Clinic-Call

Outpatient Medical Facility Communication System

CC2-Series System Planning and Installation Manual

Tech Works new ***Clinic-Call*** is the latest in state of the art digital communications, with beautiful modern station hardware using the latest in LED lighting and energy efficient design. Stations are clearly labeled for their functions, so the learning curve of staff is minimal. Whether it is Room Status, Staff Assistance, or Patient Arrival that is required, all staff needs to do, is recognize a color and push the button.

Tone options can be included at Dome Lights, Annunciator Panels, or as modular stand-alone Tone units to be placed as required throughout the facility to get people's attention. The new designs allow the installer to assign the Tone to any or all colors as required.

Installation is a simple two twisted pair network with wiring running from one station to the next. Because the stations communicate with one another over the network, addressing of the stations associates one station with another station. So if you want a Button panel to light a remote Dome Light, all the installer has to do is set the addresses to match one another. To have an Annunciator represent a group of Buttons and Lights just set the address to match the addresses to be displayed.

BENEFITS

- Easy to Install
- Easy to Program
- Easy to Operate
- Durable Construction
- Two Twisted Pair Cable

Design Information

Power: 11-25 VDC
Standard Electrical Box Mounting
Wiring is Two Twisted Pair

Architects' and Engineers' Specifications

The Light Signaling System shall be state of the art digital communications system using distributed processing to signal the lights and buttons throughout the clinic. Lights shall be energy efficient LEDs for reliable signaling with super bright output.
The system shall operate on two twisted pair parallel wiring. Any system that requires more than two twisted pair wire and is not installer programmable will not be considered under this specification.

The Light Signaling System shall be
Tech Works Clinic-Call

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, 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, feel free, we're here for you..

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Overview

The *Tech Works* Intelligent Data Network Communication allows the status of these buttons and lights to be sent to Intelligent Master/Annunciator and other Substations. The Data Network is two simple twisted pairs of wire from one station to the next.

The Tech Works **CC2-RS-4** is a 4 light, 4 button Intelligent Room Status Station. The four lights/buttons are available in 3 color options, “B” for Bright colors, “N” for No colors (plain white), or “P” for Pastel colors. The four lights when color-coded as Bright colors are Red, Yellow, Green, and Blue. The four lights when color-coded as Pastel colors are Pink, Ice Blue, White and Purple. Lights can be used to easily identify functions or staff.

The **CC2-RS-4** is field programmable for a variety of functions and options. The dip switches allow the installer to choose our Doctor Follow Clinic formats of; first push of a button is a steady lamp, second push is a flashing lamp, and third push is off, or simple on/off either steady lamp or flashing lamp. If you need a combination of both to provide the Red level as an Emergency push for help and the other colors as Doctor Follow, this is also available with the flip of a switch.

The **CC2-DL-44-B** is a stylish, exceptionally bright, call Dome Light and Controller all in one unit. The four lights are Red, Yellow, Green, and Blue. This is an intelligent Tech Works Network device for communication with other intelligent devices on a Tech Works Network. The **CC2-CL-44-B** also has screw terminals for connection of passive devices such as Help buttons and Pull Stations.

The **CC2-DL-44** is field programmable for a variety of functions and options. The dip switches allow the installer to choose our Doctor Follow Clinic formats of; first push of a button is a steady lamp, second push is a flashing lamp, and third push is off, or simple on/off either steady lamp or flashing lamp. If you need a combination of both to provide the Red level as an Emergency push for help and the other colors as Doctor Follow this is also available with the flip of a switch.
An integral tone option is available if ordered with the “T” (Tone) suffix.

The Tech Works **CC2-AN-84-T** is an 8 Column, 4 Row, Lighted, Intelligent Annunciator panel. 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 Emergency Calls. A big window allows for large labels of call points. Labels are back-lit so the call point lights up when a station is active.

This is a digital communication device using Intelligent Control Modules for call point monitoring. Each **CC2-AN-84-T** corresponds to eight **CC2-RS-4** Room Status or **CC2-DL-44** Dome Lights by simply setting matching addresses. Each column represents an exam room status. To display the same information in multiple locations, simply locate the annunciators where desired and set the addresses the same. An Integral Tone unit is built in and can be assigned to sound a beep to draw attention to changes in the light status. The Tone can be disabled by setting a dipswitch.

The Tech Works **CC2-MC-16-T** is a 16-Light and 16 Button Intelligent Master Control panel. By pressing on each of the lighted squares, the lights can be turned on and off. 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. 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.

This is a digital communication device using Intelligent Control Modules for call point monitoring. Each **CC2-MC-16-T** corresponds to four **CC2-CM-4** Control Module or **CC2-RS-4** Room Status Stations by simply setting matching addresses. To have two or more **CC2-MC-16T** talk to each other, simply place two **CC2-MC-16T** annunciators where needed and set the address to match. An Integral Tone unit is built in and can be assigned to sound a beep to draw attention to changes in the light status. The Tone can be disabled by setting a dipswitch.

The Tech Works **CC2-AN-16-T** is a 16-Light Intelligent Annunciator panel. 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. 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.

This is a digital communication device using Intelligent Control Modules for call point monitoring. Each **CC2-AN-16-T** corresponds to four **CC2-CM-4** Control Module or **CC2-RS-4** Room Status Stations by simply setting matching addresses. To have two or more **CC2-AN-16T** display the same information, simply place the **CC2-AN-16T** annunciators where needed and set the addresses to match. An Integral Tone unit is built in and can be assigned to sound a beep to draw attention to changes in the light status. The Tone can be disabled by setting a dipswitch.

The Tech Works **CC2-AN-4-T** is a 4 light Intelligent Annunciator panel available in a variety of color options. The 4 - windows are back lit by white LEDS and can easily be labeled to correspond to staff or locations such as restrooms or functions such as “Patient Waiting”. A built in tone unit sounds to let staff know that there has been a change in the light status of the annunciator.
A Horizontal version of the CC2-AN-4 is available for those that want to view just 4 Exam Rooms of a single color.

The Tech Works **CC2-CM-4** is an Intelligent Interface Module with screw terminals capable of supporting up to four passive push buttons and lights. The **CC2-CM-4** is a surface-mounting device constructed of cold rolled steel with a removable cover plate and is designed for use with normally open momentary contact closures.

The first push of each button lights a *steady* or a *flashing* corresponding light depending on the "S" software selection dipswitch position. A second push extinguishes the lamp. With the "S" switch down, a normally open contact can be monitored, sending a *Steady Light* message to the network when the contact is closed and *Off* when the contact is closed a second time. When the "S" switch is up, a contact is monitored sending a *Fast Flash Light* message when the contact is closed and *Off* when the contact is closed a second time.

The Tech Works **CC2-DL-1-R** is a stylish, all Red, exceptionally bright Nurse Call Dome Light for use with Tech Works Control Modules**.** These are single color passive dome lights designed to work with a variety of Tech Works systems where a simple visual indication is needed in a hallway or above a door or bed. This unit can be paralleled with other passive devices to provide a wide array of output signals associated with user interface buttons.

The Housing is made of white ABS plastic and uses 4 acrylic Lite Pipes to disperse the light from 4 High Power LEDs. A plastic back plate is included to mount to an industry standard 1 or 2 gang electrical box. Wiring screw terminals are provided for LED +/- and Switch +/-. The switch terminals are not active but provide a splice point for parallel wiring to Tech Works button stations.

The Tech Works **CC2-DL-2-RW** is a stylish, Red and White, exceptionally bright Nurse Call Dome Light for use with Tech Works Control Modules**.** These are two color passive dome lights designed to work with a variety of Tech Works systems where a simple visual indication is needed in a hallway or above a door or bed. This unit can be paralleled with other passive devices to provide a wide array of output signals associated with user interface buttons.

The Housing is made of white ABS plastic and uses 4 acrylic Lite Pipes to disperse the light from 4 High Power LEDs. A plastic back plate is included to mount to an industry standard 1 or 2 gang electrical box. Wiring screw terminals are provided for LED-1 +/- and LED-2 +/-.

The Tech Works **CC2-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 call-for-help aCC2ess 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.

An integral call confirmation LED notifies the user that a call for help has been sent. The call confirmation light will be Off if no call is pending, glowing steadily if a Normal Call is pending, and flashing if an Emergency Call is Pending.

This is a passive button-and-light assembly designed for use with active stations like the **CC2-DL-44-B** Dome Light or the **CC2-CM-4** Control Module. Screw Terminals provide wiring connection to the active electronic stations which provide signaling and control for the **CC2-EPS**.

The Tech Works **HUBL** is a recessed Duress Alarm Push Button with confirmation light designed for hidden alarm application under a Judge's Bench, Bailiff or Clerk's Desk, or Cashier/Teller's Counter or Mental Health Counselor’s desk. An easy to "feel" button is recessed inside the unit allowing easy access under stressful situations yet, is impossible to bump and cause aCC2idental false alarms.

