



03/20/14

# EZCommunicator 2 Wire Navigator APS System Installation Manual

## This Manual

A copy of this manual and the companion Operation Manual should be kept in the traffic signal controller cabinet. The information in this manual applies to EZ Communicator systems containing version 4.00 and later firmware. If you have existing product with version 3.XX, it may be upgraded to take advantage of the new features using either; the EZ510 Security Box (preferred), or a PC and USB cable. All of the necessary files for upgrading are available from your local distributor, or by contacting Polara Tech Support at [www.polara.com](http://www.polara.com) in the Support section. When upgrading, it is important to update the CCU2EN and every EPBS on an intersection. For more information, see the "How to Update Firmware in the E-Navigator System" section in the Operation Manual.

## EZ APS Tool box

Polara offers the EZ APS Tool box PC application which provides a graphic user interface for all the available maintenance and monitoring functions available for the EZ Communicator Navigator system. This includes live status monitoring, a health log, a calendar function, system setup, audio file uploading, and firmware updating. The software has built in guidance for every operation. This software is available at [www.polara.com](http://www.polara.com) in the Support section. A standard USB A/B Cable is required and an optional Ethernet cable may be used at the CCU2EN.

## Part Number Descriptions

- CCU – Original 2 Wire CCU (No Ethernet Capability)
- CCU2EN – EZCommunicator CCU with Ethernet
- PBS – Original 2 Wire Push Button Station (N2xxxx-x)
- EPBS – EZCommunicator 2 Wire Push Button Station (EN2xxxx-x)

## System Installation

Please refer to the companion Operation Manual for a detailed description of all products, functions and settings.

**Please read these installation instructions completely before beginning an installation.**

EZ Communicator 2-Wire Navigator System communicates from the Central Control Unit (CCU2EN) to the individual Push Button Stations (EPBS) with digital data over the two low voltage wires. These wires also supply all of the power for the EPBSs. To ensure proper operation, the total "Loop Resistance" from the Interconnect Board to the farthest EPBS and back should be less than 1.5 ohms. For example, with 14 AWG wire, 600 feet of wire will have a resistance of 1.5 ohms which means that the wire run to the farthest pole must be less than 300 feet to keep the "Loop Resistance" less than 1.5 ohms. High resistance splices in runs of any length can cause a problem.

## Mode Switch

The CCU2EN back panel has a two position mode selection switch. The positions are labeled EN2 and N2. In order to take advantage of all the latest features of this system, it must run in EN2 mode. Also, every installed push button station must be an EPBS. The information in this manual applies primarily to operation in EN2 mode. For more information, see the section "Backward Compatibility" on page 9 of this manual.

## Setting IDs

Each push button station must have a unique ID assigned, using either the Polara E-Configurator or by using Polara's EZ APS Tool box software - with a PC connected to the EPBS. The ID consists of a letter matching the connected channel and a number from 1 to 4. If an EPBS ID is set to NONE (factory default), the only sound it will play is a special voice message "SET ID". If an EPBS has an ID and is moved to a different CCU2EN channel, its ID will be automatically changed to NONE.

## Setup Button

After setting EPBS IDs the SETUP button on the back of the CCU2EN must be pressed (for at least 2 seconds) for the CCU2EN to recognize them. A green light will appear on the front panel for each EPBS found. If you have set IDs and neglect to press this button, the system will periodically play a special voice message "PRESS SETUP BUTTON". For more information, see section "CCU2EN/Navigator Self Check Feature" on page 9 of this manual.

## Security Code (password)

Each CCU2EN contains a password to protect the system from unauthorized tampering. The factory default password is AAAA. It is important to change this to a different password of your choice. This can be done with the E-Configurator, or by PC, using Polara's EZ APS Tool box software. If the password is not changed, the system will periodically play a special voice message "CHANGE PASSWORD". Firmware updates will not affect the password. **Note: When using the EZ APS Tool Box connected to a PBS that is in N2 mode, you will not be able to change the password. To change the password of a CCU2EN in N2 mode you must plug into the CCU2EN directly using USB or use the handheld EZConfigurator at the button.** For more information, see the "How to Reset the Security Code" section in the Operation Manual.

## Fault Light

If you see the fault light on the front of the CCU2EN, one or more detectable faults have occurred. You may connect a PC to the CCU2EN and use the Polara EZ APS Tool box software to read the contents of the Health Log to determine the type of fault(s) detected. In order to clear the fault light and fault relay, the CCU2EN must be power cycled. For more information, see section "Network Configuration" on page 12 of this manual.

## Software Information

Polara EZ APS Tool box software provides a full set of monitoring and maintenance utilities to support the EZ Communicator 2 Wire Navigator system. Remote access is possible using the CCU2EN Ethernet port. Please see "Network Configuration" on page 12 for complete instructions on installation and operation.

Default Ethernet Address for Status Page:

<http://192.168.1.223/>

Software must be pre-installed on user's computer prior to visiting the intersection. Some software may require an internet connection to complete. See pages 11-15 for more information.

For audio message and firmware updating, a USB A/B Cable is required to connect your computer to the ENavigator System.



## The Rest of the Manual ☺

If you have read this far, we applaud you. If you still have questions about the products, please read the rest of the manual.

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## Brief Description of Installation

