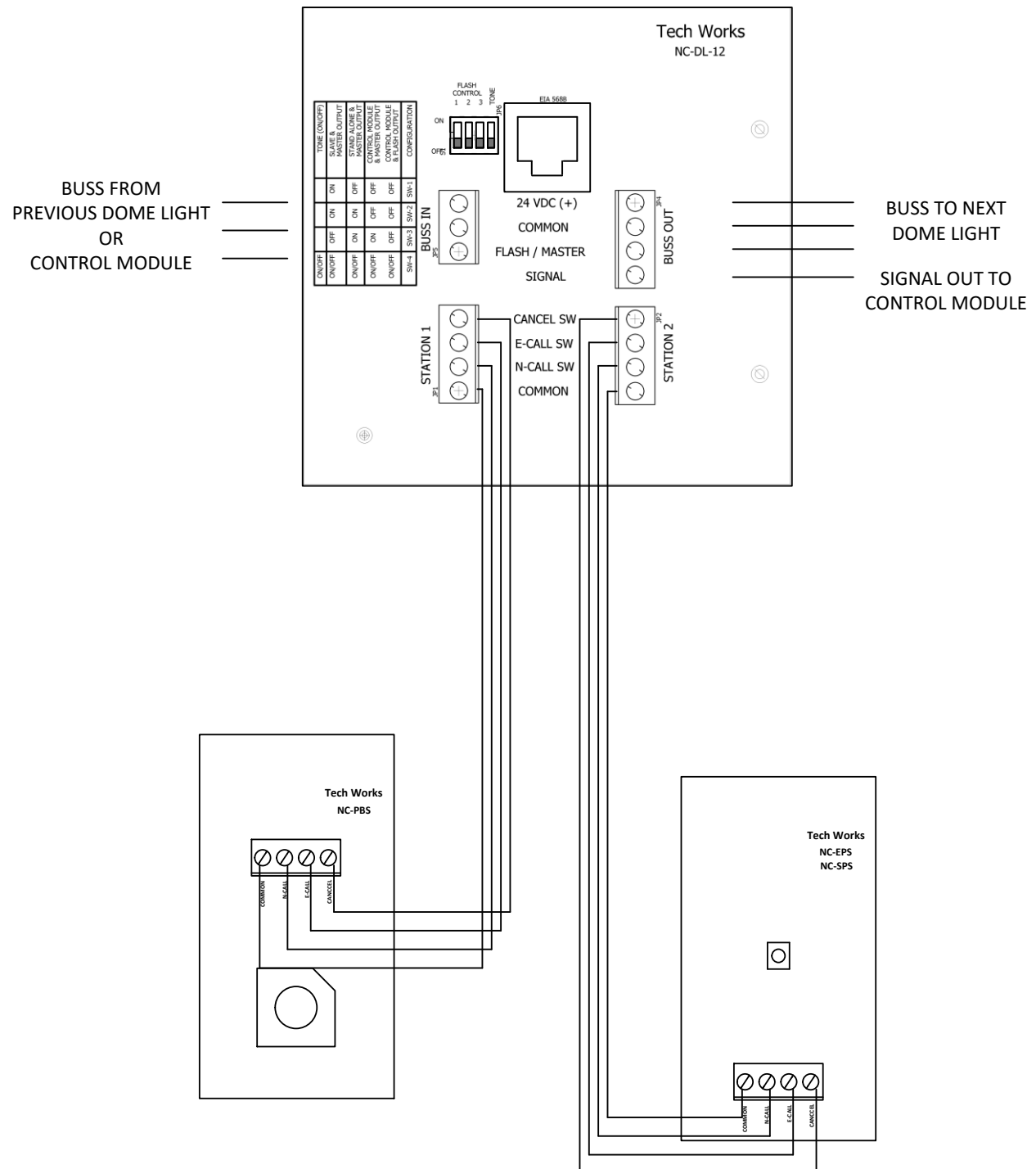
## VPBL-1 Vandal Proof Button with L:ight
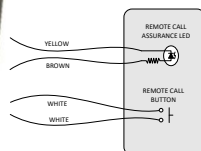
The Tech Works VPBL-1 is a Vandal Resistant Push Button with concentric Green LED Call Assurance Light built in to the button and is specifically designed for the Security industry. With its pre-wired connections, it is easy to install and requires no maintenance. It is perfect for those locations where emergency call for help is required but may be subject to abuse or vandalism.

## VPKS-1 Vandal Proof Key Switch

The Tech Works VPKS-1 is a Vandal Resistant Key Switch station normally used as a remote reset or "Cancel" station on our NC-Series Nurse Call products and is specifically designed for the Healthcare and Security industry. With its pre-wired connections, it is easy to install and requires no maintenance. It is perfect for those locations where call cancel without enter a prison cell is required but may be subject to abuse or vandalism.

## Station wiring to a Dome Light

### NC-DL-12-RSCT



BUSS FROM
PREVIOUS DOME LIGHT
OR
CONTROL MODULE

Tech Works
NC-DL-12

FLASH
CONTROL
1  2  3

EIA 568B

24 VDC (+)

COMMON

FLASH / MASTER

SIGNAL

BUSS IN

BUSS OUT

BUSS TO NEXT
DOME LIGHT

SIGNAL OUT TO
CONTROL MODULE

CANCEL SW

E-CALL SW

N-CALL SW

COMMON

STATION 1

STATION 2

Tech Works
NC-PBS

COMMON    N-CALL    E-CALL    CANCEL

Tech Works
NC-EPS
NC-SPS

COMMON    N-CALL    E-CALL    CANCEL

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

CAT6 TO CONTROL MODULE

Tech Works
NC-DL-12

FLASH CONTROL
1 2 3 — TONE
ON
OFF

EIA 568B

TONE (ON/OFF)
SLAVE & MASTER OUTPUT
STAND ALONE & MASTER OUTPUT
CONTROL MODULE & MASTER OUTPUT
CONTROL MODULE & FLASH OUTPUT
CONFIGURATION

| | ON | | | | SW-1 |
| | ON | ON | | | SW-2 |
| ON/OFF | OFF | ON | ON | | SW-3 |
| ON/OFF | ON/OFF | OFF | ON | ON/OFF | SW-4 |