An integral call confirmation LED notifies the user that a call for help has been sent. The call confirmation light status will be Off if no call is pending, glowing steadily if a Normal Call is pending, and flashing if an Emergency Call is Pending.

This is a passive button-and-light assembly designed for use with active stations like the **CC2-DL-44-B** Dome Light or the **CC2-CM-4** Control Module. Screw Terminals provide wiring connection to the active electronic stations which provide signaling and control for the **HUBL**.

The Tech Works **CC2-PHS** 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.

An integral call confirmation LED notifies the user that a call for help has been sent. The call confirmation light will be Off if no call is pending, glowing steadily if a Normal Call is pending, and flashing if an Emergency Call is Pending.

This is a passive button-and-light assembly designed for use with active stations like the **CC2-DL-44-B** Dome Light or the **CC2-CM-4** Control Module. Screw Terminals provide wiring connection to the active electronic stations which provide signaling and control for the **CC2-PHS**.

The Tech Works **CC2-PBS** is a 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 Call-For-Help aCC2ess 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.

An integral call confirmation LED notifies the user that a call for help has been sent. The call confirmation light will be Off if no call is pending, glowing steadily if a Normal Call is pending, and flashing if an Emergency Call is Pending.

This is a passive button-and-light assembly designed for use with active stations like the **CC2-DL-44-B** Dome Light or the **CC2-CM-4** Control Module. Screw Terminals provide wiring connection to the active electronic stations which provide signaling and control for the **CC2-PBS**.

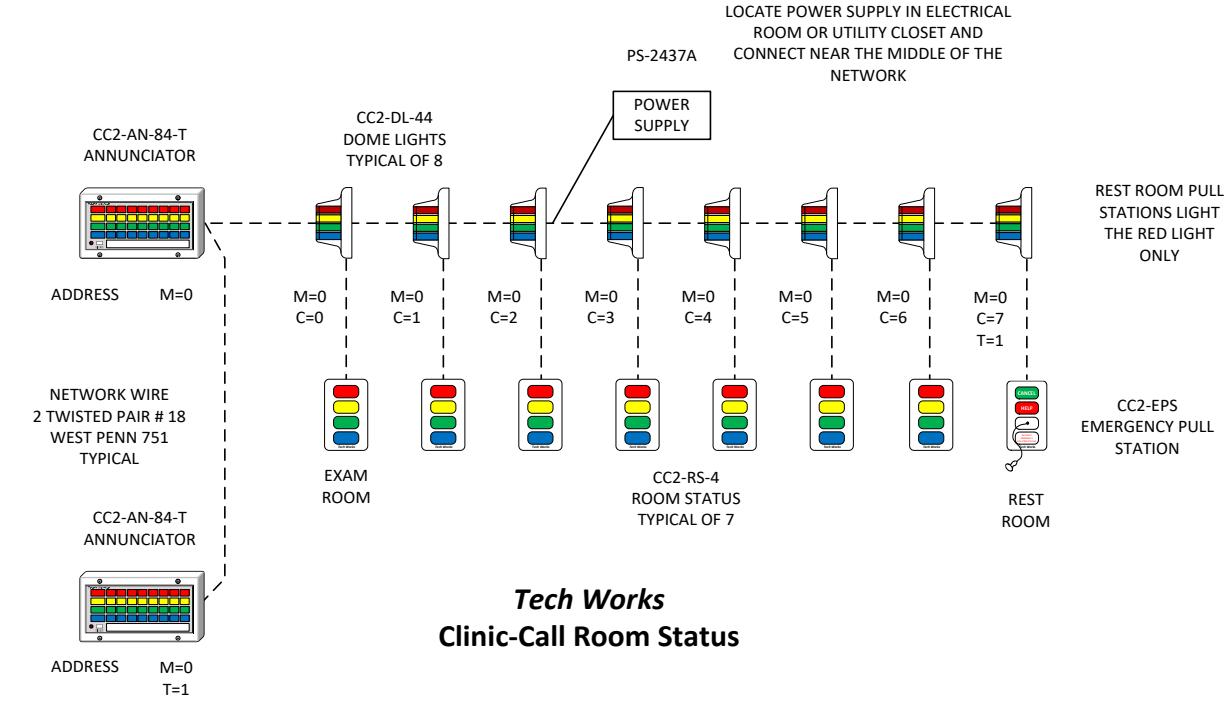
The Tech Works **PBC-7** is a Push Button Call Cord made of high impact thermoplastic with a 7-foot cord and right angle 1/4 inch phone plug. Designed to provide remote push button operation from the **CC2-PBS** generic patient bed station by simply plugging it into the jack. The button is a non-locking, normally open contact, passive assembly, designed for use with Intelligent Substations listed above. The cord set comes with a security clip and is completely shock and waterproof for use in sterile environments**.**

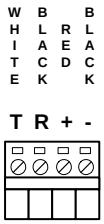
The Tech Works **CC2-ZL-4-B** is a stylish, exceptionally bright Zone Light and Programmable Controller all in one unit. The four lights are Red, Yellow, Green, and Blue. This is an intelligent Tech Works Network device for communication with other intelligent devices on a Tech Works Network. The LEDs display the status of any Substation in groups, as assigned by the integral dip switches.

The **CC2-ZL-4-B** is field programmable for a variety of functions and options. The dip switches allow the installer to choose the group of stations or rooms to represent and the tone to sound or not sound with each group of events.

An Integral Tone unit is built in and can be assigned to sound a beep to draw attention to changes in the light status. The Tone can be disabled by setting a dipswitch.

Basic System Wiring

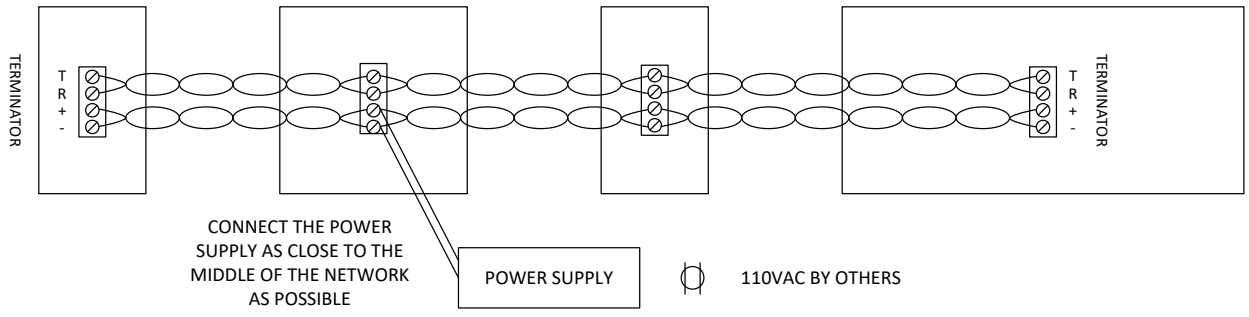




Wiring is four screw terminals to interface to the Tech Works Network. The Network is 2 twisted pair wires. One Pair of wires is Network Communication data and the other pair is power. **Wire must be connected "T" to "T", "R" to "R", "+" to +", and "-" to "-" between devices or from device to device for proper operation.**

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 stand alone or in combination with any other intelligent device. The second pair is 11-25 VDC power in a parallel connection plan.

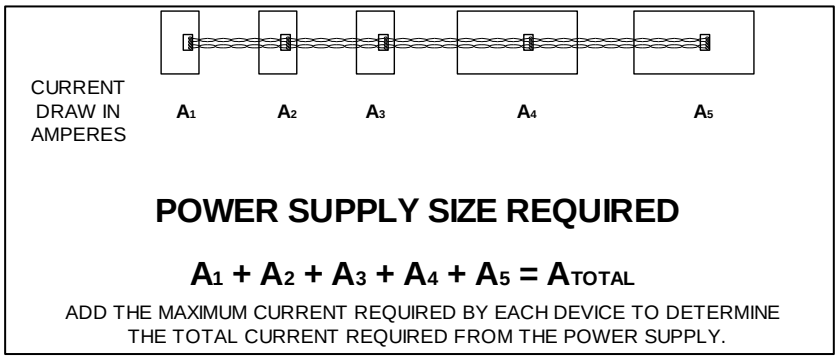


The system is designed to operate on unshielded twisted pair cable from 24 to 18 AWG. The twist of the cable is critical to the proper communication of data on the network to avoid noise interference. Any standard voice grade twist should provide adequate noise cancellation under normal operating conditions.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

Power and Grounding

Tech Works Systems are design to operate as NEC Class 2 wiring with a floating Common and no direct reference to Earth Ground. Circuitry Common is tied to Chassis by a 1 Meg-Ohm resistor.

The power consumption of each component is listed on the individual data sheets. The system is designed to operate on a 11-25 Volt DC power source. Because each device has a built-in voltage regulator, filter, and surge suppressor, the supply voltage can rise and fall by 20% before any loss of service oCC2urs.