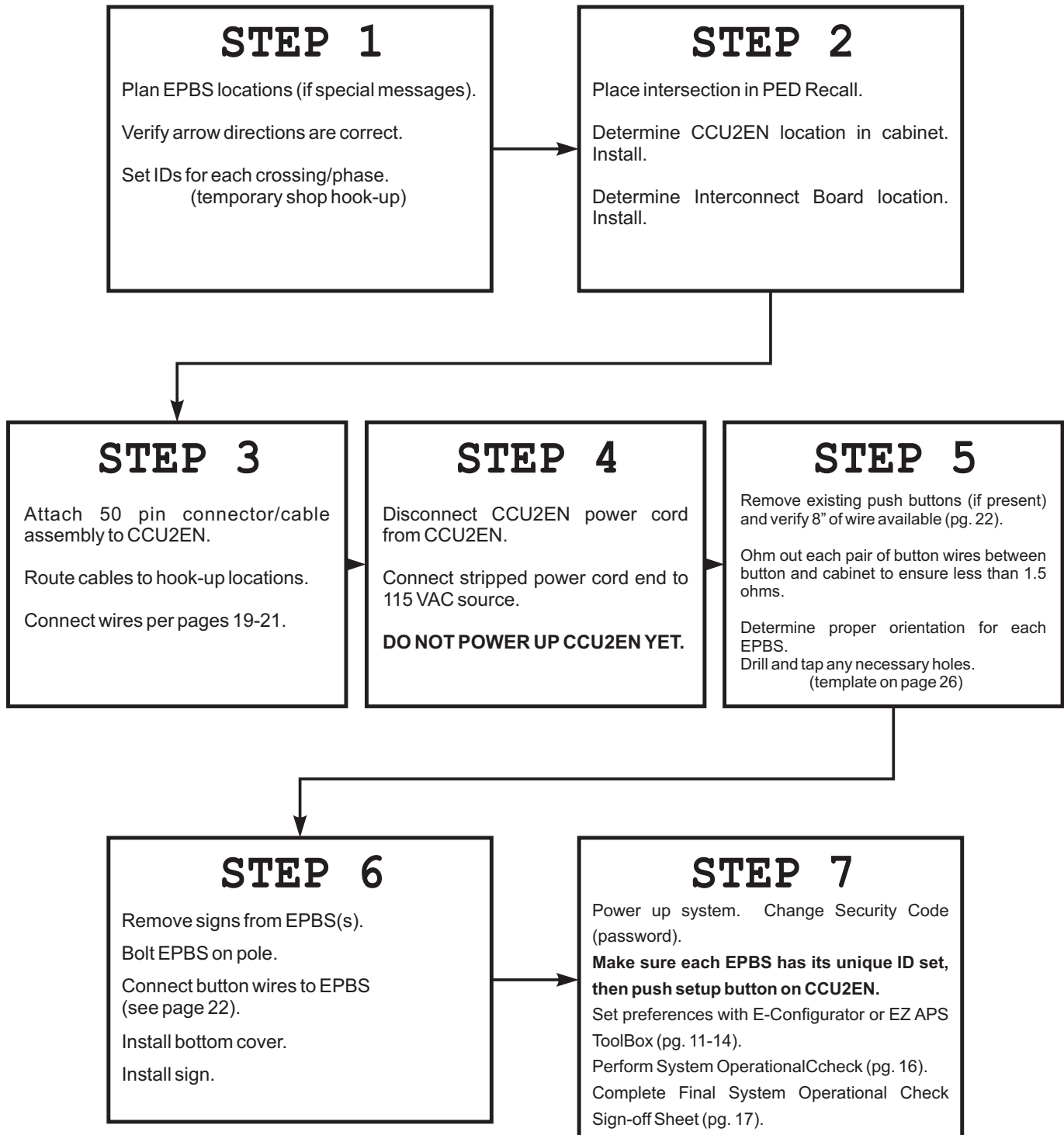
Installation involves installing the EZCommunicator Central Control Unit (CCU2EN) in the intersection control cabinet and the EZCommunicator Push Button Stations (EPBS) in the field. The EPBSs replace any existing pedestrian push buttons mounted on poles. For complete overview wiring diagram, see page 27.

Polara's recommended wiring is to have a dedicated pair of wires from the traffic cabinet to each button, or a dedicated pair to each crosswalk set/phase/channel of buttons. This method of wiring ensures the system fails safe should any conductor open.

Inside the traffic signal control cabinet, the CCU2EN is wired between the push button wires and the PED button inputs to the traffic signal system. The CCU2EN is also wired to the PED WALK and DON'T WALK load switches and to a constant source of lightning protected AC line voltage. Additional wiring, for advanced functions, is optional. The EPBSs receive operating power from the CCU2EN over the two wires connected to them and send & receive digital data over the same wires. **NOTE: This means that you can never operate a contact closure button on the same wires as Navigators, or temporarily substitute a standard push button for a EPBS unless you rewire the cabinet back to normal for that phase and use all standard push buttons for that phase. Also, do not use crimp-on forks on solid wire. If the crimp becomes loose, data may not transfer even though voltage conducts. Polara recommends that installers secure solid wire directly to terminal screws.**

If the existing push button wiring is good and mounting holes do not need to be drilled and tapped, an experienced two man crew should be able to install an 8 push button intersection in 4 hours or less.

# Summary of Installation Steps



**\* Black Case Configurators are not compatible with EPBS systems.  
Grey Case EConfigurators must be used.**

## Preparation

Prior to the actual installation, some planning is required. The system supports 4 pedestrian phases. **You must establish a relationship between the intersection PED phase numbers and the CCU2EN channels A, B, C and D. Each CCU2EN channel can support up to four EPBSs.** It is recommended that, at a minimum, a diagram be drawn showing the pole unit locations along with phase and channel information. A intersection diagram worksheet is provided on page 18. If possible, it is recommended that you configure the system with a controller in the shop before installing in the field (See System Configuration section in the Operations Manual). This way, only volume adjustments should be needed in the field. Tag/Mark each unit with its ID and location. Ex: NW Corner, Crossing Broadway, A1. **Proper assignment of individual IDs is critical for proper installation.** If an EPBS has a custom message provided by Polara, it will have a label on the back denoting the street it is crossing. You must make sure you install each at its proper location and update or confirm its ID once installed.

In order for the Ethernet functions of the CCU2EN to be accessed remotely, an Ethernet connection must exist in the cabinet which connects to the central office network. If Ethernet for remote access will be utilized, it is recommended that the IP address be chosen and programmed prior to installation in the field. See "Advanced Network Configuration" on page 14 of this manual. If no Ethernet connection exists in the cabinet, and you want to configure system features and settings using the Ethernet port on the CCU2EN, see setup instruction on page 12.

The EZ APS ToolBox is a single PC based application program used to program custom messages, manage configuration settings, and update firmware. A USB A/B cable, PC running at least Windows XP, and Windows .Net Framework 4.0 or later are required to use the EZ APS ToolBox.