BUSS IN

24 VDC (+)
COMMON
FLASH / MASTER
SIGNAL

BUSS OUT

STATION 1

CANCEL SW
E-CALL SW
N-CALL SW
COMMON

STATION 2

Tech Works
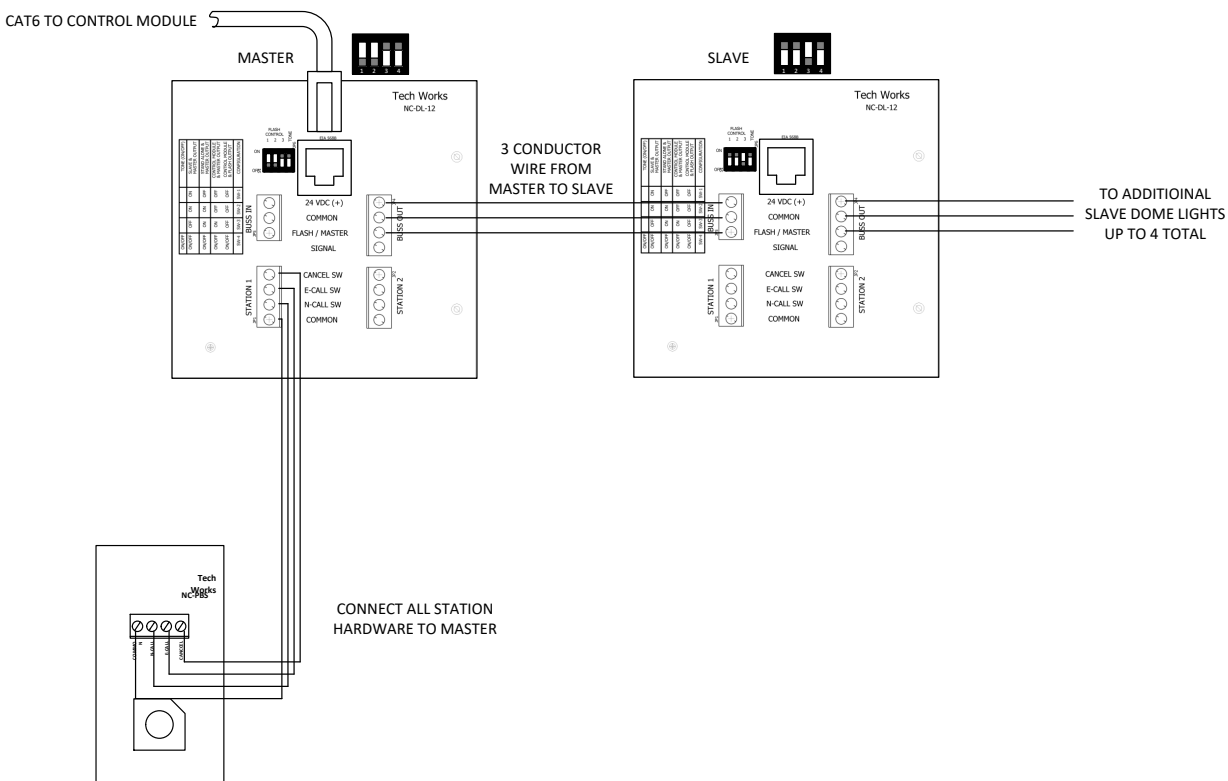
COMMON
N-CALL
E-CALL
CANCEL

CODE STATION          CANCEL STATION

**Vandal Proof Station Wiring**

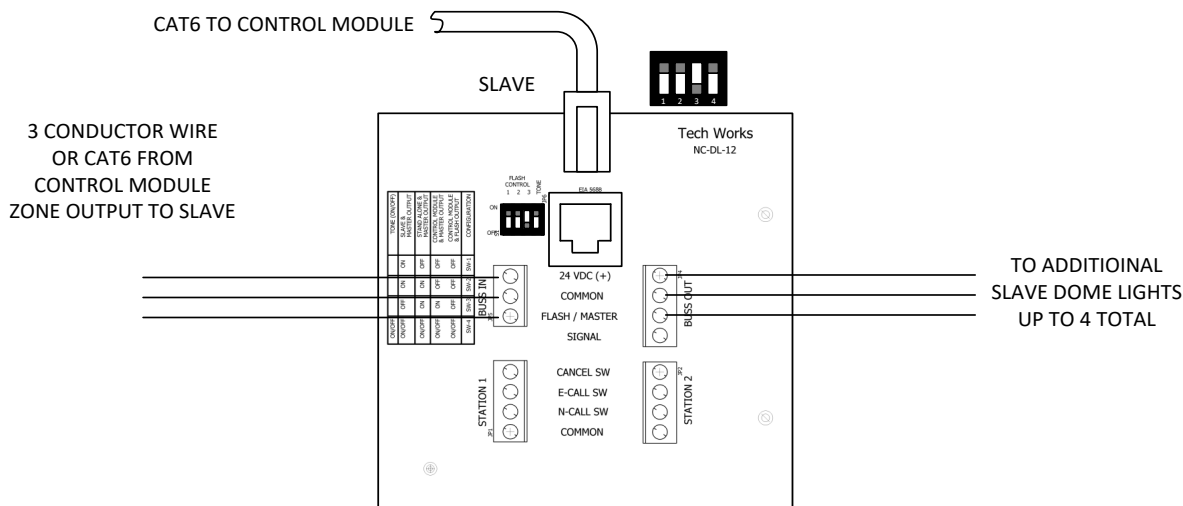**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

CAT6 TO CONTROL MODULE

Tech Works
NC-DL-12

FLASH
CONTROL
1 2 3

TONE

EIA 568B

BUSS FROM
PREVIOUS DOME LIGHT
OR
CONTROL MODULE

TONE (ON/OFF)
SLAVE & MASTER OUTPUT
STAND ALONE & MASTER OUTPUT
CONTROL MODULE & MASTER OUTPUT
CONTROL MODULE & FLASH OUTPUT
CONFIGURATION

| | SW-1 | SW-2 | SW-3 | SW-4 | |
|ON/OFF| ON | ON | OFF | OFF | |
|ON/OFF| ON | OFF | ON | OFF | |
|ON/OFF| OFF | ON | ON | OFF | |

BUSS IN

24 VDC (+)

COMMON

FLASH / MASTER

SIGNAL

BUSS OUT

BUSS TO NEXT
DOME LIGHT

SIGNAL OUT TO
CONTROL MODULE

STATION 1

CANCEL SW
E-CALL SW
N-CALL SW
COMMON

STATION 2

Tech Works

REMOTE CANCEL
CONTACT

REMOTE CANCEL
NORMALLY OPEN

REMOTE CALL LIGHT
IF REQUIRED

LED
+
COMMON

N-CALL

E-CALL

CANCEL

**Remote Cancel Station Wiring**

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

When a room needs more than 1 dome light as an indicator for multiple locations, like 2 doors to a single room, use the NC-DL-12-RSCT in both locations, and make one a Master and all others Slaves.

Always connect the room stations to the Master dome Light, not to a Slave.
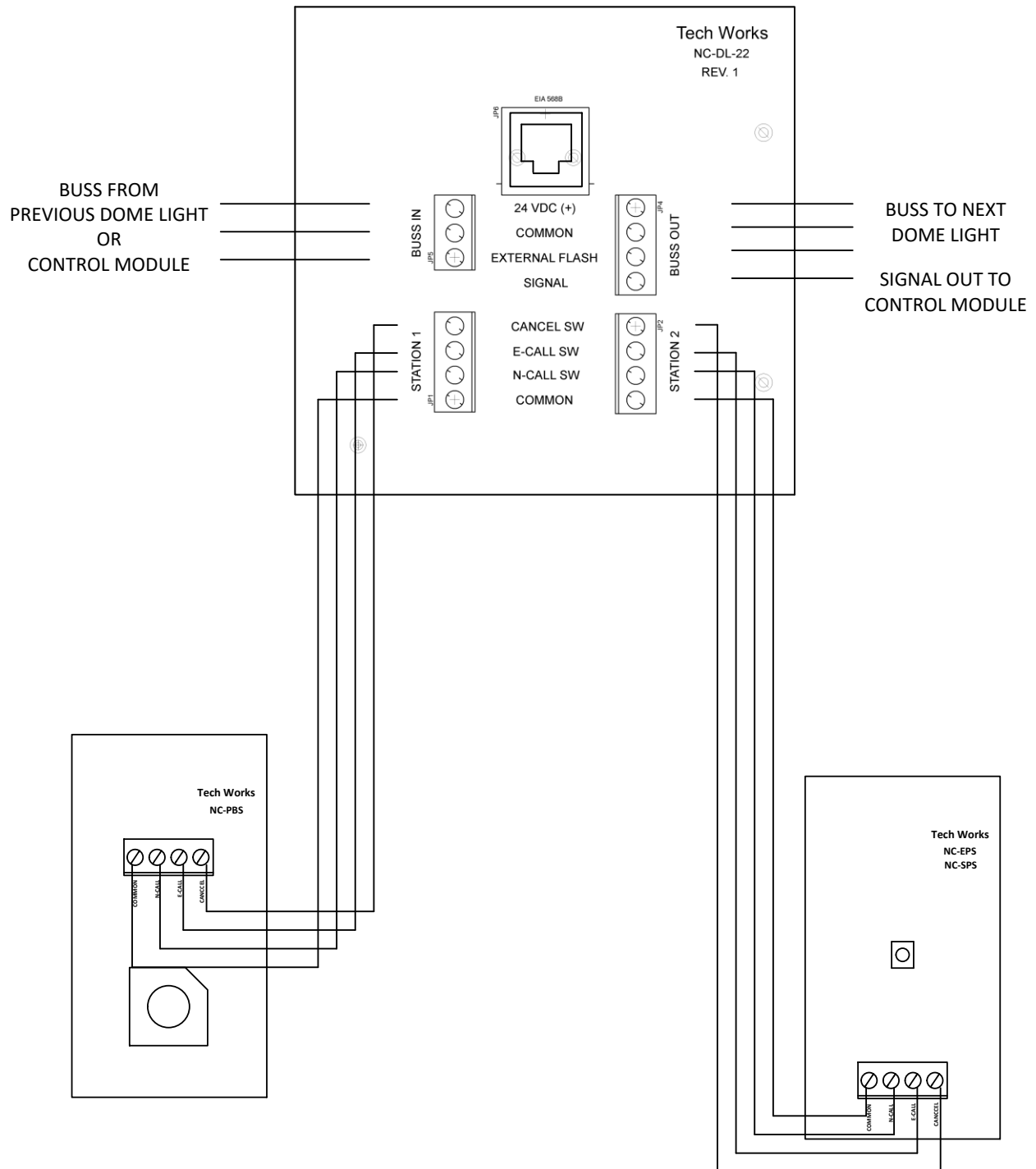
Set the Master Dip Switches 1, 2, 3 as Off, Off, On and the Slave as On, On, Off.



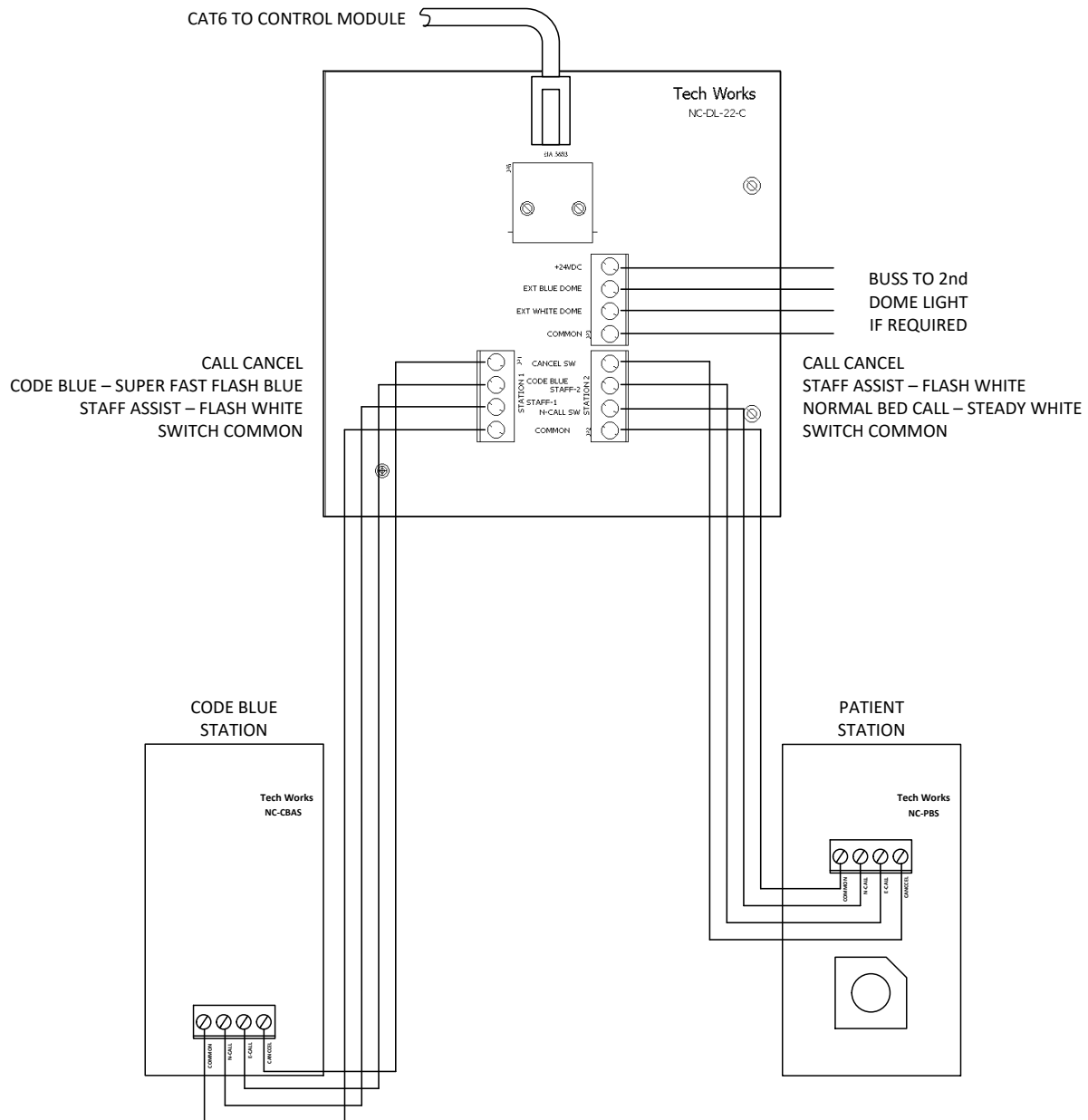When a Zone Light is needed the NC-DL-12-RSCT is used by setting it as a Slave.