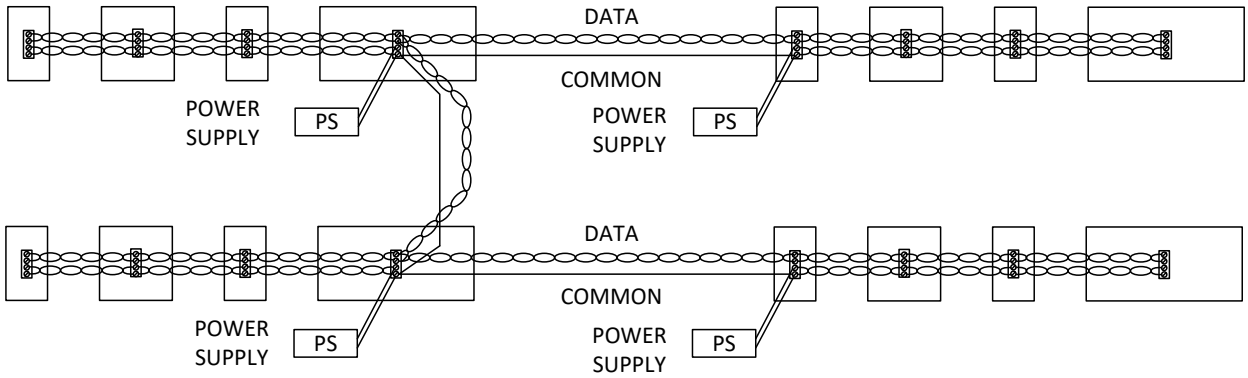


To assure that you select the right power supply, simply add the current consumption of each device designed into each system. It is recommended that you design for this "worst case" operation. This would mean that a system with two Masters and two Annunciators would require 656 mA of current just for the Masters. Each Intelligent Substation requires 60 mA and each Intelligent Dome Light requires 240 mA. Thus, for a system with 12 patient rooms each having a model CC2-RS-4 and a CC2-DL-44 the Substation current requirement would be 3.6 Amps. Add to this the current required for the Masters and Annunciators and this system would require a power supply capable of delivering 11-25 Volts at 5.0 Amps for full operation.

When system requirements exceed the current rating of a single power supply, then multiple power supplies can be used to support the system. Two rules apply to using multiple power supplies on a single Tech Works Network System:

1. Never tie Voltage Positives together.
2. Always tie Voltage Negatives together.

Because the 11-25 Volt Negative is also the data communication Common wire they must be tied together throughout the system for communication to flow throughout the system.

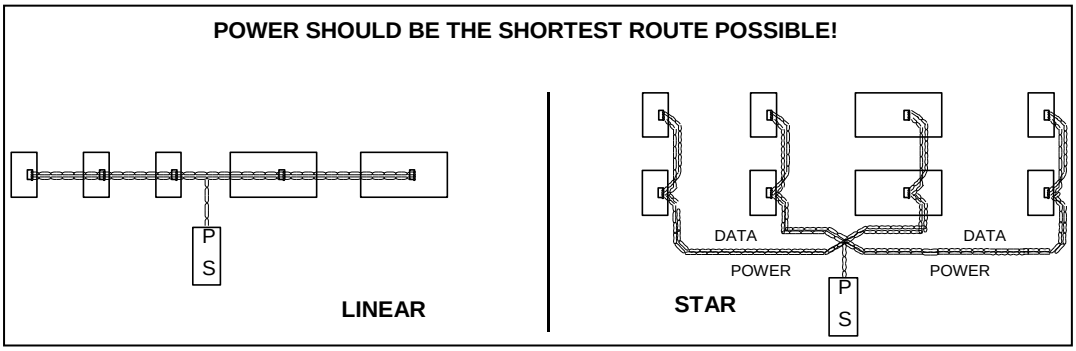


Wire size is very critical to the proper operation of a system. Too large a wire and your price will be too high and you might not get the job. Too small a wire and the system may fail to turn on when you power it up. If you have Stations that come on but then go off, or seem to *flash* on and off and nothing else, this is an indication of too small a wire. Measure the voltage at the back of the station; at least 11 volts DC must be present for the station to boot strap or start and work properly.

WIRE SIZE REQUIRED

$$\frac{V}{A_1 + A_2 + A_3 + A_4 + A_5} > R_{WIRE} \times 2$$

VOLTAGE / CURRENT SHOULD ALWAYS BE GREATER THAN THE RESISTANCE OF THE WIRE X 2



Connect the power supply as near the middle of the network loop as possible to assure the best possible power distribution. The power source for the system may be connected at any device on the network. This would cause three wires to be connected to one pair of screws in the middle of the system or two pair on the end. The power supply should be located at your convenience near an AC power outlet. To assure maximum efficiency, the power source should be as close as possible to the network. Power connections are polarity sensitive so always be certain to maintain the color code and polarity on all connections.

Do the math, before you begin. The Voltage drop over 18 gauge wire happens very quickly. Tech Works products are designed to work with a 25% voltage drop or 9 VDC. The more parts you add onto a system the shorter the wire must be to work correctly.

12 VOLT DC POWER SUPPLY	8 SUBSTATONS @ 100mA + 1 MASTER @	8 SUBSTATONS @ 100mA + 2 MASTER @	8 SUBSTATONS @ 100mA + 4 MASTER @	16 SUBSTATONS @ 100mA + 2 MASTER @
FEET OF #18 WIRE PAIR	VOLTAGE LEFT AT THE END OF THE WIRE			
100	10.90909091	10.71428571	10.34482759	10
200	10	9.677419355	9.090909091	8.571428571
300	9.230769231	8.823529412	8.108108108	7.5
400	8.571428571	8.108108108	7.317073171	6.666666667
500	8	7.5	6.666666667	6

For additional information go to https://techworks-usa.com/dealer-ae/training-materials/

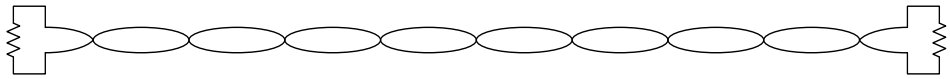
Network Termination

Two major factors contribute to the proper operation of the Tech Works Digital Network.

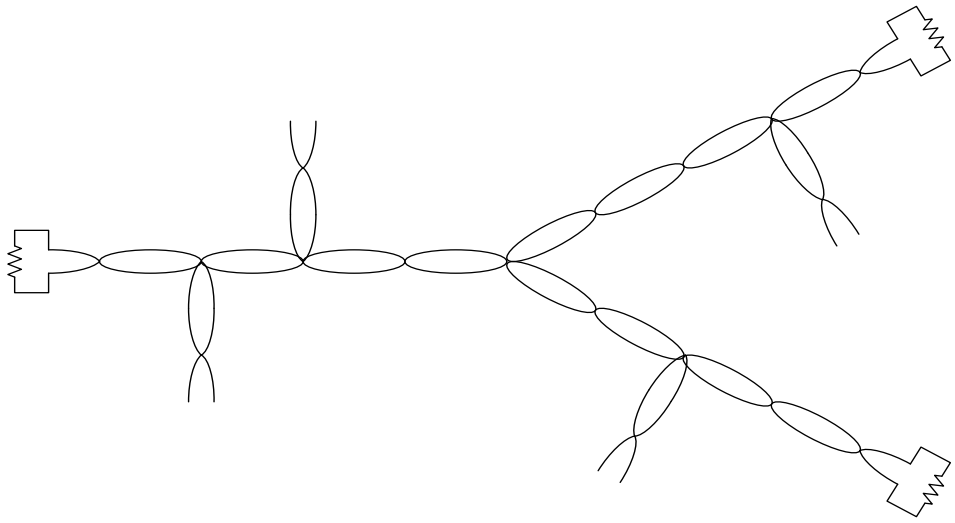
1. Twisted wire
2. Termination

The twisting of the wire is simple and easy. 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 fluorescent 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.



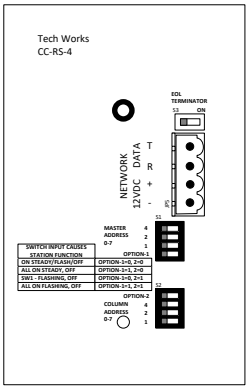
Often times a Tech Works Network does not work out as a perfect loop and looks more like a modified star wiring plan. In that case do not terminate all network ends. Only turn on the Terminator on the longest wire runs of similar length. Leave the short branches unterminated. By terminating a short branch 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.

Programming

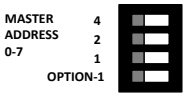
Because each Clinic-Call Network Module or device is a self-contained smart unit with its own CPU, Input / Output controls, and Network Communication interface, it will function independently and react to Network Messages that match it's individual address. Each Network Module whether it is a Dome Light, a Room Status Station, an Annunciator or a Passive Device Control Module will send Network Messages based on how it is configured and react to Network Messages based on how it is configured. All configurations are done through built in dip switches. So how a System functions is based on both how a sending device such as a button panel is programmed to react to a Button being pushed, and how an Annunciator or Dome Light is programmed to react to messages they receive.