If custom voice messages need to be programmed, it is recommended that they are programmed during the system configuration in the shop before installation in the field. However, if units are to be programmed in the field, a laptop with the proper software and voice messages must be prepared prior to installation on the intersection. See section "Preparing Custom Voice Messages" on page 11 of this manual for preparation and programming instructions.

Note: The Navigator can be ordered with an extra terminal block for connection to an auxiliary push button such as for a bike lane push button, etc... Call Polara or your local distributor for details on the External Button option.

Note: **If a system is installed while it is raining you must keep water from getting inside the Push Button Stations and CCU2EN. Warranty is void due to failures caused by internal water damage. If units must be opened to change the arrow direction, we recommend this be done indoors prior to installation.**

## Installing CCU2EN in Traffic Control Cabinet

1. Place the intersection in Ped Recall mode since the Ped buttons will not be available.
2. Choose a location inside the traffic control cabinet for the CCU2EN. It can sit on a shelf on top of an existing piece of equipment, or mount on the wall utilizing the optional mounting plate Polara offers (order P/N 850-172).
3. Plug in and secure the 50 pin cable assembly to the CCU2EN.
4. Refer to the wiring information on pages 19-21 for the following connections:

- 4.1 Disconnect ped button field wires inside cabinet keeping track of phase information. We recommend you label each wire by phase and confirm the phase as you disconnect them. Remove each push button from poles. Twist together and wire nut the wires at the pole, then ohm out each pair of wires between each push button location and the traffic cabinet. Record each reading for future reference. If any measure greater than 1.5 ohms, you might experience a communication issue on that channel. Polara provides an Interconnect Board for clean wire connections. **It is important to note that there are two versions of interconnect boards.** The older version (850-186) has four on board relays used to place calls in the event of a power failure on a channel. The newer style interconnect board (850-317) is smaller in size and does not have relays or pluggable fuses installed. **The 850-186 is OK to use with any version of CCU or CCU2EN. The newer 850-317 Interconnect board is intended for use ONLY with the CCU2EN. The 850-317 Interconnect board should NEVER be used with the older CCU as there are no built in safety features/relays in these older CCUs.** Connect the push button field wires (+ and -) per phase. Connect the appropriate channel wires from the 7 conductor CCU2EN cable #1.
- 4.2 Connect the appropriate conductors on cable #2 to the ped inputs. Be careful that the bare ends do not touch any 115 VAC feeds.
- 4.3 **Warning:** The following connections are made to the ped head 115 VAC Walk and Don't Walk load switch feeds. We recommended you power down the Ped Heads (pull the load switches) or place the intersection in flash before making these connections. Connect the appropriate conductors on cable #4 to the appropriate Ped Head load switch outputs (by phase) (See pg. 21).
- 4.4 Note that the CCU2EN power cord has a quick disconnect coupling. Unplug this before making the following connection. Connect the CCU2EN power cord to the same lightning protected 115 VAC source and circuit breaker that powers the traffic controller. Note: It should not be connected to a GFI protected outlet.
- 4.5 If Ethernet for remote access will be utilized, connect a Cat-5 cable from the back of the CCU2EN to the network source (typically a network switch in the cabinet).
- 4.6 **Double check all of the connections per the wiring diagram. The CCU2EN is ready for power up, but do not power it up until all the Push Button Stations are installed.**

## Installing Push Button Stations on Poles

Determine if Navigator EPBSs have special messages pre-programmed. If there is a label on the back with street names, then they have special messages. Determine location for each per the street being crossed.

The recommended button height from the ground to the center of the push button is approximately 42" and maximum is 48". It can be lower, but should not be higher.

Note: The visually impaired use the face of the push button station and the arrow on the button to determine the direction of travel. The arrow should point across the street in the direction of travel and, when mounted, the sign of the PBS should be parallel with the crosswalk. To ensure proper mounting orientation place the outside of your forearm against the sign with your fingers straight. Your arm should be parallel to the crosswalk and point to where the crosswalk ends across the street. If your arm does not point to where the crosswalk ends, remount the EPBS so it does. If you are mounting an EPBS



to a fluted pole, Polara offers a mounting plate that helps achieve parallel mounting. Contact our sales department for more information.

Remove the sign from each EPBS by removing the 4 screws holding the sign. Remove the bottom cover by removing the two screws on the bottom of the unit. If the arrow direction is correct, there is no need to remove the main cover. If the arrow needs to be rotated, remove the 9 screws holding the main cover. A Torx screwdriver bit is required for two of the screws. Keep the main cover away from metal pole or other metal objects; the magnet may pull the diaphragm assembly out and possibly damage it if it comes too close to other metal objects. Place the main cover on a flat surface with the backside facing you. To change the arrow direction, loosen the 4 screws that hold it 1-2 turns, then slowly press on the front of the button and turn the button diaphragm counter-clockwise. The button diaphragm assembly should pop out. Orient the arrow in the proper direction. Place the diaphragm so each tab goes under the screw head and into its pocket, then tighten the 4 screws. The screws must not pinch and bind the diaphragm to the cover inhibiting its movement. Reinstall main cover and 9 screws.

For brand new installations where mounting and wire holes do not pre-exist in the poles, determine desired location and button height, then mark the location for two ¼-20 mounting holes for bolting push button to pole. These two holes should be 6" apart. From the bottom hole, measure down 7" and mark for wire hole. Drill and tap the two mounting holes to ¼-20. Drill wire hole to 3/8" minimum. See page 26 for template diagram. Do not drill with the EPBS open near the pole. The magnets on the speaker and button will attract shavings potentially causing problems.

For poles with existing push buttons, if they are frames they often already have the two ¼-20 holes 6" apart and a wire exit hole approximately 3.44" lower. These will work for EPBS installation as long as a minimum of 8" of wire can extend from the wire exit hole.

For poles with existing push buttons mounted on a cup, as long as a minimum of 8" of wire can extend from the wire exit hole, and the height of the Navigator's button does not exceed 48" above the ground, or the local authority's specific height, the EPBS can mount using the existing wire hole. Mark, drill and tap the ¼-20 holes where needed.

If the wires cannot extend 8" from the pole, the EPBS can be raised so the wire hole exits just above the bottom of the EPBS as long as this does not put the center of the button greater than 48" above ground level. If it is greater than 48", a new (lower) wire exit hole and the appropriate 6" spaced ¼-20 holes must be drilled.