**NC-DL-22-RW**



Tech Works
NC-DL-22
REV. 1

EIA 568B

BUSS IN
JP5

24 VDC (+)
COMMON
EXTERNAL FLASH
SIGNAL

BUSS OUT
JP4

BUSS FROM
PREVIOUS DOME LIGHT
OR
CONTROL MODULE

BUSS TO NEXT
DOME LIGHT

SIGNAL OUT TO
CONTROL MODULE

STATION 1
JP1

CANCEL SW
E-CALL SW
N-CALL SW
COMMON

STATION 2
JP2

Tech Works
NC-PBS

COMMON  N-CALL  E-CALL  CANCEL

Tech Works
NC-EPS
NC-SPS

COMMON  N-CALL  E-CALL  CANCEL

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

## NC-DL-22C-BR or BW Code Blue Dome Lights

CAT6 TO CONTROL MODULE

Tech Works
NC-DL-22-C

+24VDC
EXT BLUE DOME
EXT WHITE DOME
COMMON

BUSS TO 2nd
DOME LIGHT
IF REQUIRED

CALL CANCEL
CODE BLUE – SUPER FAST FLASH BLUE
STAFF ASSIST – FLASH WHITE
SWITCH COMMON

CANCEL SW
CODE BLUE STAFF-2
STAFF-1 N-CALL SW
COMMON

STATION 1

STATION 2

CALL CANCEL
STAFF ASSIST – FLASH WHITE
NORMAL BED CALL – STEADY WHITE
SWITCH COMMON

CODE BLUE
STATION

Tech Works
NC-CBAS

COMMON
N-CALL
E-CALL
CANCEL

PATIENT
STATION

Tech Works
NC-PBS

COMMON
N-CALL
E-CALL
CANCEL

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

## Control Module:
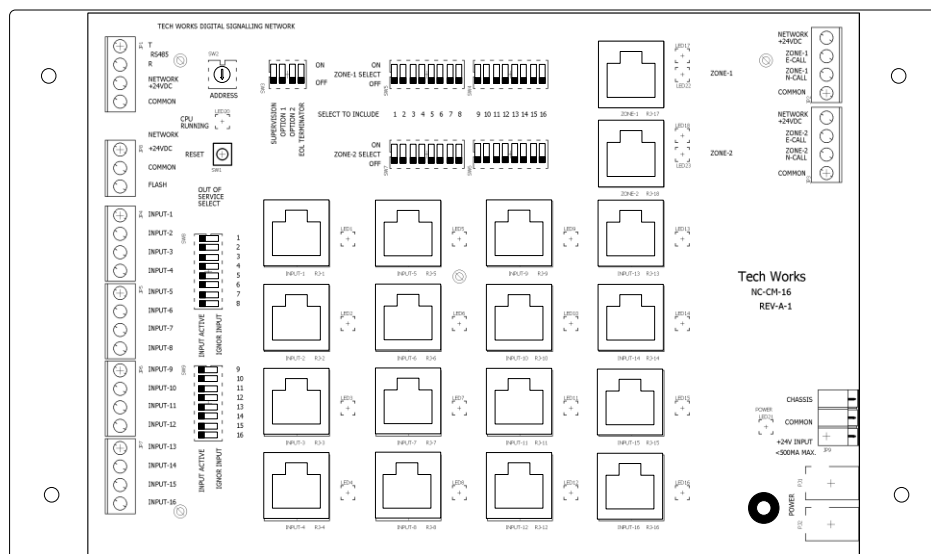


The Tech Works **NC-CM-16** is the modular central equipment that monitors and powers up to 16 patient room Dome Light call points. Each control module converts the status of call points to our RS485 Network Communication. Each Control Module is addressable on the Tech Works Network using a rotary switch to select one of 16 addresses. So 16 Control Modules, each monitoring 16 Patient Room Call Points is 256 Rooms per system.

The **NC-CM-16** is designed to monitor the **NC-DL-12** and **NC-DL-22** Dome Lights. Each Dome Light has circuitry to monitor two calls per room; Normal and Emergency. Each Dome Light has a "Signal" output that reports the status of that Dome Light to the Control Module by an Individual "Station Signal" wire. The Signal wire can be supervised for proper operation to each Dome Light. Supervision can be turned off globally in software by an "Option" dip switch. Unused inputs can be place "Out of Service" by an individual dip switch for each input. Built in Station indicator lights tell the installer the status of call points at any time.

Each of the 16 Signal inputs has an associated Indicator next to the RJ11 connector for that input. Whether the signal is from an individual signal wire or a CAT6 connection, the indicator will show the status of that input. If the Configuration switch is set to "Supervision", any unused input will have a slow flashing indicator. If an input has a pending Normal Call the indicator will be on steady. If the input has a pending Emergency Call the indicator will Fast Falsh.

The Control Module also includes "Zone" output terminals or CAT5 connectors for adding up to two Zone Lights or Duty Stations. Each Zone output is dip switch selectable to display any combination of the 16 Room signals.

The Tech Works RS485 Network allows connection of a variety of "Smart" devices for output of station status. The Network Smart devices can be Annunciator Panels for wall or desk display, or Digital Interface Modules (DIM) to convert the data to a different output format to interface with Pocket Page or Person Computers. Because the information from a Control Module is converted to a digital network signal it can be sent anywhere, over a variety of media, to any other digital device. The Network is the power of integration.

**System Wire:**

**Field Device Wiring:**
Wire connecting Control Modules to Dome Lights can either be run as multiple home runs of CAT5 or as Buss Loop for power with an individual home run wire for signaling, one from each room. Two sets of connectors are included.
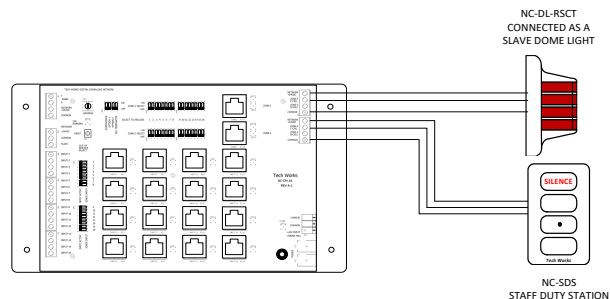
1. CAT 5 or CAT6 #24 or 22 gauge wire – Home run
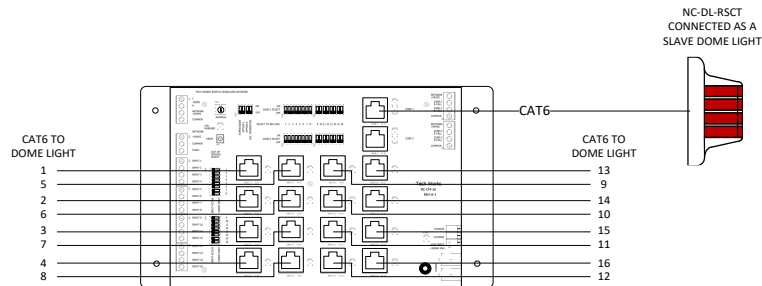


2. Power Loop of #18 or #16 gauge wire with #22 or 20 gauge Home run single conductor.



3 Conductor Buss Loop                Individual Annunciator Wires
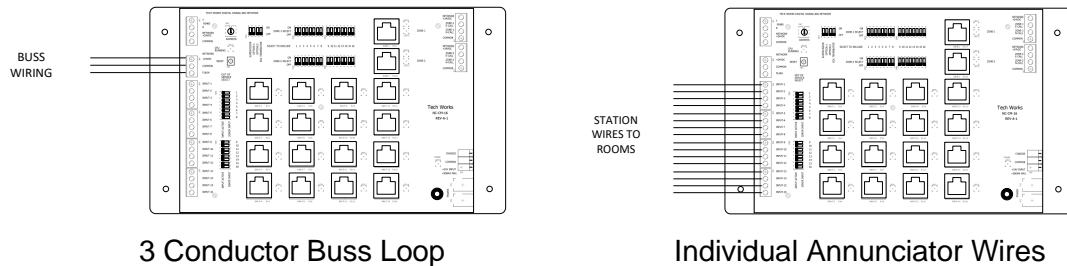
3. Zone Outputs can be CAT or 3 conductor wire. Screw terminals make 3 conductor wire easy to install. Up to 4 devices can hook in parallel to each Zone output.



A system can combine wiring techniques and use some CAT wire and some individual conductor wire all in the same system, on the same Control Module.

Assuming a worst case voltage drop of 10 Volts Maximum and a worst case current load of 110 MA for a Dome Light, any wire run should not exceed 500 feet in total length.
CAT5 or CAT6 Home Run wiring from each Dome Light is recommended for new installations.