Substation Addressing:

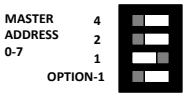
CC2-RS-4



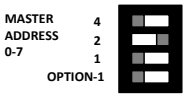
So let's take the CC2-RS-4 Room Status Station as an example. Dip Switch S1 and S2 serve two purposes. First is the address of the unit which determines where it appears on an Annunciator Panel such as the CC2-AN-84-T which has 8 columns. A system can have up to 8 annunciator Groups of 8 stations for a total of 64 CC2-RS-4 on a single system. Addressing is done in binary, so the Master Address is 0-7. Switch S1 sets the Master Address to display this RS-4. Dip switch values are additive. If this RS-4 is to be displayed in more than one location in the clinic, such as a Nurse Station and a second annunciator at the Receptionist location, then all that needs to be done is to set the Master address of the two locations the same and they will display the same stations / exam rooms.



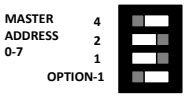
Master address "0" (1)



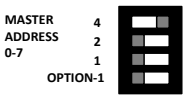
Master address "1" (2)



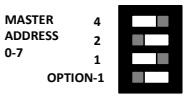
Master address "2" (3)



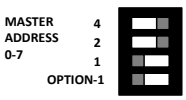
Master address "3" (4)



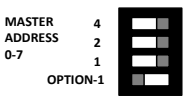
Master address "4" (5)



Master address "5" (6)



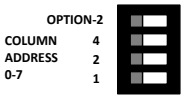
Master address "6" (7)



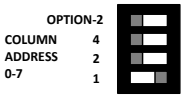
Master address "7" (8)

Substation Column Addressing:

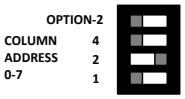
Each Column on the CC2-AN-84-T  corresponds to a CC2-RS-4. The Addressing is done in binary so that Column 1 is address 0 or all dip switches in the OFF or left position. The next Column to the right is Column address 2 and so on until you get to the right most Column which is address 7. The binary address switches are additive so that 1 is the 1 switch ON, 2 is the 2 switch ON, 3 is 1 and 2 switches ON, 4 is the 4 switch ON, 5 is 4 plus the 1 switch ON, 6 is the 4 plus the 2 switch on and 7 is the 4 plus the 2 plus the 1 switches all ON.



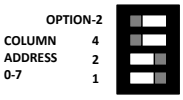
Column 0 (1) or the far left column on the Annunciator.



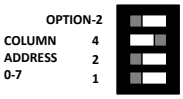
Column 1 (2) or the second column from the left on the Annunciator.



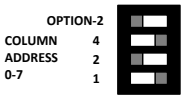
Column 2 (3) or the third column from the left on the Annunciator.



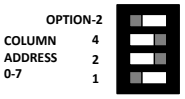
Column 3 (4) or the fourth column from the left on the Annunciator.



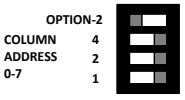
Column 4 (5) or the fifth column from the left on the Annunciator.



Column 5 (6) or the sixth column from the left on the Annunciator.



Column 6 (7) or the second column from the left on the Annunciator.



Column 7 (8) or the far right column on the Annunciator.

Sub Station Option Programming:

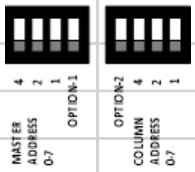
You may have noticed that there are two spare switches on S1 and S2 labeled “OPTION-1” and “OPTION-2”. The setting of these switches determines how the buttons or switch contacts connected to this station will cause the lights in the system to function. When any button is closed it causes an “Event” with a network message, telling the other stations on the network what just happened. By setting “OPTION-1” and “OPTION-2” the installer determines what will be seen when this station is activated.

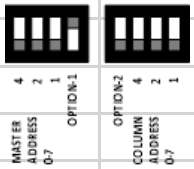
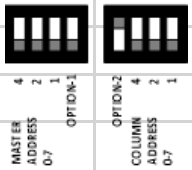
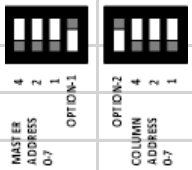
If the unit has the Tone option installed the Tone is a 2000Hz beep that sounds once with a Steady light, with a reminder beep every 10 seconds until the light is turned off, and if a Flashing light is on the Tone will sound in sequence with the Fast-Flashing light. Slow-Flashing lights never sound a tone. The Options switches determine both the light activity associated with a button push and the associated Tone functions on that unit.

A silk screen legend on the back of each station is provided to tell the installer what to expect.

SWITCH INPUT CAUSES STATION FUNCTION	
ON STEADY/FLASH/OFF	OPTION-1=0, 2=0
ALL ON STEADY, OFF	OPTION-1=1, 2=0
SW1 - FLASHING, OFF	OPTION-1=0, 2=1
ALL ON FLASHING, OFF	OPTION-1=1, 2=1

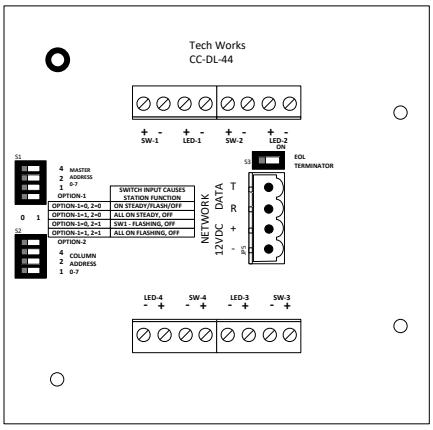
Option Dip Switch Settings

TRI-STATE NO TONE					
LIGHTS/TONE	OPTION 1	OPTION 2	1ST PUSH	2ND PUSH	3RD PUSH
	OFF	OFF			
RED			STEADY	FLASHING	OFF
YELLOW			STEADY	FLASHING	OFF
GREEN			STEADY	FLASHING	OFF
BLUE			STEADY	FLASHING	OFF
TONE			OFF	OFF	OFF

2 STATE STEADY WITH TONE					
LIGHTS/TONE	OPTION 1	OPTION 2	1ST PUSH	2ND PUSH	3RD PUSH
	ON	OFF			
RED			STEADY	OFF	
YELLOW			STEADY	OFF	
GREEN			STEADY	OFF	
BLUE			STEADY	OFF	
TONE			ON	OFF	
2 STATE RED WITH TONE TRI-STATE YELLOW, GREEN, & BLUE					
LIGHTS/TONE	OPTION 1	OPTION 2	1ST PUSH	2ND PUSH	3RD PUSH
	OFF	ON			
RED			FLASHING	OFF	
YELLOW			STEADY	FLASHING	OFF
GREEN			STEADY	FLASHING	OFF
BLUE			STEADY	FLASHING	OFF
TONE			FLASHING WITH RED ONLY	OFF	
2 STATE FLASHING WITH TONE					
LIGHTS/TONE	OPTION 1	OPTION 2	1ST PUSH	2ND PUSH	3RD PUSH
	ON	ON			
RED			FLASHING	OFF	
YELLOW			FLASHING	OFF	
GREEN			FLASHING	OFF	
BLUE			FLASHING	OFF	
TONE			FLASHING	OFF	

Device Connections

CC2-DL-44 Dome Light



The CC2-DL-44 is an intelligent microprocessor based Dome Light station designed to work with our other Clinic-Call and Tech Works Network based products. It wires and programs exactly the same as the CC2-RS-4 Room Status station. If you want a CC2-DL-44 Dome Light to display the status of a CC2-RS-4 Room Status station as a companion at a clinic exam room, then all you have to do is set the dip switches exactly the same on both stations and a change on one unit will automatically cause a change on the other.

CC2-CM-4 Control Module

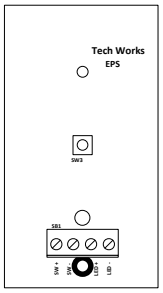
The CC2-CM-4 is an intelligent microprocessor based Dome Light station designed to work with our other Clinic-Call and Tech Works Network based products. Each CC2-CM-4 has 4 Contact Closure Switch inputs and a corresponding LED Light output.

The CC2-CM-4 wires and programs exactly the same as the CC2-RS-4 Room Status station and CC2-DL-44 Dome Light. If you want a CC2-DL-44 Dome Light or a CC2-RS-4 Room Status station as a companion to a CC2-CM-4 so that they are totally interactive, then all you have to do is set the dip switches exactly the same on both stations and a change on one unit will automatically cause a change on the other.

The big difference between the CC2-DL-44 Dome Light and the CC2-CM-4 Control Module and the CC2-RS-4 Room Status station is that the CC2-DL-44 and the CC2-CM-4 Control Module have screw terminal inputs for connecting passive station hardware such as EPS Pull Stations, PHS Push Buttons, PBS Patient Bed Stations (or Cancer Center Patient Stations), and HUBL Hold Up Buttons for mental healthcare. These Passive Stations have no Intelligence and are just a button and a light which count on the support of one of the Intelligent modules with screw terminals to control the lights and send messages to the Network.