Refer to diagram on page 22 for the following step. Once you have resolved the wire length and hole location issues, tape the two wires so they are flat, parallel and oriented so they correspond to the +/- terminals on the EPBS. Start taping 1.5" from the end of the wires and tape all the way up to past where the wires will enter the pole so the tape protects the wires from shorting to sharp edges on the wire exit hole.

The unit can be bolted to the pole prior to connecting the wires to the unit. Double check that the wires are the proper length by holding EPBS up to mounting holes in pole and routing wires down the channel on the back of the EPBS. The wires will wrap around the opening in the bottom of the EPBS to the front where they will connect to the terminals on the EPBS. Screw in the two provided ¼-20 bolts and washers in the two locations on the EPBS until the unit is loosely held in place to the pole. Connect button wires to terminals **observing polarity**. Press any excess wire into the cavity above terminal block or route the excess wire back into the pole. Make sure the wires are within the guide channel of the EPBS (not pinched between pole and EPBS), then tighten the two bolts until the EPBS is secure on the pole. If custom voice messages need to be programmed into the unit, follow the instructions from section "Preparing Custom Voice Messages" on page 11. Install the bottom cover onto the EPBSs by securing the two screws on the bottom of the unit.

If the EPBS is going to be mounted on a wooden pole, mounting diagrams are available for download at <http://www.polara.com>. You can also contact Polara for more information at (888) 340-4872.



## CCU2EN/Navigator Self Check Feature

The EZCommunicator 2-Wire Navigator system has a self-check feature. This feature identifies any unresponsive push button stations and places a constant ped call on the corresponding phase.

This feature uses the unique identification programmed into each push button station (A1, A2, etc...). **System operation is possible prior to programming the IDs; however, the self-check feature will not work as intended. You must program each button with its own unique ID prior to setting up the self-check.** See the Operation Manual for details regarding setting the ID. Once the EPBS IDs are set, the system ID memory is set up by pressing the SETUP button on the rear panel of the CCU2EN. **Also, the setup button must be pushed for the system to function properly.**

**Any time there is a change to the installed IDs on an intersection, the SETUP button must be pressed again.**

After setup, the status LEDs on the front of the CCU2EN should be lit to reflect the presence of each of the installed Push Button Stations. If they are not lit, the installation and/or ID settings need to be checked and/or the setup button pushed.

The self check is performed every 30 seconds. The CCU2EN individually checks each ID that was found at setup time. If a particular ID does not respond, it is immediately queried again, up to 5 times. During the query, the status LED is off. If there is no response following the 5th attempt, the CCU2EN will flash the status LED and power off the channel for 10 seconds. This is done in order to reset the EPBSs on that channel. If the same ID does not respond at the next self check, the CCU2EN will place a constant ped call on that phase. The status LED will continue to flash, identifying the unresponsive ID.

## Backward Compatibility

The EZCommunicator Central Control Unit can be used with older 2-Wire Navigator PBSs (N2). Preferably, the Navigator version should be 1.12 or later. Likewise, EN2 Navigator EPBSs may be used with older CCUs.

The CCU2EN has a compatibility MODE switch on the rear panel. Position N2 must be used whenever one or more older PBS is connected to the CCU2EN. N2 mode sets the CCU2EN to supply 22 volts DC to the Navigator PBSs, while EN2 mode changes the voltage to 18 volts DC. The EPBSs recognize the difference in voltage and operate in N2 mode whenever the voltage is 22. In N2 mode, the operation is identical to older PBSs. If all are EPBSs the EN2 switch position must be used to activate EN2 features.

In the event that programmed IDs are changed such that a particular ID is no longer used or the CCU2EN is putting in a locked call, the CCU2EN ID memory can be refreshed by a press of the SETUP button.

Note: In the case of a knockdown requiring an EPBS replacement, a PBS can be used only if there are three push button stations or less on each channel. The MODE switch can be changed to N2 mode and the intersection will operate. However, if there are four EPBSs on any channel, an EPBS must replace the knockdown [or an EPBS must be removed from each channel with more than 3 EPBSs installed] in order to meet the requirements listed for N2 mode.

## Description of CCU2EN Front Panel Status Indicators

	A	B	C	D
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
PWR	○	○	○	○
WK	○	○	○	○
DW	○	○	○	○
PED CALL	○	○	○	○
	○	○	○	○
IN1	IN2	IN3	EV	FAULT

1. **A1, A2, A3, A4, B1, etc...** - The individual LEDs are lit when a self check response is received from the associated EPBS. All individual LEDs are turned off briefly during the self-test cycle. Flashing identifies non-responsive PBS/EPBS ID.
2. **PWR (Power)** - Shows when power to pole units is on for a given phase. In general, power should be on whenever either WALK or DON'T WALK is on. Power is off in the absence of both WALK and DON'T WALK. This light also blinks whenever data is sent or received between CCU2EN and EPBS.
3. **WK (Walk)** - Shows presence of WALK signal for a given phase.
4. **DW (Don't Walk)** - Shows presence of DON'T WALK signal for a given phase.
5. **PED CALL** - Pushing any EPBS on a given phase should cause the light to turn on for the duration of the push. In the event of a non-responsive PBS, the PED CALL light will remain on.
6. **IN1-IN3 (General Purpose Inputs)** - Shows when a given input is on.
7. **EV (Emergency Vehicle Input)** - Shows when any emergency vehicle input 1 through 4 is on.
8. **FAULT** - Indicates that the system self test has detected a problem, a Low Voltage Condition has been identified on a channel, or a Ped Station Monitor conflict occurred on a channel. The fault relay is active when this LED is lit. See Fault section in the Operation Manual for more information.

## Preparing Custom Voice Messages

Programming custom messages in the field requires a laptop, USB A/B cable and the Polara EZ APS Tool Box software. The software must be installed and messages prepared prior to installation of the EPBSs on the intersection.

### AUDIO FILE PREPARATION

If the custom audio files have been prepared by Polara, they should be ready for use in the EZ APS Tool Box software.

Note: Polara cannot provide support for studio recording or audio processing and manipulation. If you are recording your own messages, it is recommended that it be done by an experienced audio technician.