Network Wiring:
Digital communication to other devices
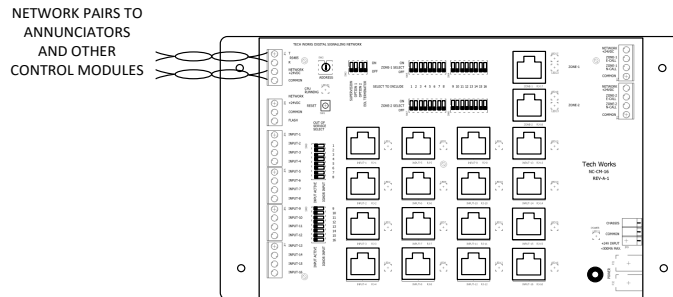


Network wire must be **Twisted Pair** cable to reduce data noise. For small networks with only a single annunciator a CAT type cable will work fine. For large systems with multiple annunciators and other Network powered devices, a larger gauge wire like a West Penn Wire 651 or 751 are recommended.

Master addressing:
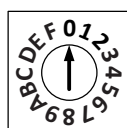


**MASTER ADDRESS**

A rotary switch is provided for direct selection of the Master address to be monitored. Simply turn the arrow until it points at the Master address of the stations you want to display. If there is more than one NC-CM-16 in a system they should each have a unique Master address.

To display the status of the stations connected to a Control Module simply set the address of an Annunciator panel to match the address of the Control Module to be displayed.

Configuration Options:



SUPERVISION
OPTION 1
OPTION 2
EOL TERMINATOR

Supervision – Is provided of all Dome lights as an option. If the Installer does not want to supervise the wiring to the dome lights, the switch can be turned to the down or OFF position and no supervision will be provided to any Dome Light.

No Option = Function like old NC-CM-16, Fast Flash and On Steady on Ecall Screw Terminal, No action on Ncall Screw Terminal
Option 1 - (SW3-2) = Zones 1 & 2 Code Blue on Ecall and On/Fast Flash on Ncall
Option 2 - (SW3-3) = Zones 1 & 2 Fast Flash on Ecall and On Steady on Ncall
Functional Option 3 - (Option 1-SW3-2 & Option 2-SW3-3) =
                        Zone1 Code Blue like Option 1, Zone 2 like option 2
EOL Terminator – Is provided to add an "End Of Line" resistor to the end of the Network if this is the last module on the Data wire.

CPU Running:
The CPU Running indicator tells the Installer that the Control Module is alive and the processor is working correctly by blinking slowly. If the indicator is not blinking slowly the CPU is not functioning correctly.

Reset:
If the Master Address or Configuration switches are changed, while power is applied, they need to be read by the CPU. To implement switch changes, press the Reset button and wait for the CPU Running light to begin slow flashing.

Out of Service Select:

INPUT ACTIVE    IGNORE INPUT

1
2
3
4
5
6
7
8
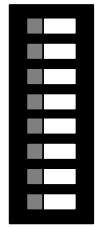
If the Configuration "Supervision" Switch is ON then any signal line that is not properly connected to a working Dome Light will send a Slow Flashing signal to the station indicator light. This will be reflected on any associated Annunciator panels.

Each Signal Input has an associated Out Of Service switch to selectively make each input "Active" or "Ignore". If a signal line switch is in the 'Active" ON position, that signal line is being monitored. If a signal line switch is in the "Ignore" position, that line is not monitored and is considered "Out Of Service".

9
10
11
12
13
14
15
16
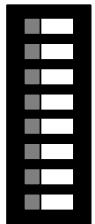
If you have less than 16 stations connected and want to shut off the Supervision to only those stations that are not connected, then setting those stations to "Out Of Service", "Ignore Input" will cause them to be ignored by the processor.

When a signal line from a station is ignored it will not receive any signals at all from that station. So if a Dome Light is connected and "Ignore Input" is set to ON there will be no supervision or alarm signals from that station.

Zone Outputs:
The Control Module also includes "Zone" output Screw Terminals or CAT5 connectors for adding up to two groups of Zone Lights or Duty Stations. Each Zone output is dip switch selectable to display any combination of the 16 Room signals.

ON
SELECT
OFF

1  2  3  4  5  6  7  8        9 10 11 12 13 14 15 16

The Installer can select any one, any combination, or all signals to be monitored and sent to either Zone Output. As shipped all inputs are monitored by both Zones. To turn OFF monitoring for either Zone, simply turn the Signal Dip Switch, to the OFF or Down Position.

Power Connection:
There are 3 Power connections for convenience. All three power connectors are hardwired in parallel. PJ1 and PJ2 are provided to allow easy plugging of multiple Control Modules into a common power supply. The screw terminals are provided for hardwire access to the power if required. The Chassis Screw Terminal is provided to connect the metal enclosure to Earth for Galvanic Grounding of the housing.

Power Indicator:
The Power indicator monitors the output of the power supply, not the 24 Volt input. In this way it is telling the Installer that the Fuse is not blown and that the circuitry is getting power. If the Power indicator is Off the Power supply may be fine and the fuse protection has been activated on the unit. Use a meter to check the input voltage across the Common and +24V Input. If there is input power but the power indicator is not ON, then the NC-CM-16 is in power protection form faulty field wiring. Repair the field wiring and the circuitry should self-restore and return to Active.
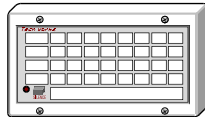
## Annunciator Panels
### NC-AN-16C-T
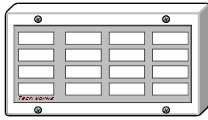
The Tech Works **NC-AN-16C-T** is a 16 Light Intelligent Annunciator panel. A big window allows for large labeling of call points. Labels are back lit so the call point lights up when a station is active.

### NC-AN-32C-T

The Tech Works **NC-AN-32C-T** is a 32 Light Intelligent Annunciator panel. A window allows for labeling of call points. Labels are back lit so the call point lights up when a station is active.

## Network Wiring

Tech Works Annunciators are addressable digital communication devices using Intelligent Control Modules for call point monitoring. Each Annunciator corresponds to one or more **NC-CM-16** Control Module by simply setting their address the same. So if you have a Control Module monitoring a group of up to 16 Rooms, and you want these call points to display in two separate locations, all you need to do is place two **NC-AN-16C-T** Annunciators where they are needed and set the address the same as the Control Module that is monitoring those rooms.

Made of white ABS plastic with a removable faceplate, each unit can be custom labeled to identify staff or locations. An integral tone sounds to draw attention to any change of status.

Mechanical mounting is to an industry standard 4 gang electrical box. No special hardware or custom mounting box is required.
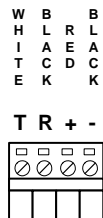
Wiring is four screw terminals to interface to the Tech Works Network. The Net Work is 2 twisted pair wires. One Pair of wires is Network Communication data and the other pair is power. **Wire must be connected "T" to "T", "R" to "R", "+" to +", and "-" to "-" between devices or from device to device for proper operation.** #18 gauge two twisted pair cable, similar to West Penn Wire #751 is recommended.

Be sure to tighten the screw on the wire tightly. U.L. Torque Spec: 3.5 lb. / in.

The first pair is RS485 terminated bus topology, operating at 39K baud in a parallel connection plan. Because this is a distributed processor system, each intelligent device contains a micro controller, so there is "NO Central Processor". Each device is totally self-contained and can be used as a stand alone or in combination with any other intelligent network device.
The second pair is 12 VDC power in a parallel connection plan.

The system is designed to operate on unshielded twisted pair cable from 24 to 18 AWG.
The twist of the cable is critical to the proper communication of data on the network to avoid noise interference. Any standard voice grade twist should provide adequate noise cancellation under normal operating conditions. All wiring is NEC Class 2.
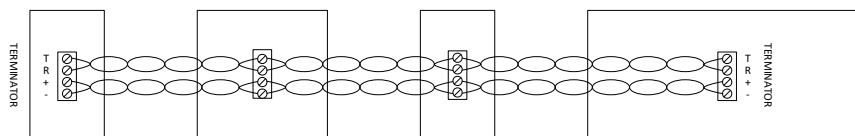
**Network Termination**

Two major factors contribute to the prober operation of the Tech Works Digital Network.
1. Twisted wire
2. Termination

Twisted wire such as telecommunications voice or data cables all use twisted pairs to reduce noise and cross talk by 180 degree phase reversal of any Electro Magnetic Fields cutting through the cable. Tech Works Network uses a very stable and low speed data communication so just about any twisted wire will work, but twisting of the data communication pair is critical to proper operation.