Wiring to all passive stations is a simple 4 conductor of 24 gauge or larger. 2 conductors are for the button or switch contact and the other 2 conductors are to power the LED light on the substation. Termination is + to + and – to – as labeled on each device.

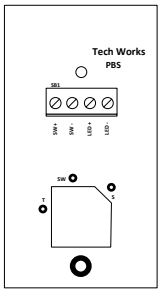
CC2-EPS Emergency Pull Station



The EPS Emergency Pull Station is typically used in public Rest Rooms. It has a 36 inch pull string for easy aCC2ess. The EPS also has a Push for Help button for those that prefer to push instead of pull for Help.

All of the passive stations have 4 screw terminals that match 4 screw terminals on the CC2-DL-44 Dome Light or the CC2-CM-4 Control Module for easy wiring.

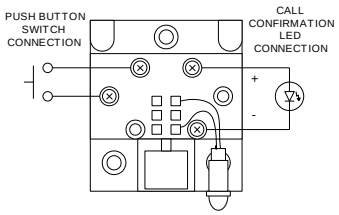
CC2-PBS Patient Bed Station and PHS Push for Help Station



The PBS Patient Bed Station and PHS Push for Help Station share the same circuitry so they look the same from the back or field wiring side.

The PBS Patient Bed Station and PHS Push for Help Station have 4 screw terminals that match 4 screw terminals on the CC2-DL-44 Dome Light or the CC2-CM-4 Control Module for easy wiring.

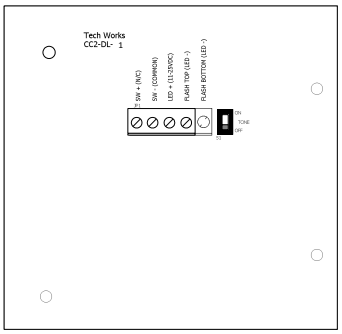
HUBL Hold Up Button with Light

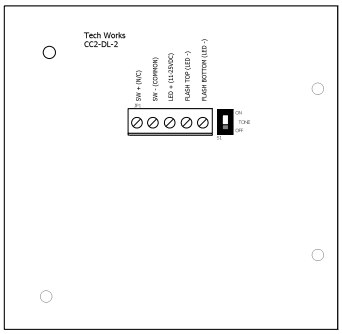


The HUBL Hold Up Button is a surface mounting plastic button with call confirmation light. The top snaps off to reveal the wire termination screws.

The HUBL has 4 screw terminals that match 4 screw terminals on the CC2-DL-44 Dome Light or the CC2-CM-4 Control Module for easy wiring.

CC2-DL-1 and DL-2 Passive Dome Lights

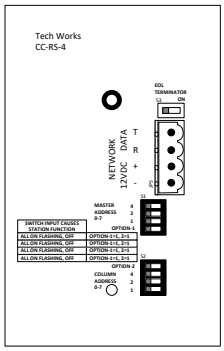




The **CC2-**DL-1 and **CC2-**DL-2 Passive Dome Lights are designed to provide a simple light output associated with any passive station

Wiring is a pair of wires to power the dome light and a control conductor for each color of light. So the CC2-DL-1 is a single color with a single input while the CC2-DL-2 is 2 colors with 2 inputs. The SW+/- and LED +/- simply connect in parallel with the SW+/- and LED +/- of the other passive stations and connect to the SW+/- and LED +/- on the CC2-DL-44 or CC2-CM-4 Control Module.

Annunciators
CC2-AN-*4-*T Four Light Annunciator Panel with Tone



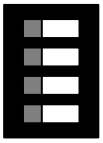
The **CC2-AN-4-T** is based on the same hardware as the CC2-RS-4 but includes a Tone unit and does not have any buttons to send signals. It addresses exactly the same as the CC2-RS-4 (see "Substation Addressing") and is available in a variety of color options. The basic **CC2-AN-4-T** is designed to be a small 4 point annunciator for a single CC2-CM-4 or CC2-RS-4.

Horizontal Version

What some customers want is, a way to see just a single color in a group from up to 4 Exam Rooms. So if a person or function is represented by the color Yellow, they only want to see the Yellow light associated with 4 rooms that they care about. The **CC2-AN-H4** is designed to display a single color from 4 rooms as displayed horizontally on the Main Annunciator. The **CC2-AN-H4** is shipped as the N (No Color, White) and with a "T" for Tone installed. The face plate as shipped is White but other colors are available upon request.

The Master address dip switch S1 assigns the Master normally, just like any other Tech Works Network device.
The Option-1 switch has the special function of turning the Tone associated with any Steady Light On and Off.

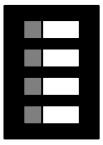
4
2
1
Option-1



"Option-1" is the Steady Light Tone On/Off switch

The Column address dip switch is used to set what the CC2-AN-H4-NT will display from the selected Master Groups.
Column dip switch S2 labeling

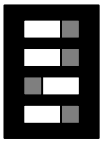
Option-2
4
2
1



"Option-2" is the Flashing Light Tone On/Off switch
4 is the Group switch. Down is to display Column 1-4, Up is Column 5-8
Both 2 & 1Off = Red or First Row Displayed
Both 2 & 1Off = Red or First Row Displayed

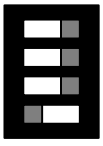
As shown above or default would be Tone Off, Left hand Columns 1-4, Red or Top Row displayed.
Below are the various options:

Option-2
4
2
1



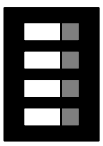
Flashing Light Tone On
Column 5-8
Off
On = Yellow or Second Row Displayed

Option-2
4
2
1



Flashing Light Tone On
Column 5-8
On = Green or Third Row Displayed
Off

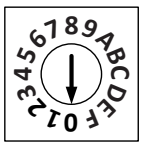
Option-2
4
2
1



Flashing Light Tone On
Column 5-8
Both On = Blue or Fourth Row Displayed
Both On = Blue or Fourth Row Displayed

The **CC2-AN-16-T**, **CC2-MC-16-T** and the **CC2-AN-84-T** share a lot of programming functionality, and a variety of color and labeling options are available.

Master addressing:

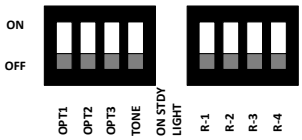


MASTER ADDRESS

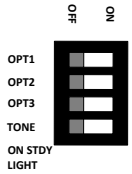
A rotary switch is provided for direct selection of the Master address to be monitored. Simply turn the arrow until it points at the Master address of the stations you want to display. Only the addresses 0-7 are active at this time in Clinic Call. Master addresses 8-F (16) are reserved for future expansion.

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.

Annunciator Option Dip Switches

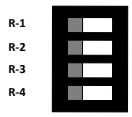


The Option dip switches S2 and S3 determine how each annunciator reacts to signals from remote stations. They also determine how and if the Annunciator sends messages to the network.



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. 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 sound 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 sound every 20 seconds.
A Slow Flashing light will never have an associated tone.

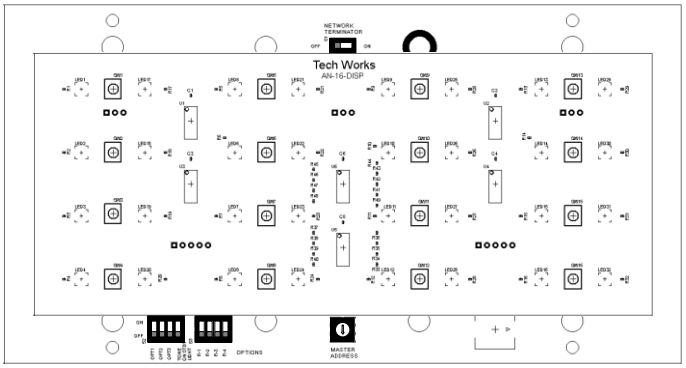
Option Switches on the **CC2-AN-84-T** activate the Tech Works Doctor Follow feature to assist provider in knowing which Patient / Exam Room is “Next” and helping staff know where the provider is. For example, if 3 yellow lights are on in a row that indicates there are 3 patients in 3 different rooms for Doctor “Yellow”. The first one to have been turned on is changed to a *“Slow Flash”* to indicate that is the “Next” patient for Doctor “Yellow”. When that yellow light is turned *“Off”* the “Next” yellow light to have been push will start slow flashing.

What is Doctor Follow or “Next” Patient Tracking, sometimes known as “Room Sequencing”?

Master Stations monitor the sequence of button pushes in a horizontal row. Each doctor is assigned a color, the Master indicates to the doctor which patient is to be seen “Next” and sends that flashing signal to the Dome Lights and Room Stations. For example, if 3 yellow lights are on in a row that indicates there are 3 patients in 3 different rooms for Doctor “Yellow”. The first one to have been turned on is changed to a *“Slow Flash”* to indicate that is the “Next” patient for Doctor “Yellow”. When that yellow light is turned *“Off”* the “Next” yellow light to have been push will start slow flashing.