The EPBS messages must be saved as uncompressed PCM .WAV files in: Mono, 16-bit, 16kHz format. Each message should be trimmed and saved as individual files. Messages should be normalized to 100% to ensure the messages play at a proper volume. Messages have a limited amount of space available for programming. Custom Voice on Location and Custom Walk 1 both have a limit of 8 seconds each.

### EZ APS TOOLBOX SOFTWARE INSTALLATION

Insert the supplied installation media and extract the installation files. Run setup.exe to install the EZ APS Tool Box Software (contact Polara for a download link to the installation files necessary, if not already provided). Follow the on-screen instructions for installing the software. Note: Microsoft .NET Framework 4.0 or later is required in order to run the software. The installation file will prompt you to install the .NET Framework if it is not already installed. This may require an internet connection to complete successfully.

### PREPARE INTERSECTION SAVE-FILES

The EZ APS Tool Box software will only program the messages in which you enable for programming. In most cases, only the Voice on Location and Custom Walk #1 need to be programmed for a custom intersection message set.

Open the EZ APS Tool Box software, and navigate to the Audio Programming Tab.

Choose the program mode which matches your desired custom intersection message set. The "Custom Messages" option is most commonly used.

Click the "Browse" button next to the audio messages you wish to program and find the .wav file appropriate for each message. Press the "Play" button to verify that the message is correct and plays properly. The filename will appear green if the message is formatted correctly and will appear red if there is a formatting error. Mouse-over the filename to view the errors associated with the .wav file so you can correct them in your audio editing software. Once the messages have been verified to be correct, press "Update EPBS Audio" to begin programming.

#### Wave Messages:

Voice on Location: (12 sec.)	Play	
<input checked="" type="checkbox"/> C:\18618_BroadwayGrand_VOL.wav		Browse...
Custom Walk #1: (8 sec.)	Play	
<input checked="" type="checkbox"/> C:\18618_Broadway_WALK.wav		Browse...

If you are preparing messages for programming later on the intersection, use an EZ510, click "Create EZ510 Audio File" button to the custom message set and name the file appropriately to ensure no confusion when programming units in the field. Repeat the entire process for every message set desired. See the EZ510 Operation Manual for the recommended steps to follow for preparing and programming custom messages for programming in the field.

## Network Configuration

The IP address of the CCU2EN has been preset from the factory to 192.168.1.223. This makes it simple for a connection to a laptop using a network crossover cable. Most IT departments can provide a crossover cable. Crossover cables can also be purchased at most electronics and office supply stores.

If you are connecting the CCU2EN to an internal network for remote access, the unit must first be connected directly to a computer in order to set the desired network parameters.

### Connecting CCU2EN To A Laptop

Insert a crossover cable into your computer's Ethernet port. Connect the other side of the crossover cable to the Ethernet port of the CCU2EN (no additional software is required). Lights should turn on on both connectors.

In order for your computer to be able to communicate with the CCU2EN, you must set the TCP/IP settings on your computer to the same subnet as the settings on the CCU2EN. You can accomplish this by following these steps:

Windows XP:

Open Control Panel.



Click Network and Internet Connections.



Click Network Connections.



You should see a list of the available connections on your computer. We want to change the settings on the connection which corresponds to the Ethernet port on the computer. This is typically named "Local Area Connection".



Right click on "Local Area Connection" and choose Properties.

Click on "Internet Protocol (TCP/IP)" and click Properties.

If "Use the following IP address" is selected, make a note of all settings so you can reset your settings when you are finished.

Click "Use the following IP address" option and enter the following:

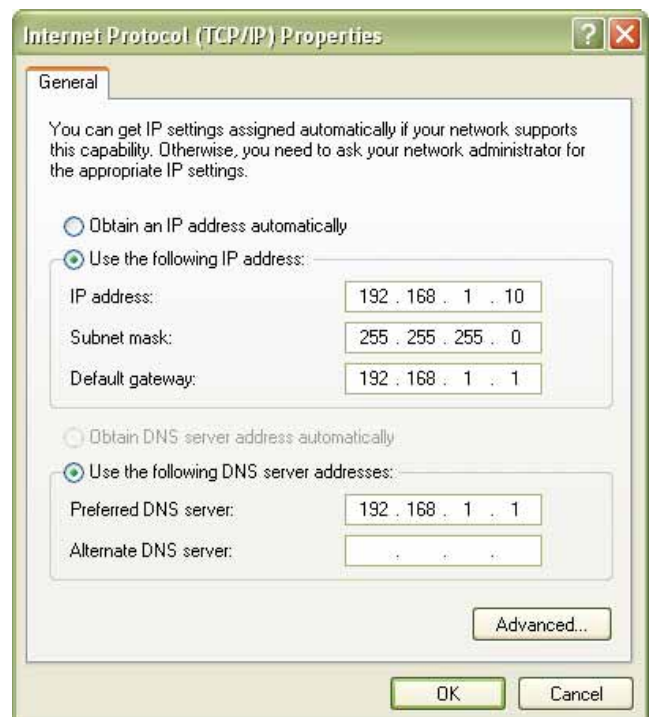
IP address: 192.168.1.10

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

Preferred DNS server: 192.168.1.1

Click OK on both windows.



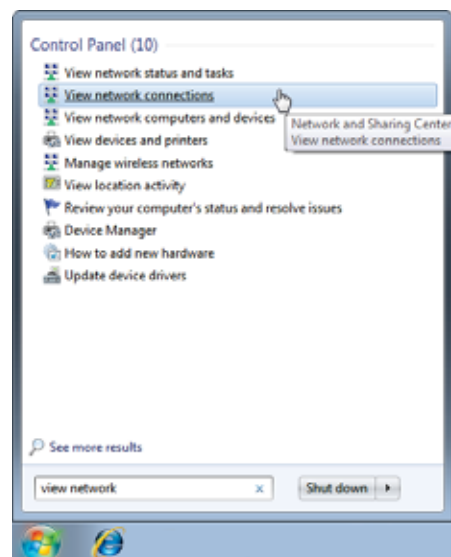
Windows Vista or Windows 7:

Click on the Start Menu Icon.