Proper termination of a network is critical to proper operation due to noise and interference from things such as florescent lights and other electrical noise in the environment. The basic idea is to terminate the very ends of the wire loop. By placing a 120 ohm resistor across the network data pair the noise is significantly reduced and performance improved.
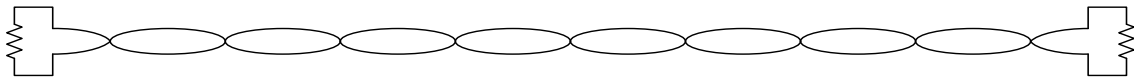
The 120 ohm resistor is built in to all Tech Works Network products and is turned on by a dipswitch located near the data pair wiring connector screw terminals. On the first and last device on the network simply turn the dip switch to the "ON" position on that device. Leave the "Terminator" dip switch set to the OFF position on all other network devices.
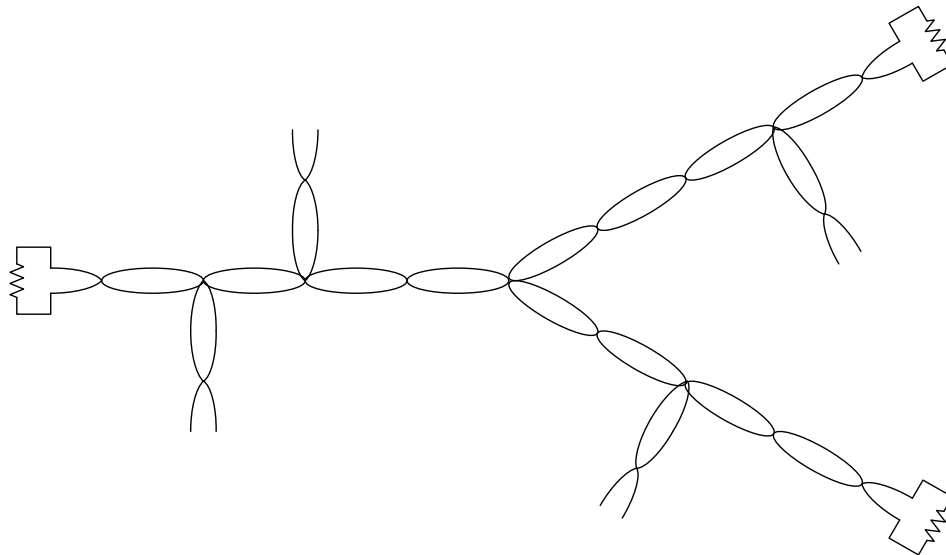
Often times a Tech Works Network does not work out as a perfect loop and looks more like a modified star wiring plan. In that case do not terminate all network ends. Only turn on the Terminator on the longest wire runs of similar length. Leave the short branches unterminated. By terminating a short branch it acts like a traffic gate has been placed across the network and messages will not pass. The sections of the network on either side will communicate fine, but the left side will not talk to the right side of the network.

**Network Addressing and Programming**

The N**C-AN-16C-T** and the **NC-AN-32C-T** share a lot of programming functionality, and a variety of color and labeling options are available.

Master addressing:
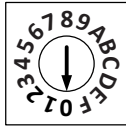
A rotary switch is provided for direct selection of the Master address to be monitored. Simply turn the arrow until it points at the Master address of the stations you want to display.

**MASTER ADDRESS**

For two or more panels to display the same information, simply set the Master address to match each other, and they will share the same information.

Each **NC-AN-16C-T** has 16 White Lights to the left of each window and 16 White Lights to the right of each window. How these lights react to incoming call is set by a three-position jumper on the main board.

Disconnect power from the annunciator. Remove the plastic face cover of the unit. Unplug the top display board from the main control board. You will see 3 jumpers, near the middle of the board, P10, P11, P12.
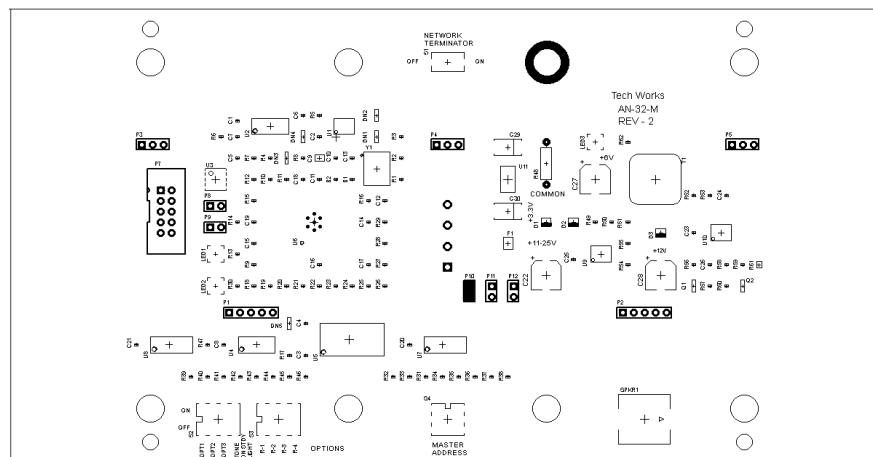


P12 (Default) sets the lights to function as a normal 3 level call system with Code Blue Calls going to the left light and Emergency and Normal Calls going to the right light.

Moving the jumper to P11 causes both lights to come on with any Code Blue, E-Call, or an N-Call but the Code Blue will mask any other call and E-Call will mask an N-Call.

Moving the jumper to P12 turns the annunciator into a three-level call system and causes the left light to become a Code Blue indicator with Super-Fast Flash and tone, while the right light indicates N-Calls and E-Calls.
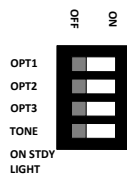
The NC-AN-32C-T is designed to display 32 stations / rooms. This is two NC-CM-16 Control Modules. So the addressing is a little trickier. Because each NC-AN-32 displays two, NC-CM-16, the display is the Control Module that matches the address setting plus the next Control Module Address in sequence. So if you set the NC-AN-32-T Address to 3 it will display Control Module 3 and 4. If you set the NC-AN-32-T Address to C it will display Control Module C and D. At Address F it wraps back around to Address 0 so if you set the NC-AN-32-T Address to F it will display Control Module F and 0. The Lower of the 2 Addresses always appears on the left 4 columns of the NC-AN-32-T and the Higher Address always appears on the right hand 4 columns of the NC-AN-32-T.

## Annunciator Option Dip Switches
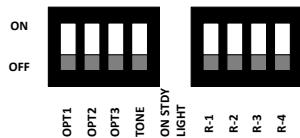
The Option dip switches S2 and S3 determine how each annunciator reacts to signals from remote stations. They also determine how and if the Annunciator sends messages to the network.

The OPT or Option switches determine how the annunciator responds to button pushes or signals from the network and what messages are sent to the network. OPT1, OPT2, and OPT3 are not implemented in the NC-Series at this time and are reserved for future options. The TONE Option switch turns on the function of a Tone associated with any Steady Lamp signal a Single Tone will sound with any Steady Light and a reminder Tone will sounds every 20 seconds.

The "R" switches determine what Row or Color will have any associated Tone.
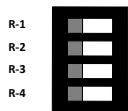
If R-1 is on then a Tone will sound with any Red Light.
If R-2 is on then a Tone will sound with any Yellow Light.
If R-3 is on then a Tone will sound with any Green Light.
If R-4 is on then a Tone will sound with any Blue Light.

If All of the "R" switches are ON a Fast Flash will always sound a repeating tone on any light.
If the "TONE" switch is ON then a Single Tone will sound with any Steady Light and a reminder Tone will sounds every 20 seconds.

**System Power**

**PS-2437A** System Power is provided by a 24VDC, 3.7 Amps Regulated and Filtered computer grade switching power supply. Ground is isolated from the power supply 24 VDC common connection to provide galvanic isolation in critical applications. The power supply operates from a 120 or 240 VAC 60 Hz supply. This unit is UL and CSA listed and comes with a surface mount metal enclosure.

The Nurse Call Control Module, NC-CM-16, is the Hub of a Nurse Call System

Power is supplied to the Control Module, and for wiring convenience, passed through to the peripherals

The Nurse Call System consists of "Buttons" & "Annunciators" (Visual & Aural)…

The Quiescent Power use is very low. As Annunciators are activated, the Power Requirements increase

**Power Requirements** may be determined by using this Chart:

| Designator | Product Name | Quiescent Current | Maximum Current | Notes |
|---|---|---|---|---|
| NC-CM-16 | Control Module - 16 Point, Addressable Input Interface | ~30 MA | ~55MA | No Peripherals Attached |
| NC-DL-12-*SCT | Dome Light-1 Color, any color, 2 Input, Screw terminal wiring, CAT5 wiring connector, with Tone sounder unit | ~35MA | ~80MA | Used as Master |
| NC-DL-12-* | Dome Light-1 Color, any color, 2 Input, CAT5 wiring connector | ~30MA | ~70MA | Used as Slave |
| NC-DL-22-* | Dome Light-2 Color, any colors, 2 Input, CAT5 wiring connector | ~15MA | ~80MA | |
| NC-CBAS | Code Blue with Staff Assist Station | ~0.2MA | ~8MA | |
| NC-CBS | Code Blue Station | ~0.2MA | ~8MA | |
| NC-EPS | Emergency Pull for Help Station | ~0.2MA | ~8MA | |
| NC-PBS-1 | Patient Bed Station, Single Bed | ~0.2MA | ~8MA | |
| NC-PBS-2 | Dual Patient Bed Station | ~0.2MA | ~8MA | |
| NC-SAS | Staff Assist Station | ~0.2MA | ~8MA | |
| NC-SDS | Staff Duty Station | ~20MA | ~35MA | |
| NC-SPS | Staff Presence Station with Call for Help | ~0.2MA | ~8MA | |
| NC-CS | Cancel Only Station | ~0.2MA | ~8MA | |
| NC-VP-CB | Rugged Code Blue Button | 0 | 0 | Switch Only |
| NC-VP-CS | Vandal Proof Cancel Only Station | ~0.2MA | ~14MA | |
| NC-VP-PBS | Vandal Proof Patient Bed Station | ~0.2MA | ~14MA | |
| NC-VP-SAS | Vandal Proof Staff Assist Station | ~0.2MA | ~14MA | |
| NC-VP-SAS-RC | Vandal Proof Staff Assist Station w/Remote Cancel | ~0.2MA | ~14MA | |
| VPBL-1 | | 0 | ~10MA | |
| VPKS-1 | | 0 | 0 | Switch Only |

**Maximum System Peripherals:**

A single NC-CM-16 should never have more than a total of 24 Domes Lights connected at any time, whether used as Room Station Dome Lights or Zone alarms
A single Dome Light should never have more than 8 Call Stations connected at any time:
        4 Call Stations per Input, times 2 Inputs

**Typical Load**

| 1 - each | NC-CM-16 | Control Module - 16 Point, | ~55MA | .055A |
|---|---|---|---|---|
| 2 - each | NC-DL-12-RSCT | Dome Light used as a Zone Light | ~70MA | .140A |
| 16 - each | NC-DL-22-RW | Dome Light-2 Color, Red/White | ~80MA | 1.28A |
| 16 - each | NC-EPS | Emergency Pull for Help Station | ~8MA | .128A |
| 32 - each | NC-PBS-1 | Patient Bed Station, Single Bed | ~8MA | .256A |
| 1 - each | NC-AN-16 | Annunciator Panel (Peripheral) | ~160MA | .160A |
| | | Total Current with all devices active | | 2.019A |