Pressing the corresponding button on the exam room status station CC2-RS-4 activates these lights on the Master. If it is desirable to change the priority level of an exam room, or which one is “Next”, simply push the corresponding exam room status button twice within 2 seconds (double push) and that room will become the next patient for that color. By double pressing any button that station of that color will automatically start slow flashing or become “Next”. All other sequencing remains unchanged. Only the station that is double pressed moves to the top of the queue.

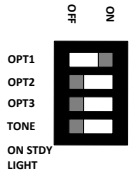
CC2-AN-16-T and CC2-MC-16-T Sixteen Light Annunciator Panel with Tone



The **CC2-AN-16-T** and **CC2-MC-16-T** have 4 columns of 4 lights. Each column corresponds to a CC2-RS-4 Room Status station or a CC2-DL-44 or both at an Exam Room location. This is a 4 Exam Room annunciator with a built in Tone Unit.

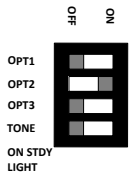
When connected with up to 4 of the CC2-CM-4 Control Modules the **CC2-AN-16-T** can be a 16 point annunciator representing signals from up to 16 separate locations.

CC2-AN-16-T



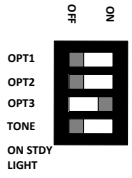
OPT1

On the **CC2-AN-16-T** the OPT1 switch activates the Dual Doctor Follow (DDF) function. This splits an 8 column Master in half so that the colors are tracked across 4 Columns or Exam Rooms. In a lot of clinics, a group of providers will work as a team in 3-4 Exam Rooms. By splitting the 8 columns in half, one group of providers can be tracked across columns 0-3, and a second group of providers can be tracked across columns 4-7.



OPT2

On the **CC2-AN-16-T** the OPT2 switch activates the classic Doctor Follow (DF) function. Each Color tracks across all Columns. So all 8 Rooms are working together with the same providers.

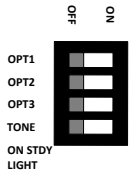


OPT3

On the **CC2-AN-16-T** the OPT3 switch activates the “Group Shift” which changes which half of a CC2-AN-84-T the unit will correspond to. With OPT3 OFF the CC2-AN-16-T will correspond to the left 4 columns of a CC2-AN-84-T or Columns 0-3. With OPT3 ON the CC2-AN-16-T will correspond to the right most columns of a CC2-AN-84-T or Columns 4-7.

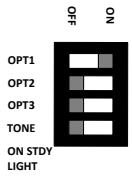
CC2-MC-16-T

With the **CC2-MC-16-T OPT1** and **OPT2** switches work together to produce a wide range of button functionality similar to that of the CC2-RS-4 Room Station but in a larger panel of 4 stations side by side.



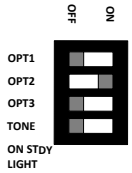
If the Option Switches **OPT1** and **OPT2** are both OFF, then the station will function as a 3 state light output with the sequence:

1st Push of a button or contact closure will cause the associated light to turn on Steady.
2nd Push of the same button or contact will cause the associated light to change to Fast Flashing.
3rd Push of the same button or contact will cause the associated light to turn OFF.



If the **OPT1** Switch is ON and the **OPT2** Switch is OFF, then the station will function as a 2 state light output with the sequence:

1st Push of a button or contact closure will cause the associated light to turn on Steady.
2nd Push of the same button or contact will cause the associated light to turn OFF.



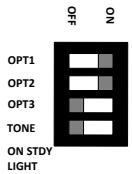
If the **OPT1** Switch is OFF and the **OPT2** Switch is ON, then the station will function as a 2 state light output from SW1 (Red Button) and 3 state light output on SW2 (Yellow), SW3 (Green), SW4 (Blue) with the sequence:

SW1:

1st Push of a button or contact closure will cause the associated light to turn on Fast Flashing.
2nd Push of the same button or contact will cause the associated light to turn OFF.

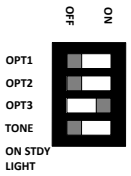
SW2, SW3, SW4:

1st Push of a button or contact closure will cause the associated light to turn on Steady.
2nd Push of the same button or contact will cause the associated light to change to Fast Flashing.
3rd Push of the same button or contact will cause the associated light to turn OFF.



If the **OPT1** Switch is ON and the **OPT2** Switch is ON, then the station will function as a 2 state light output with the sequence:

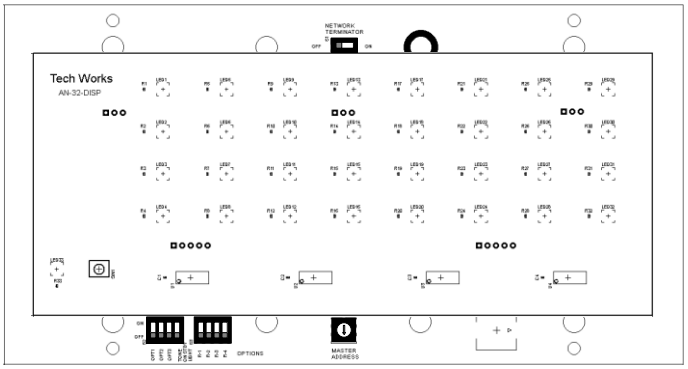
1st Push of a button or contact closure will cause the associated light to turn on Fast Flashing.
2nd Push of the same button or contact will cause the associated light to turn OFF.



OPT3

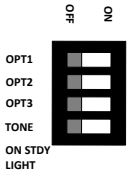
On the **CC2-MC-16-T** the OPT3 switch activates the “Group Shift” which changes which half of a CC2-AN-84-T the unit will correspond to. With OPT3 OFF the CC2-AN-16-T will correspond to the left 4 columns of a CC2-AN-84-T or Columns 0-3. With OPT3 ON the CC2-AN-16-T will correspond to the right most columns of a CC2-AN-84-T or Columns 4-7.

CC2-AN-84-T
Eight Column (Exam Room) Four Row (Color) Light Annunciator Panel with Tone

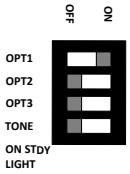


The **CC2-AN-84-T** has 8 columns of 4 lights. Each column corresponds to a CC2-RS-4 Room Status station, or a CC2-DL-44, or both at an Exam Room location. This is an 8 Exam Room annunciator with a built in Tone Unit.

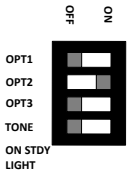
An integral Silence button is provided to stop the Tone until another signal is received. The silence button only stops the current sound. Any subsequent signals will sound a tone if the annunciator is programmed for Tone output.



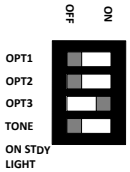
With all Option switches OFF on the CC2-AN-84-T, the annunciator will simply display the status of the lights from stations with matching addresses. No messages will be sent to the network and no tracking functions will oCC2ur. This is simply an annunciator panel with no output or control functions.



OPT1
On the **CC2-AN-84-T** the OPT1 switch activates the Dual Doctor Follow (DDF) function. This splits an 8 column Master in half so that the colors are tracked across 4 Columns or Exam Rooms. In a lot of clinics a group of providers will work as a team in 3-4 Exam Rooms. By splitting the 8 columns in have one group of providers can be tracked across columns 0-3 and a second group of providers can be tracked across columns 4-7.

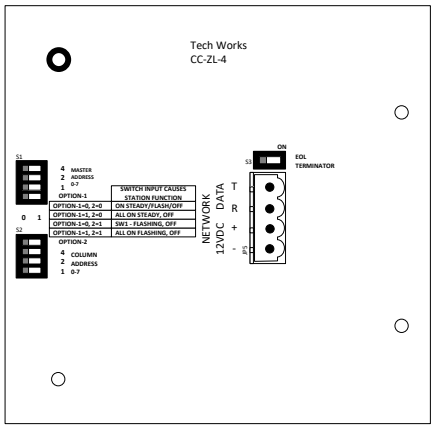


OPT2
On the **CC2-AN-84-T** the OPT2 switch activates the classic Doctor Follow (DF) function. Each Color tracks across all Columns. So all 8 Rooms are working together with the same providers.



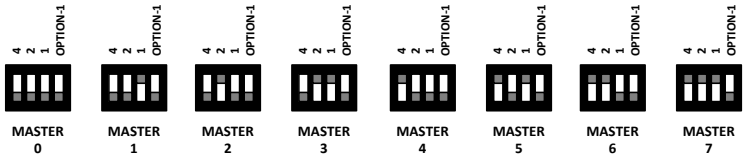
OPT3
On the **CC2-AN-84-T** the OPT3 switch activates the Expanded Doctor Follow (EDF) function. Expanded Doctor Follow is for the clinic where a group of providers covers more than 8 exam rooms. With this software the “Next” feature covers two Masters or sixteen columns representing sixteen Exam Rooms. The first Master in address sequence tracks the eight columns it displays plus the next eight addresses. This means that Master 3 will track the 8 rooms on it plus the “Next” rooms of Master 4 for a total of sixteen rooms.