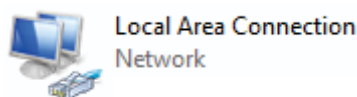
Type in the search field: view network

Click on View network connections.

You should see a list of the available connections on your computer. We want to change the settings on the connection which corresponds to the Ethernet port on the computer. This is typically named "Local Area Connection".



Right click on "Local Area Connection" and choose Properties.



Click on "Internet Protocol Version 4 (TCP/IPv4)" and click Properties.

If "Use the following IP address" is selected, make a note of all settings so you can reset your settings when you are finished.

Click "Use the following IP address" option and enter the following:

IP address: 192.168.1.10

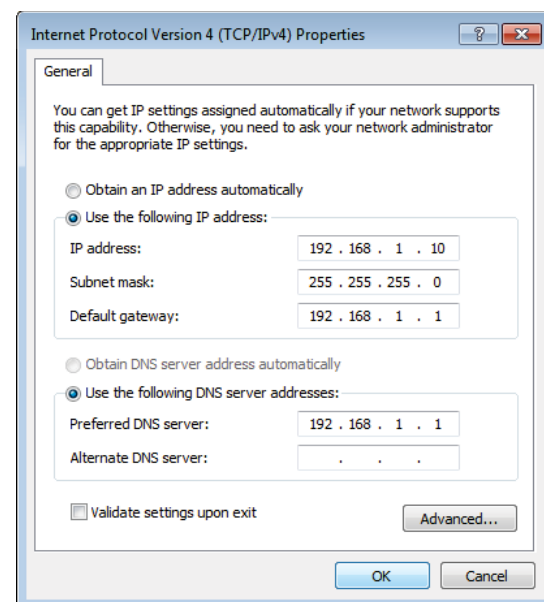
Subnet Mask: 255.255.255.0

Default Gateway: 192.168.1.1

Preferred DNS server: 192.168.1.1

Click OK.

Click OK.



You should now be able to browse to the CCU2EN status page. Open your browser of choice and type this address in the address bar:

http://192.168.1.223/

## Advanced Network Configuration

The CCU2EN comes with the IP address statically assigned to 192.168.1.223 to allow for easy configuration from a laptop. The following section details the process for customizing the network configuration for use when connecting to your internal network.

Note: It is not recommended to allow the network connection to reach the internet for security reasons. The CCU2EN should only be accessible from within the company's intranet.

### CHANGING THE IP ADDRESS

The IP address, subnet mask and gateway are most easily set using the Lantronix DeviceInstaller application available from the Lantronix website from this link: [http://ltxfaq.custhelp.com/app/answers/detail/a\\_id/644](http://ltxfaq.custhelp.com/app/answers/detail/a_id/644)

Alternatively, the network settings can be changed via Telnet on port 9999, however using the DeviceInstaller application is recommended.

Once the DeviceInstaller application is installed, power up the CCU2EN and connect it using a Cat-5 crossover cable using the same procedure as listed under the Network Configuration section above.

Start the DeviceInstaller application. The application will search for all devices on the same network. Once your device is found, it will show up on the list as an XPort Direct+. Double-Click on the folder which appears to expand the list. Click on the IP address of the unit and you should see the device details listed in the right panel. Click on the "Device" menu and choose "Assign IP Address..." (or press F7). From this dialog box, you can assign a static IP for the device or choose to change the device setup to DHCP.

Once the CCU2EN has the desired IP address, disconnect the device from the crossover cable. The CCU2EN can now be connected using a standard Cat-5 cable to your internal network switch.

To test the CCU2EN in the field with the new network settings, you can connect your computer to the same ethernet switch and set your computer's IP address to the same subnet as the settings for the CCU2EN.

Note: If the IP address is incorrect or you cannot view the CCU2EN website via the internal network, you must reconnect the CCU2EN with the crossover cable and try again. You will be unable to access the network device with its current IP, so when clicking "Assign IP Address..." as before, you will get a prompt for a hardware address for the device. The hardware address can be found inside CCU2EN printed on a label on the top of the Ethernet module. This should only be used as a last resort if the IP address was incorrectly set and is unable to be found on the network.

## System Operational Check

Power up system by plugging the CCU2EN quick disconnect together, remove controller from Ped recall and restore cabinet to normal operation.

Go to each EPBS and observe the following:

- That locate tone is sounding once per second during Don't Walk and Ped Clearance (takes up to 10-15 seconds following power up).
- That a call is placed at the controller, you hear button push confirmation sound (typically a verbal "wait") and the LED turns on when you push on the button.
- That when the Ped Walk comes up, you hear a walk sound/message.
- That during the Ped Clearance you hear the locate tone or a clearance sound. Note: If the countdown is chosen it must go through one complete cycle before you will hear the countdown during clearance.
- That the sound volume responds to ambient.

Watch the LEDs on the CCU2EN for the proper indication as described in the CCU2EN/Navigator Self-Check section on page 9. If the EPBS IDs have not yet been set, please do so at this time. Then press the SETUP button and look for the proper indication.

If everything appears to be working properly on each EPBS, install signs making sure arrow on sign points in same direction as button arrow. If sign has Braille there should be a label on the backside with the name of the street the arrow is pointing across (street being crossed). Note: Braille bumps of sign are on the side that faces out.

Refer to the companion Operation Manual as needed and perform the following:

1. Set an ID at each EPBS.
2. Press the SETUP Button.
3. Change the system Security Code (password).
4. Make any required configuration changes.

Once all push button stations are correctly configured, perform the Final System Operational Check on the next page. Sign off on this page that everything is operating correctly, then leave the sign off sheet (or the entire installation manual) in the traffic cabinet document file.



## Final System Operational Check

Inspector Name: \_\_\_\_\_ Date: \_\_\_\_\_

The person who performs this should sign off each test to the right of each test, sign below and keep copy in traffic cabinet.

Once all EPBSs are fully installed and configured, verify the following:

Performed  
and  
approved by

These tests will require two people, one at the controller, the other operating each EPBS.