Nurse Call systems are normally designed for less than a 30% duty cycle, meaning that at any one time less than 30% of all devices are active.
The system designs allow two **NC-CM-16** Control Modules or up to 48 Dome Lights to share a single **PS-2437A** Power Supply**.**

**Worst Case Maximum Load**

| 1 - each | NC-CM-16 | Control Module - 16 Point, | ~55MA | .055A |
|---|---|---|---|---|
| 8 - each | NC-DL-12-RSCT | Dome Light used as a Zone Light | ~70MA | .560A |
| 16 - each | NC-DL-22-RW | Dome Light-2 Color, Red/White | ~80MA | 1.280A |
| 64 - each | NC-EPS | Emergency Pull for Help Station | ~8MA | .512A |
| 64 - each | NC-PBS-1 | Patient Bed Station, Single Bed | ~8MA | .512A |
| 2 - each | NC-AN-16 | Annunciator Panel (Peripheral) | ~160MA | .320A |
| | | Total Current with all devices active | | 3.239A |

When used under maximum load conditions a dedicated PS-2437A power supply is recommended for each NC-CM-16 control module

**Control Module Circuit Protection:**

The Control Module circuit protection is designed to allow normal operation without faults and In the event of a fault, short circuit or component failure, shut down without damage.
The Control Module uses two Resettable Fuses, one for Internal Circuitry, one for the Peripherals.
Resettable fuses have a wide range of Operational Characteristics
The Specified Current will 'Hold' forever; short transients above the rated current will not cause false tripping.
Increasing overloads will cause shorter Trip times… two times the Rated Current causes a very fast Trip Time
The 300MA Fuse protects against Internal Circuit Faults…
The Switching Power Regulator automatically shuts down in the event of an overload
An extended overload, will also trip the fuse…
The 1.85A Fuse protects the Control Module Circuit Board from Faults in the external Wiring and Peripherals
Nurse Call Peripherals have their own Overload Protection

**Application Templates**
**Stand Alone Rest Room Emergency Pull Station**

For standalone applications such as an independent Rest Room with no remote annunciation, the NC-DL-12-RSCT has everything you need to visually signal an emergency and sound a tone with nothing but a 24 VDC power supply to power the Dome Light. The NC-DL-12-RSCT can also act as a Master or a Slave if more than one indication point is required in a small system. By simply moving an integral Dip Switch the Dome light can become a Slave to another Dome Light functioning as the Master connected to Emergency Pull Stations or Patient Bed Stations.
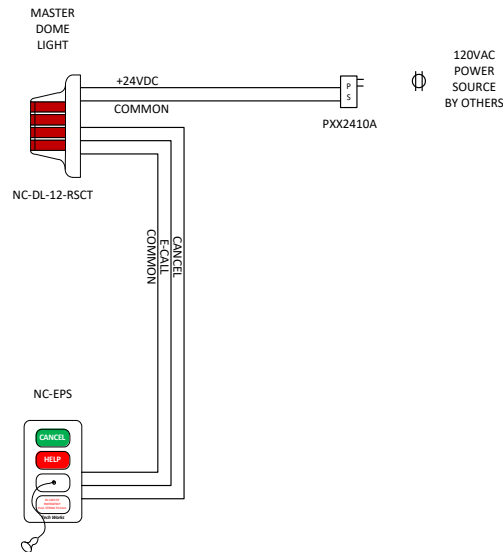


## Dome Light Master with Remote Secondary Dome Light Slave
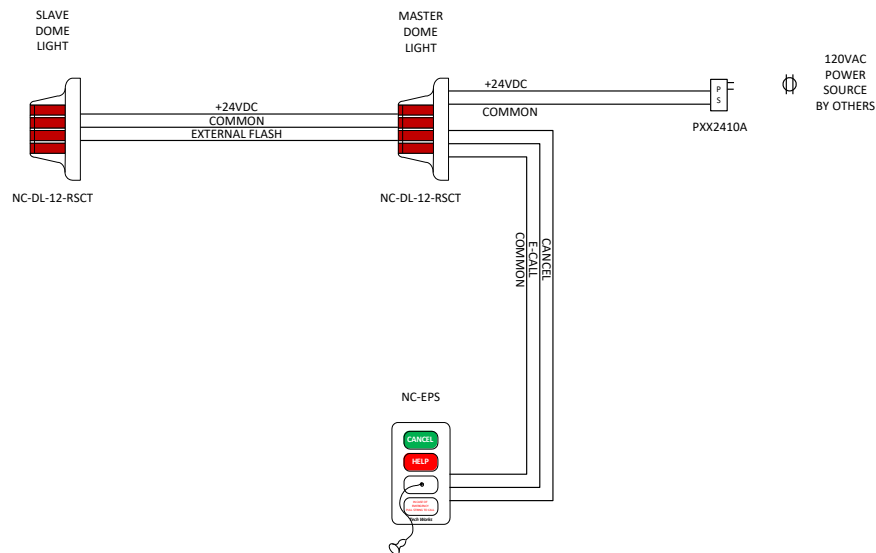


**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

# Application Templates
## 16 Room Nurse Call to a Single Annunciator
## Repurposed wire from a vintage installation
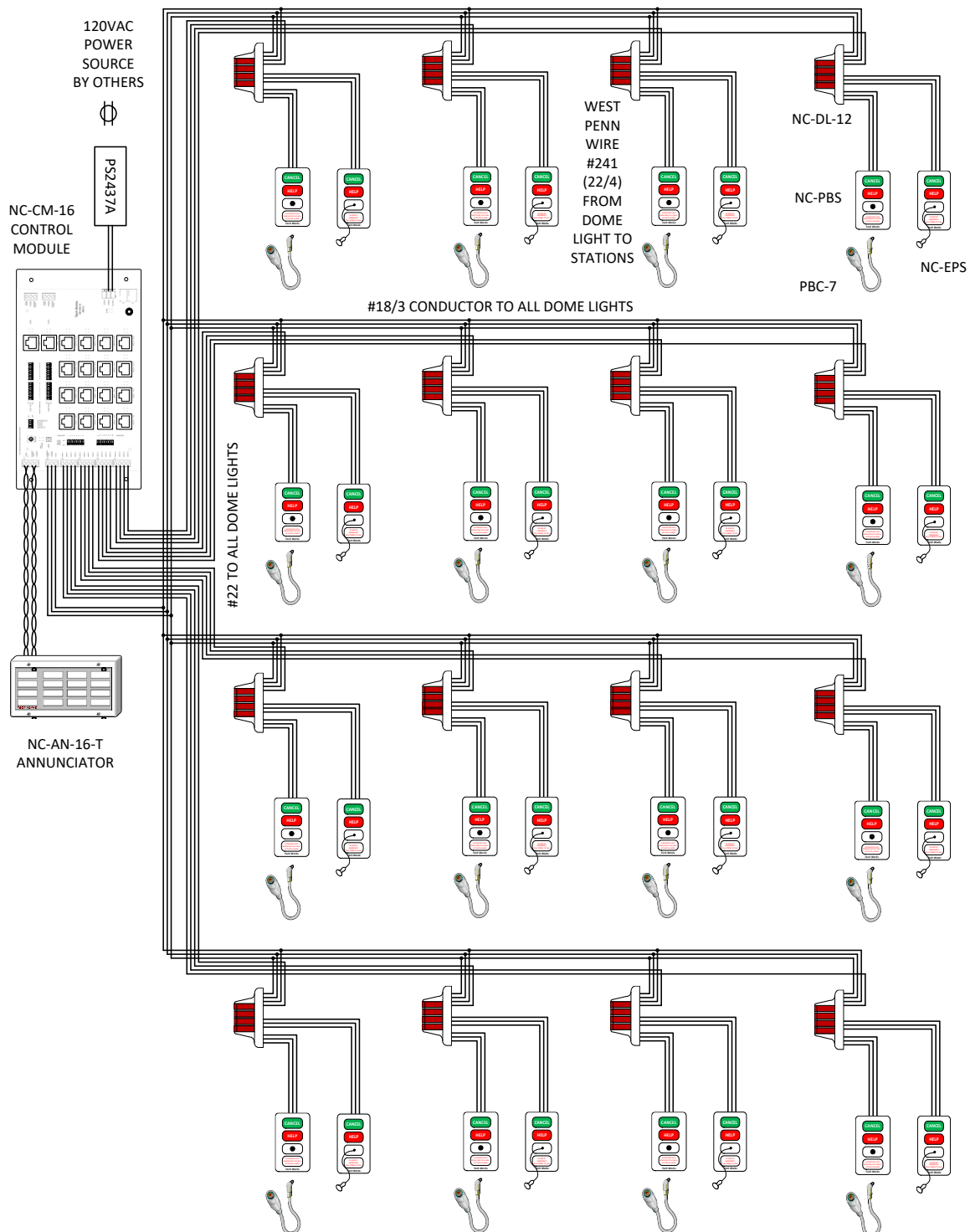