CC2-ZL-4-T

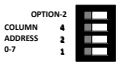


The Tech Works CC2-ZL-4-B is an intelligent microprocessor devise capable of displaying the status of multiple stations on any Tech Works CC or NC Series system. The LED-1 output is associated with the top horizontal row of a light annunciator, the LED-2 output is associated with the second row, LED-3 with the third row, and LED-4 with the fourth row. A single CC2-ZL-4-B can display the status of a group of 4, 8, 16, 32, or 64 columns. It monitors the network and if a substation on the system sends a message indicating a light status the Zone Module looks to see if it is assigned to display that station's status. If this station is programmed to display a message it checks to see if any other assigned station is currently active with a higher priority signal. A flashing light is always a higher priority than a steady light. If the only signals on the system assigned to a Zone Module are steady then the LED output will be steady. If a substation assigned to a Zone Module has a Flashing Light signal on that row then that light output will be Flashing on the Zone Module.

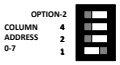
Each Zone Module has 2 sets of dipswitches which set the address and function of the unit. The Master address sets the Master or lowest address Master for the Zone Module to Monitor. The Master address should match the address of the substations to be monitored 0-7.



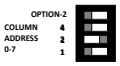
The dipswitch labeled "Column" is used to set the functional operation of the Zone Module. Each unit has the ability to monitor the first half of a single Master (Column 0-3), the second half of a Master (Column 4-7), a whole Master (all 8 columns), two whole Masters (the Master address +1), four whole Masters (the Master address +1, plus the Master address +2, plus the Master address +3), or All Master addresses. These functions are accomplished as follows.



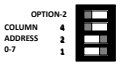
The first half of a single Master (Master 0-7) (Column 0-3).



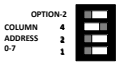
The second half of a Master (Master 0-7) (Column 4-7).



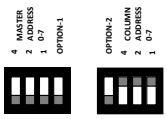
One whole Master (Master 0-7) (all 8 columns).



Two whole Masters (Master 0-6) (the Master address +1).



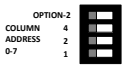
Four whole Masters (Master 0-4) (the Master address +1+2+3).



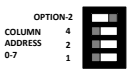
All Master 8 addresses, All Stations.

Tone option on the CC2-ZL-4-T

Option 1 switch turns the tone ON and OFF



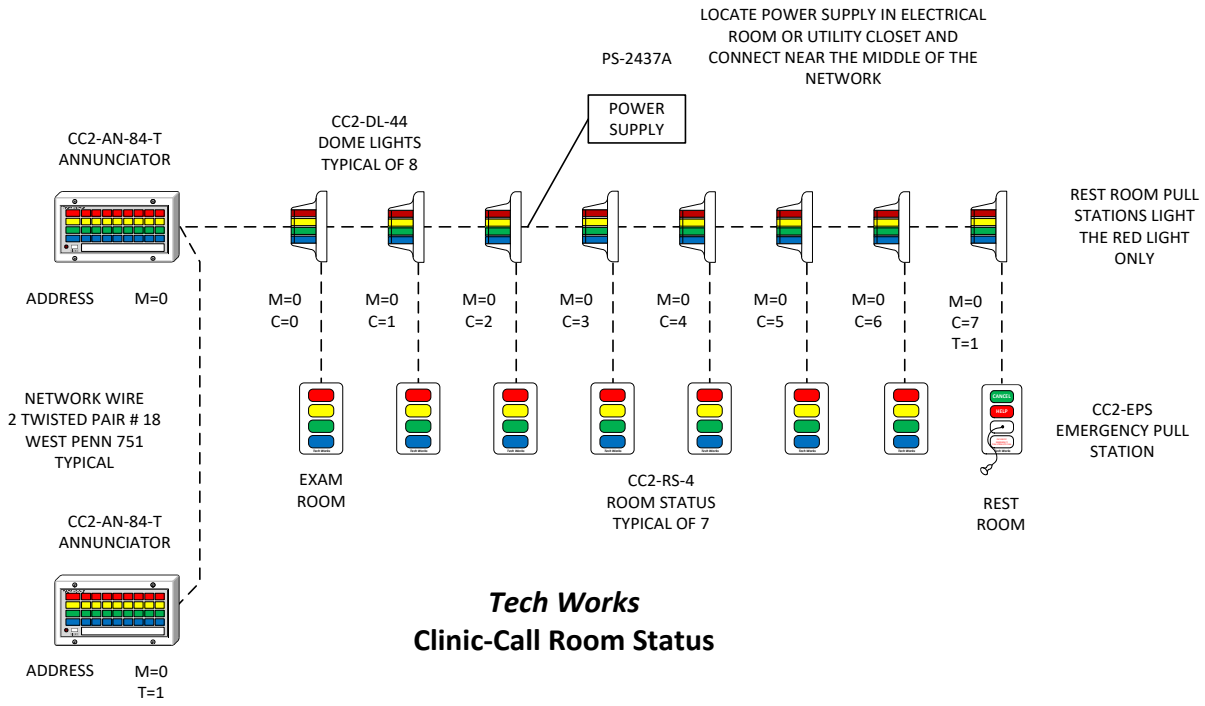
When the Option-2 switch is in the OFF position, any "Steady" Light is a single tone and any "Flashing" Light is a repeating tone. If only steady lights are ON, a reminder tone sounds every 15 seconds.



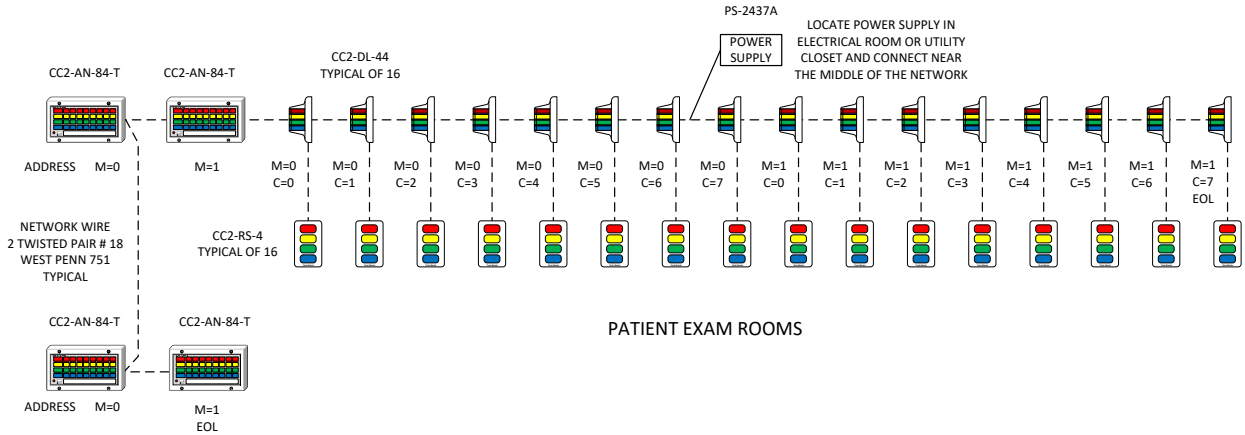
When the Option-2 switch is in the ON position, the tone only sounds on a Red or LED 1 "Flashing"