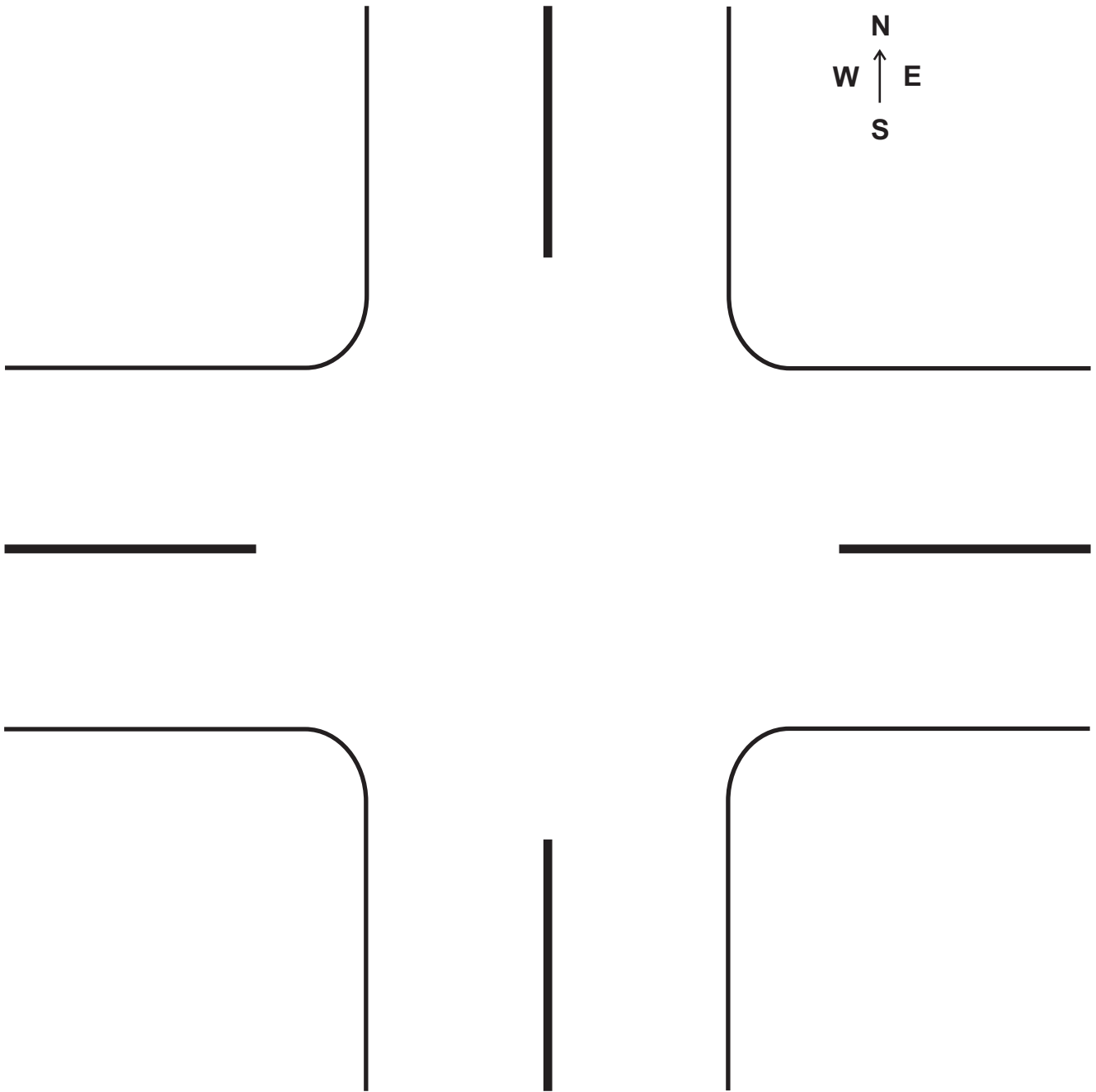
1. Confirm each EPBS plays the locate tone during the DON'T WALK mode and that its volume is set so it is typically heard no farther than 15 ft. from the EPBS. \_\_\_\_\_
2. Push each EPBS and verify that the red LED above the push button turns on with the first push, and that a sound is heard for each push. Verify that each press lights the appropriate PED Out indicator on the CCU2EN front panel and that the appropriate PED call is transmitted to the traffic signal controller on the correct phase. Ensure the walk cycle comes up, and based on the activation setting\*, the EPBS plays the proper walk message and the button vibrates. \_\_\_\_\_
3. Confirm the proper Clearance sound plays during the Clearance mode. \_\_\_\_\_
4. If any field wire pair measured greater than 1.5 Ohms, set the traffic controller to a mode that lets you observe, real time, each button push. During a Don't Walk phase, while someone is watching the controller, have another person push each button 10 times (every 2-3 seconds). Observe that the corresponding Ped Out LED is lit during the push. Make sure the controller registers all 10 pushes. Do this for every EPBS on the high resistance pair of wires. This is to ensure there are no marginal connections or unusual conditions that prevent the control unit from seeing every button push. \_\_\_\_\_
5. Perform communications test using EZ APS ToolBox Software (Polaris recommends using this test instead of the below E-Configurator test). \_\_\_\_\_

Alternately, at each EPBS, establish communication with the E-Configurator, verify the proper ID is set, and get to the point following read setting for Push Button Station (it should read "LOCATE TONE MIN"). Push the Central Control Unit Read Settings button. You should see the two LEDs on the E-Configurator flash for 3-4 seconds and the screen should read "INPUT #1 FUNCTION NONE". If this is what you get, push the Push Button Station Read Settings again. The two LEDs should flash for approximately 2 seconds and "LOCATE VOL MIN" should show on screen. Do this two to three more times making sure the proper screen text appears each time. What this is doing is verifying that the communication from the Push Button Station to the CCU2EN is good (wire in ground is good) and no data is being lost. \_\_\_\_\_

**Performing this test on each EPBS is very important to be confident of proper operation of the system.** Resistance of >1.5 ohms between an EPBS and the traffic cabinet, or the presence of electrical interference, may cause data transmission problems.