120VAC
POWER
SOURCE
BY OTHERS

PS2437A

NC-CM-16
CONTROL
MODULE

NC-AN-16-T
ANNUNCIATOR

WEST
PENN
WIRE
#241
(22/4)
FROM
DOME
LIGHT TO
STATIONS

NC-DL-12

NC-PBS

PBC-7

NC-EPS

#18/3 CONDUCTOR TO ALL DOME LIGHTS

#22 TO ALL DOME LIGHTS

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

## Application Templates
## 16 Room Nurse Call to a Single Annunciator
## All new CAT5 home run wiring
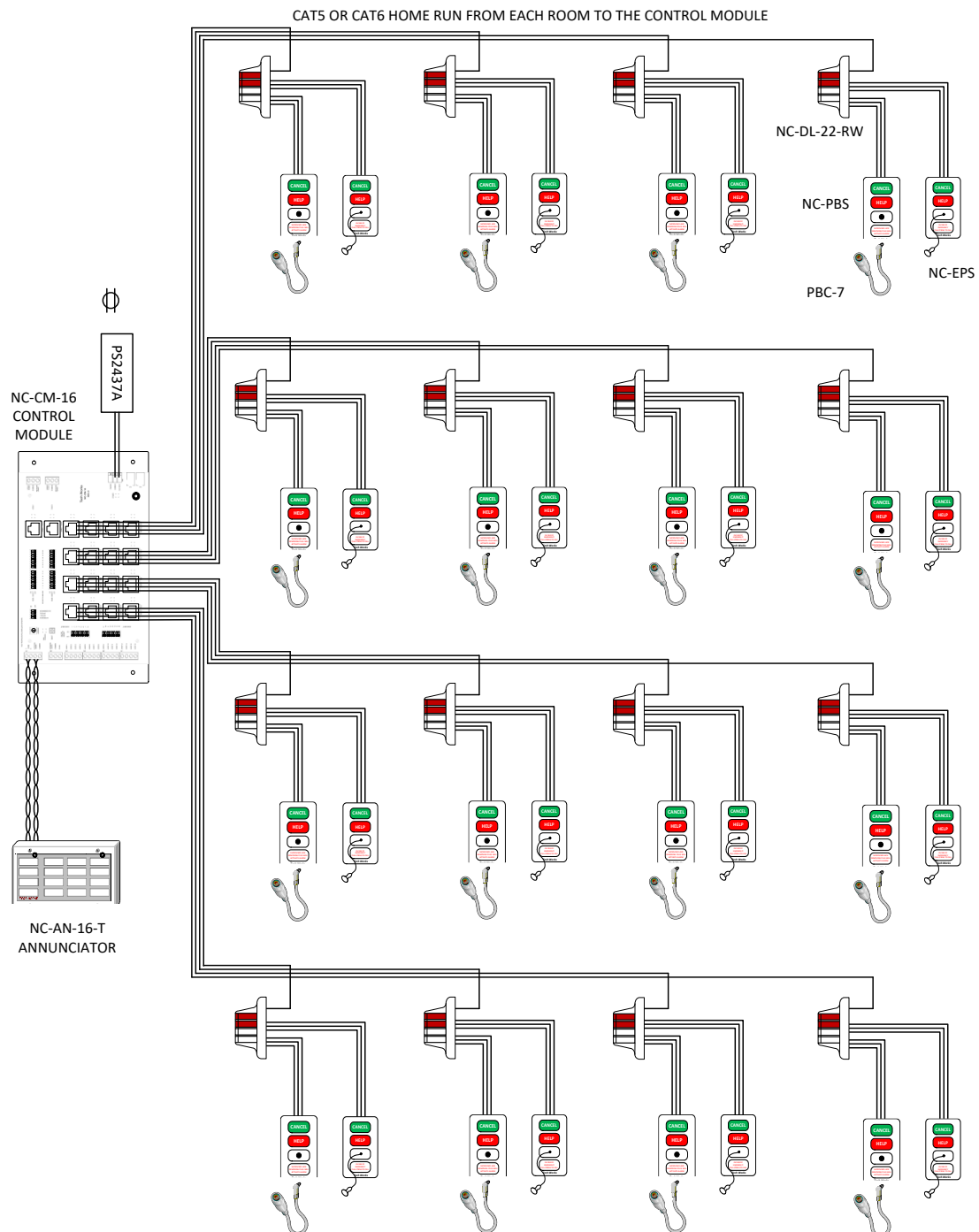
CAT5 OR CAT6 HOME RUN FROM EACH ROOM TO THE CONTROL MODULE

NC-DL-22-RW

NC-PBS

PBC-7

NC-EPS

PS2437A

NC-CM-16
CONTROL
MODULE

NC-AN-16-T
ANNUNCIATOR

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

## Application Templates
## 256 Room Nurse Call to Multiple Annunciators and Reporting Systems
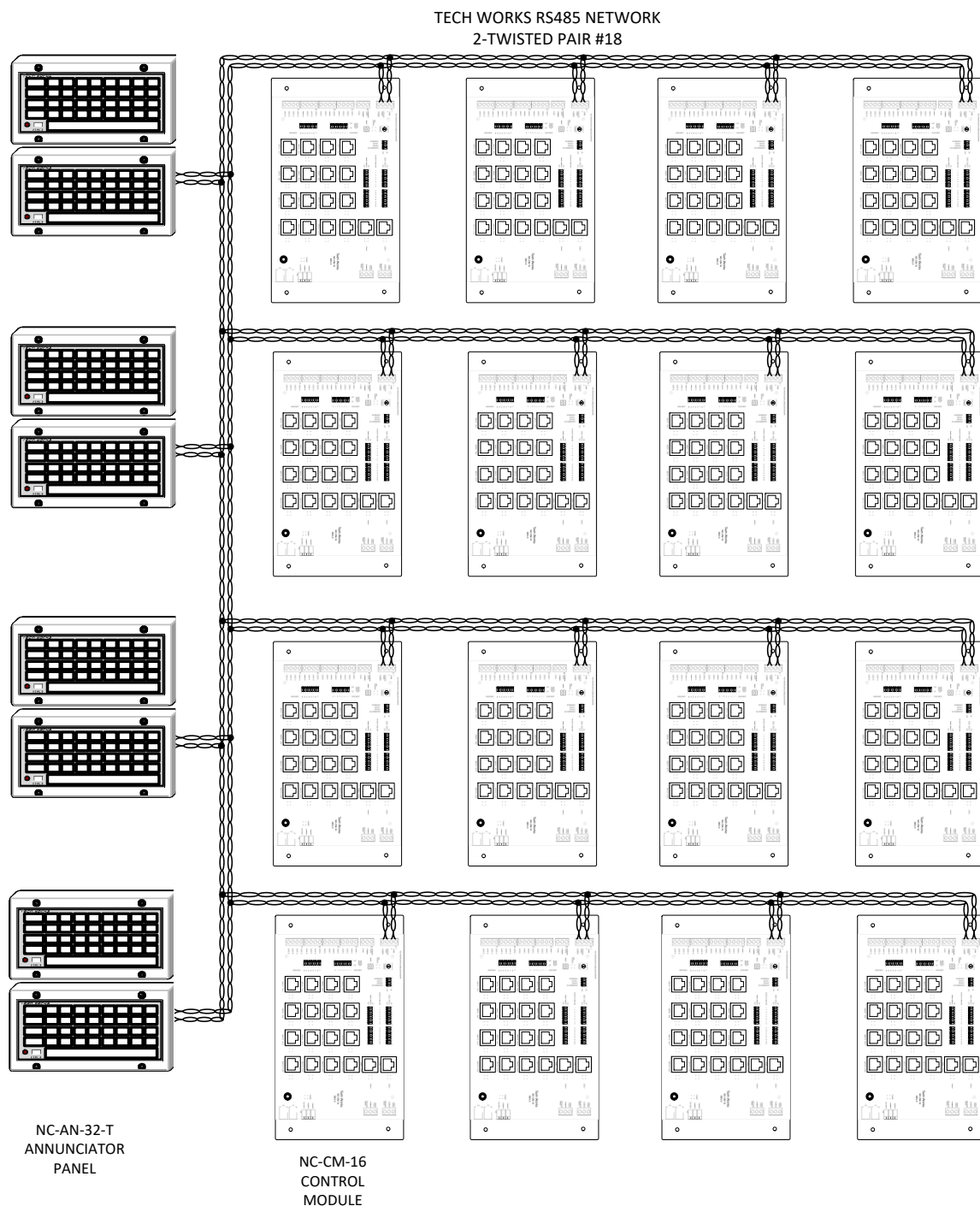
TECH WORKS RS485 NETWORK
2-TWISTED PAIR #18

NC-AN-32-T
ANNUNCIATOR
PANEL

NC-CM-16
CONTROL
MODULE

**Installation wiring must conform to UL 1069 Section 8 or CSA C22.2 No. 205-12, depending on jurisdiction.**

## Application Templates
## Zone Light and Duty Station Connection and Settings



NC-DL-RSCT
CONNECTED AS A
SLAVE DOME LIGHT

SILENCE

Tech Works

NC-SDS
STAFF DUTY STATION
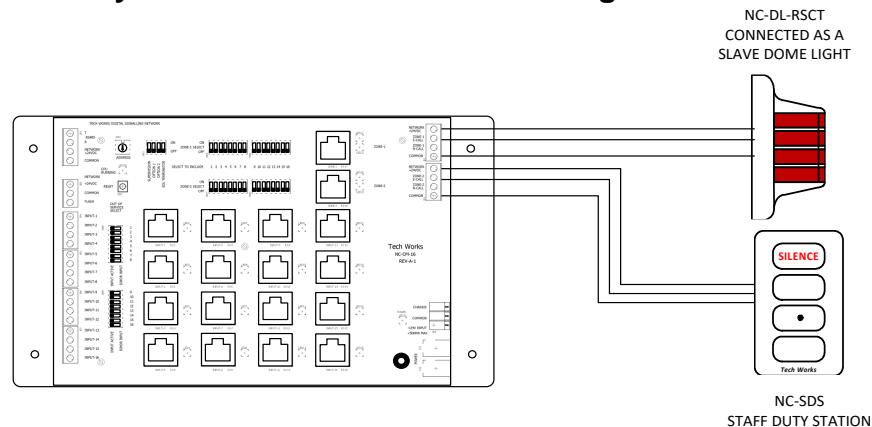
Each NC-CM-16 Control Module comes with two Zone outputs. The Zone output has a set of 16 dip switches that allow the installer to select any one or all 16 inputs to activate each Zone output. Whenever any Room Dome Light is on Steady the Zone light will be on Steady, if the associated Room Dip Switch is in the On position. If any selected room is On Flashing the associated Zone Light will be On Flashing. Flashing is the highest priority so it always overrides Steady, just like a room Dome Light.