Typical Applications

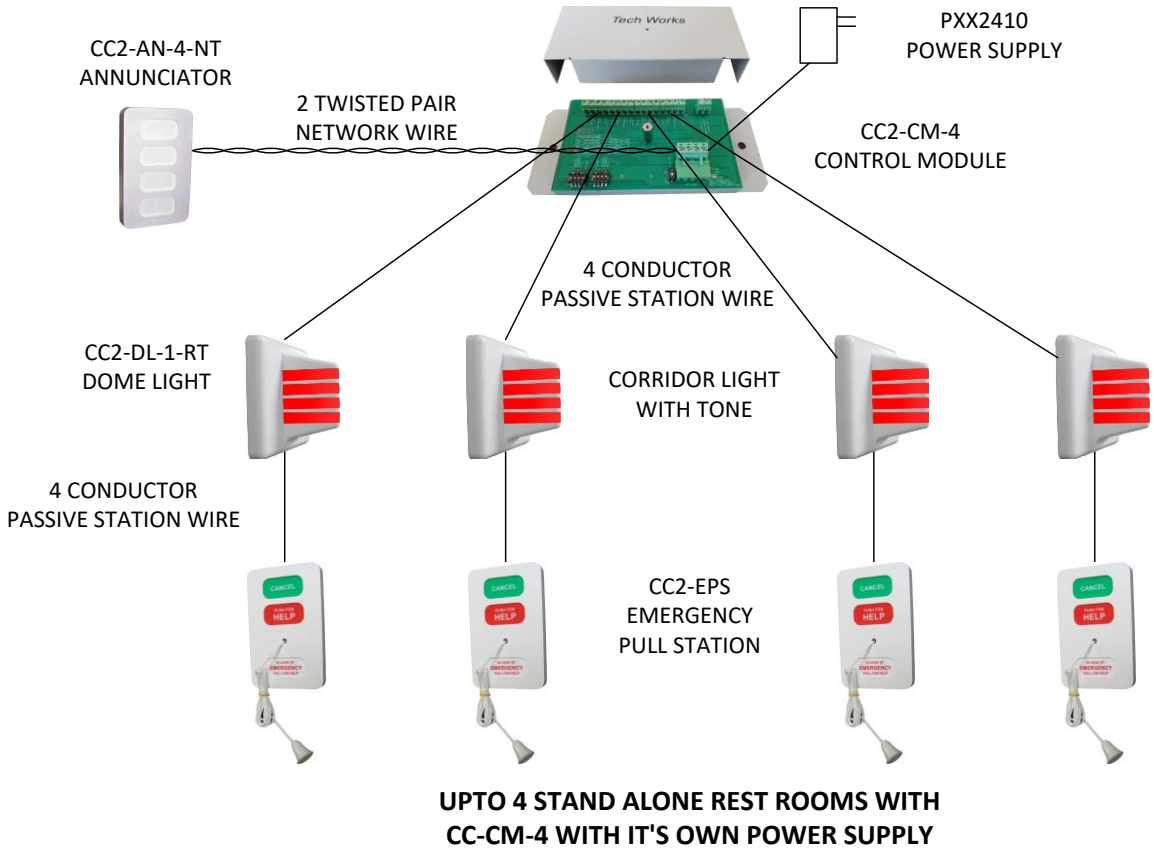
Typical Medical Office Building - 8 Exam Room Status System



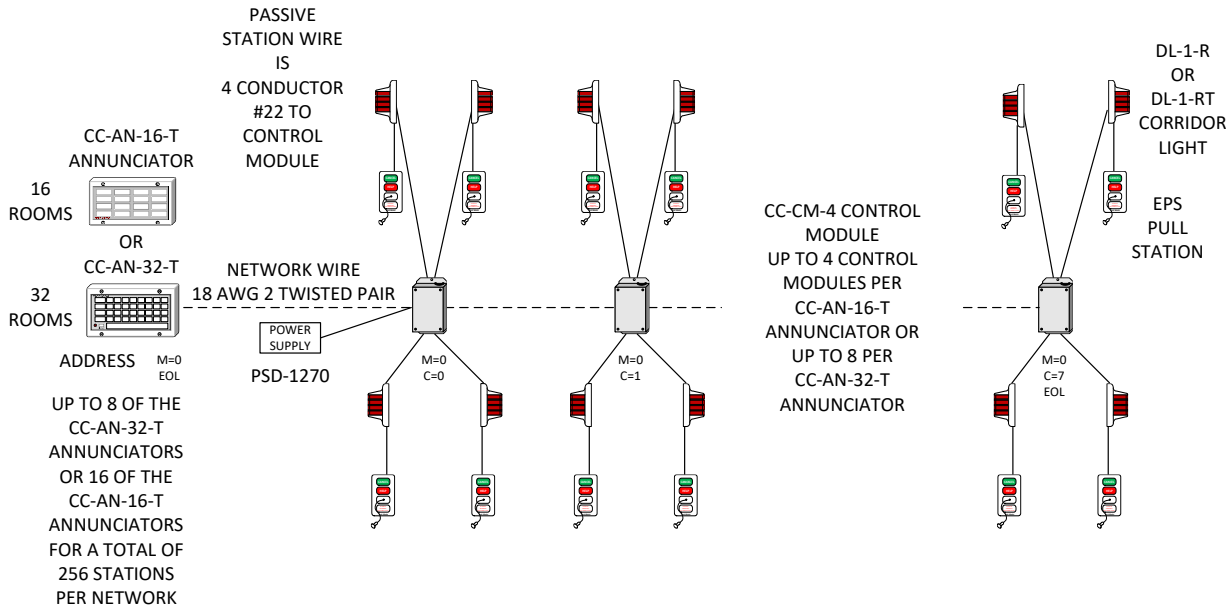
Typical 16 Room Clinic Room Status System



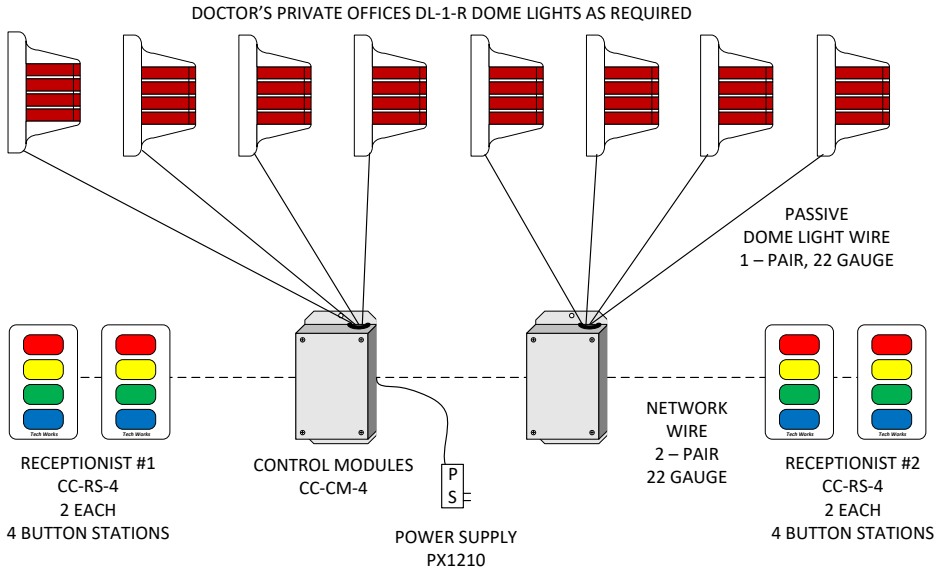
Typical Emergency Call System



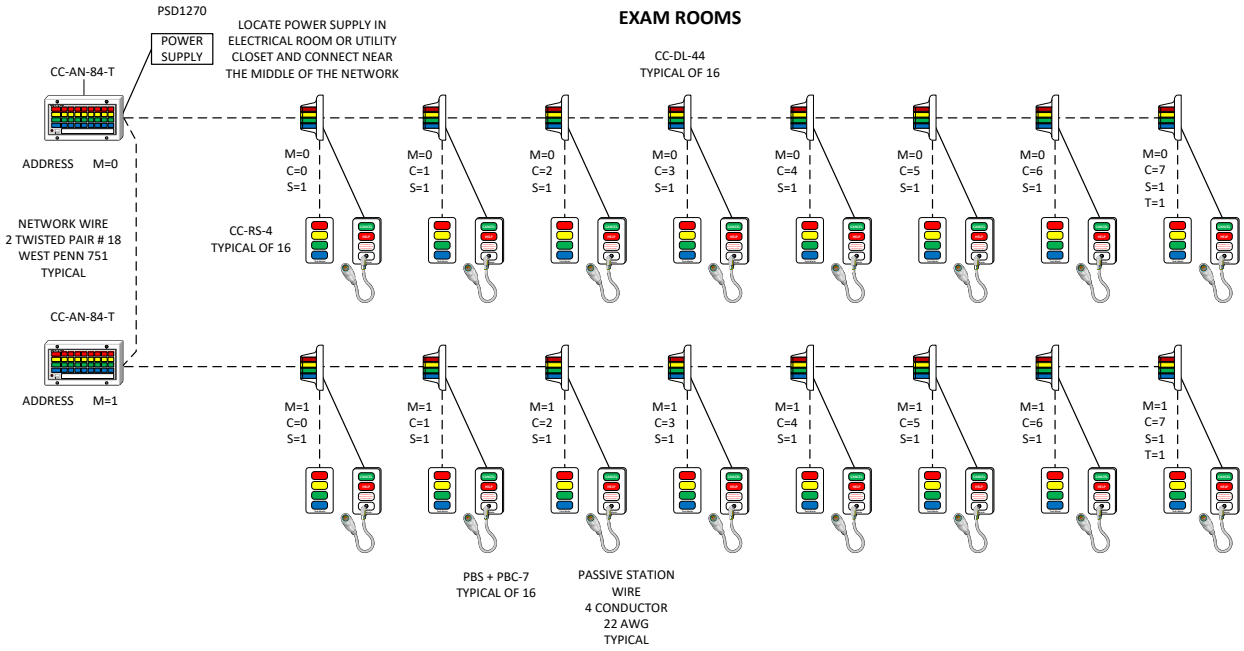
Typical 32 point Emergency Call System



Typical Patient Arrival Signaling System to Doctor's Private Offices



Typical Outpatient Clinic for Cancer Treatment or Dialysis



Tech Works

CC2-Series Clinic Call System

Planning and Installation Manual

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