The NC-CM-16-A has a 4-position dip switch "SW3" which is used to turn on station Supervision and Network EOL (covered elsewhere). The 2 center switches are Zone Output Options:

No Option = Function like old NC-CM-16
Functional Option 1 (SW3-2) = Both Zones Code Blue on Ecall and On/Fast on Ncall
Functional Option 2 (SW3-3) = Both Zones Fast on Ecall and On on Ncall
Functional Option 3(Option 1-SW3-2 & Option 2-SW3-3) =
Zone1 Code Blue like Option 1, Zone 2 like option 2

On the NC-DL-12-RSCT Dome Light the wire is connected as SLAVE/BUSS IN.



FLASH
CONTROL   TONE
1  2  3

ON

OFF
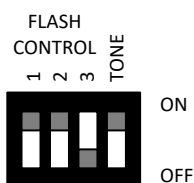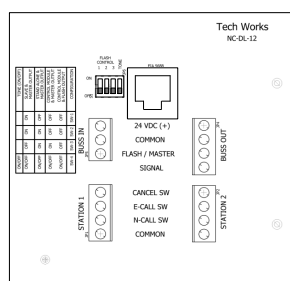
The Dip Switch is set to SLAVE, and TONE ON or OFF depending on if you want Tone or not.
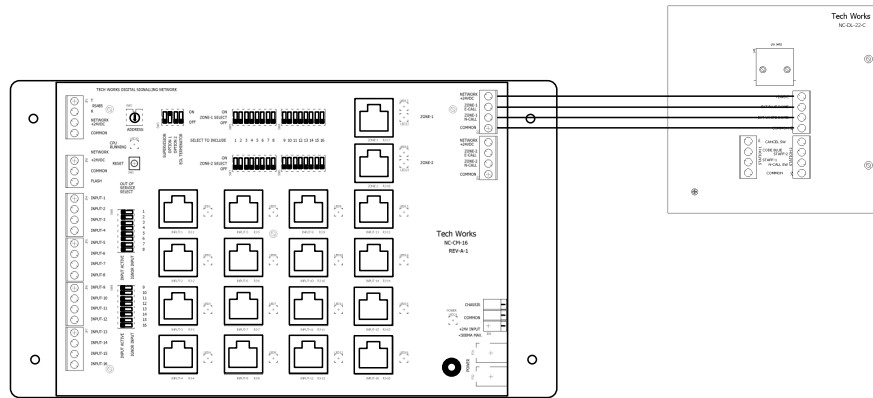
All other connections are not used.
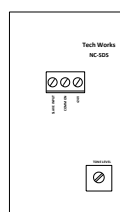


The NC-SDS Staff Duty Station is a simple 3 wire connection directly to the Zone output of the NC-CM-16 Control Module. The only setting or adjustment is the Tone Level. Simply turn the Level trim pot until the desire level is heard from the front of the unit and mount the unit to the wall. Whenever a Steady light is on a single tone will sound and whenever a Flashing light is on a repeating tone will sound. A silence button and call active light are provided on the front for user control and notification.
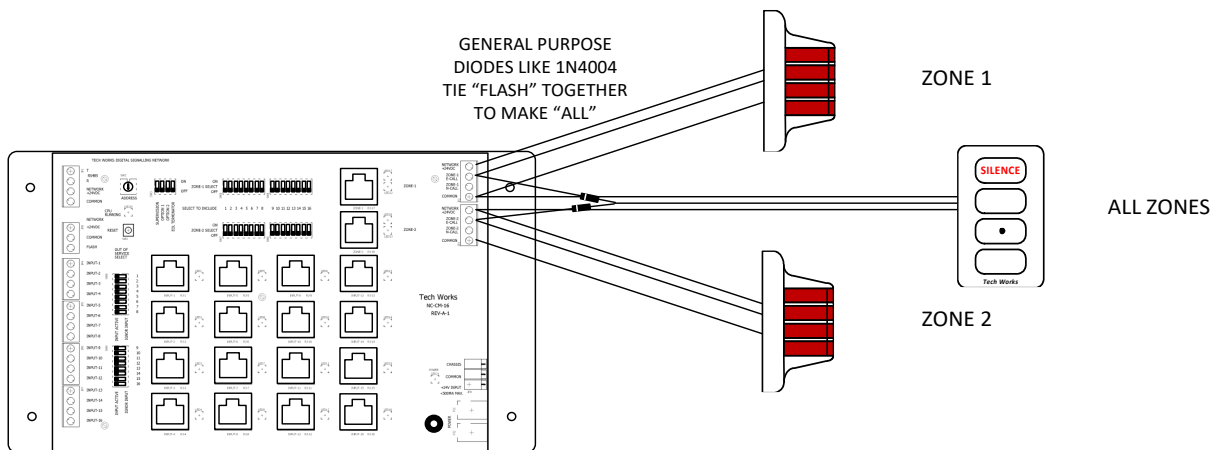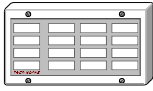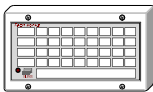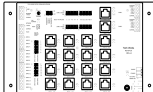
# 2 Color Zone Lights

ZONE 1
NC-DL-22C-BW

ZONE 2
NC-DL-22C-BW
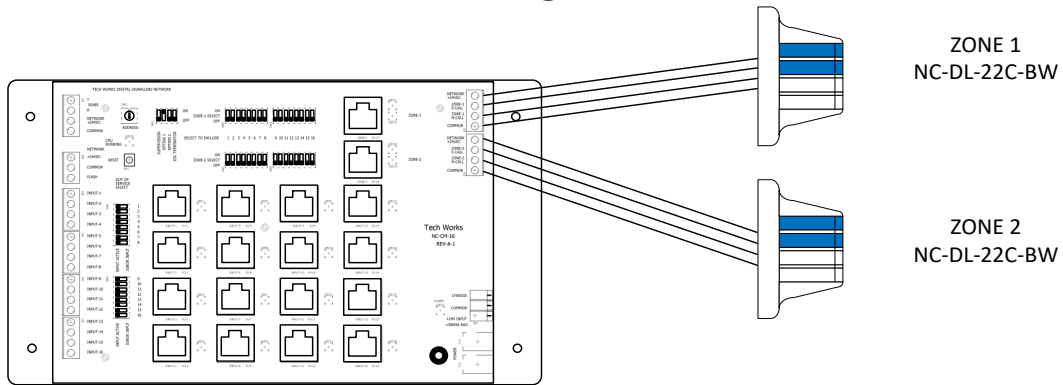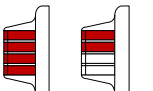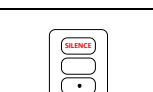
# 2 Color Zone Light Wiring Details

# 2 ZONES PLUS ALL

GENERAL PURPOSE
DIODES LIKE 1N4004
TIE "FLASH" TOGETHER
TO MAKE "ALL"

ZONE 1

SILENCE

ALL ZONES

ZONE 2

# Mounting Details

| | |
|---|---|
| | **NC-AN-16-T Annuciator Panel - 16 Point, Tone/Visual**<br>8.25 inches Wide X 4.5 inches High l<br>Mounts to a 4 gang electrical box or plaster ring.<br>Alternate mounting possible to a 2 gang electrical box or ring |
| | **NC-AN-32-T Annuciator Panel - 32 Point, Tone/Visual**<br>8.25 inches Wide X 4.5 inches High<br>Mounts to a 4 gang electrical box or plaster ring.<br>Alternate mounting possible to a 2 gang electrical box or ring. |
| | **NC-CM-16 Control Module - 16 Point, Addressable Input Interface**<br>11" Wide X 3" Deep X 6" High<br>Mounting is surface mount. Meant to be wall mounted to a plywood back board. |
| | **All NC-DL-12-* and NC-DL-22-* Dome Light**<br>5 inches Wide X 3.5 inches Deep X 5.25 inches High l<br>Mounts to a 2 gang electrical box or plaster ring.<br>Alternate mounting NC-DL-22 possible to a 1 gang electrical box or ring |
| | **NC-CBAS  Code Blue w/Staff Assistance Station**<br>**NC-CBS Code Blue Station**<br>3.25 inches Wide X 0.5 inches Deep X 5.25 inches High l<br>Mounts to a 1 gang electrical box or plaster ring. |
| | **NC-EPS Emergency Pull for Help Station**<br>**NC-PBS-1 Patient Bed Station, Single Bed**<br>3.25 inches Wide X 0.5 inches Deep X 5.25 inches High l<br>Mounts to a 1 gang electrical box or plaster ring. |
| | **NC-SAS Staff Assistance Station with Call for Help**<br>**NC-SPS Staff Presence Station with Call for Help**<br>3.25 inches Wide X 0.5 inches Deep X 5.25 inches High l<br>Mounts to a 1 gang electrical box or plaster ring. |
| | **NC-PBS-2 Patient Bed Station, Dual Bed**<br>**NC-CS Cancel Only Station**<br>3.25 inches Wide X 0.5 inches Deep X 5.25 inches High l<br>Mounts to a 1 gang electrical box or plaster ring. |
| | **All NC-VP Vandalproof Stations**<br>2.7 inches Wide X <1 inch Deep X 4.5 inches High l<br>Mounts to a 1 gang electrical box or plaster ring. |
| | **NC-SDS Staff Duty Station**<br>3.25 inches Wide X 0.5 inches Deep X 5.25 inches High l<br>Mounts to a 1 gang electrical box or plaster ring. |
| | **PS2437A Power Supply - 24VDC, 3.7 Amps Regulated and Filtered**<br>4" Wide X 1.5" Deep X 5.5" High<br>Mounting is surface mount. Meant to be wall mounted to a plywood back board |

# Tech Works

## NC-Series Nurse Call System

## Planning and Installation Manual

## Back Page