6. Confirm volumes are adequately set and respond to ambient noise. If each EPBS performs all of the above correctly, the system is operating correctly. \_\_\_\_\_
7. Disconnect the power cord from the CCU2EN. Within a few seconds the fail-safe feature should lock in a call on all phases. Reconnect power cord and the locked calls should clear within one minute. Ensure locked calls clear and the self check feature operates correctly. \_\_\_\_\_
8. Disconnect field wire for one button (or one crosswalk) at the Interconnect Board. Within 1 minute a call should lock in on the traffic controller for that phase. Reconnect field wire and locked call should clear within 1 minute. \_\_\_\_\_
9. Following a self test, which occurs every 30 seconds, verify that the status LEDs correspond to the installed EPBSs. Also, verify Power, Walk & Don't Walk LEDs are on as expected. \_\_\_\_\_

\*Confirm if the walk message is set to come on with any push or only an extended push and push the button accordingly. \_\_\_\_\_



Date Installed: \_\_\_\_\_

Installed By: \_\_\_\_\_

Company: \_\_\_\_\_

Personnel: \_\_\_\_\_

Special Notes: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## CCU2EN CABLE/CONNECTOR WIRING DETAIL

#1 7 CONDUCTOR CABLE			CONNECTOR PIN NUMBERS
COM	BLK	46	Disconnect button field wires in cabinet from where they normally connect to and connect field wires to Interconnect Board according to phasing.
A	BRN	15	
B	RED	31	
C	ORA	14	
D	YEL	30	
COM	GRN	47	Used for options only
+22	BLU	13	Used for options only

#2 5 CONDUCTOR CABLE		
PED COM	WHT/BLK	34
PED A	WHT/BRN	18
PED B	WHT/RED	19
PED C	WHT/ORA	1
PED D	WHT/YEL	2

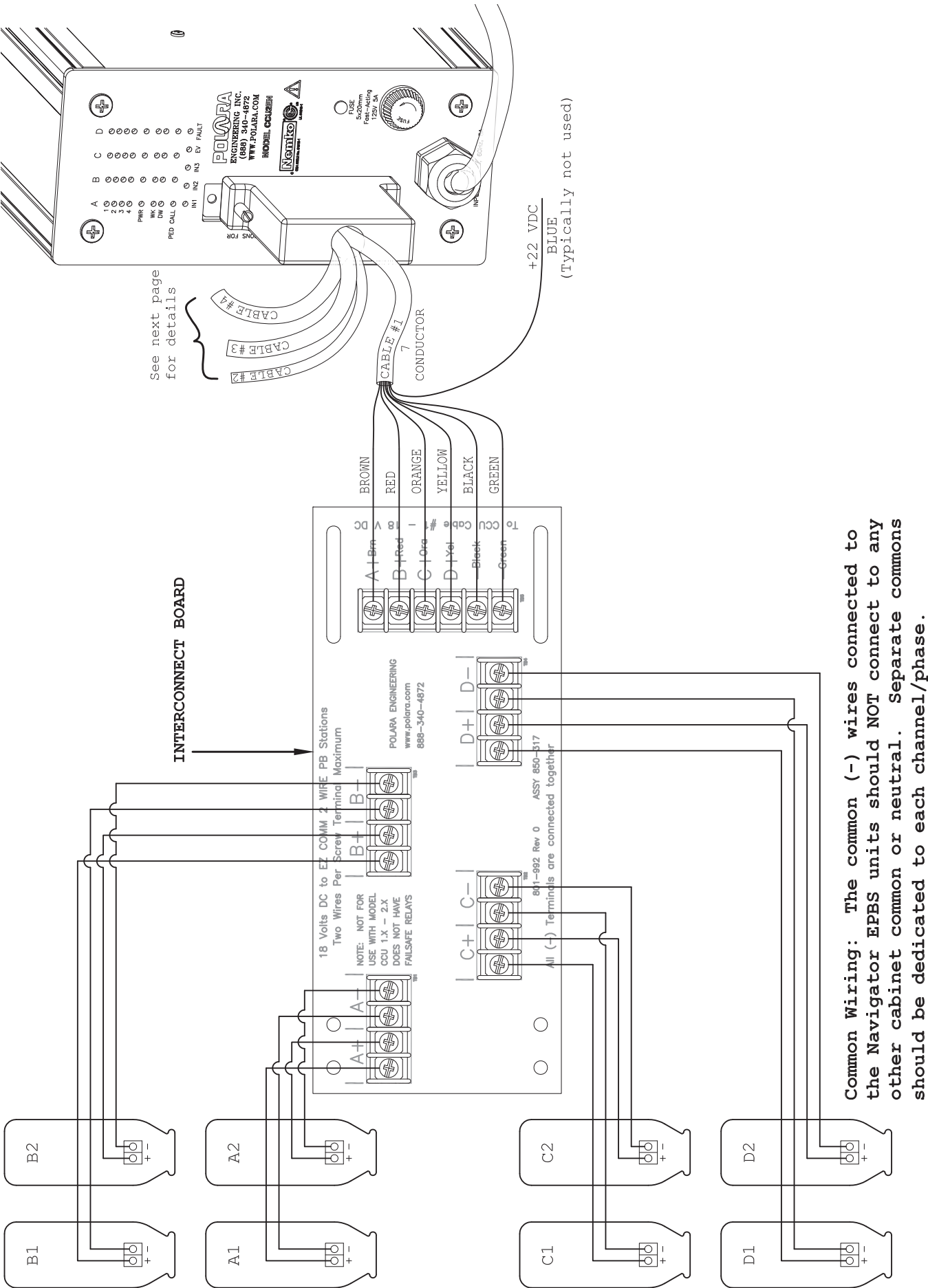
Connect to terminals where button field wires used to connect.

#3 12 CONDUCTOR CABLE		
USED ONLY FOR OPTIONAL SPECIAL FUNCTIONS		
GP IN COM	BLK	23
GP IN 1	BRN	4
GP IN 2	RED	39
GP IN 3	ORA	21
EV1	YEL	5
EV2	GRN	38
EV3	BLU	22
EV4	VIO	37
EV COM	GRY	6
FAULT COM	WHT	35
FAULT NO	WHT/BLK	20
NOT USED	WHT/BRN	

#4 10 CONDUCTOR CABLE		
W/DW COM	WHT	11
A W	BRN	25
A DW	RED	43
B W	ORA	42
B DW	YEL	8
C W	BLK	26
C DW	BLU	9
D W	VIO	27
D DW	GRY	10
NOT USED	GRN	12

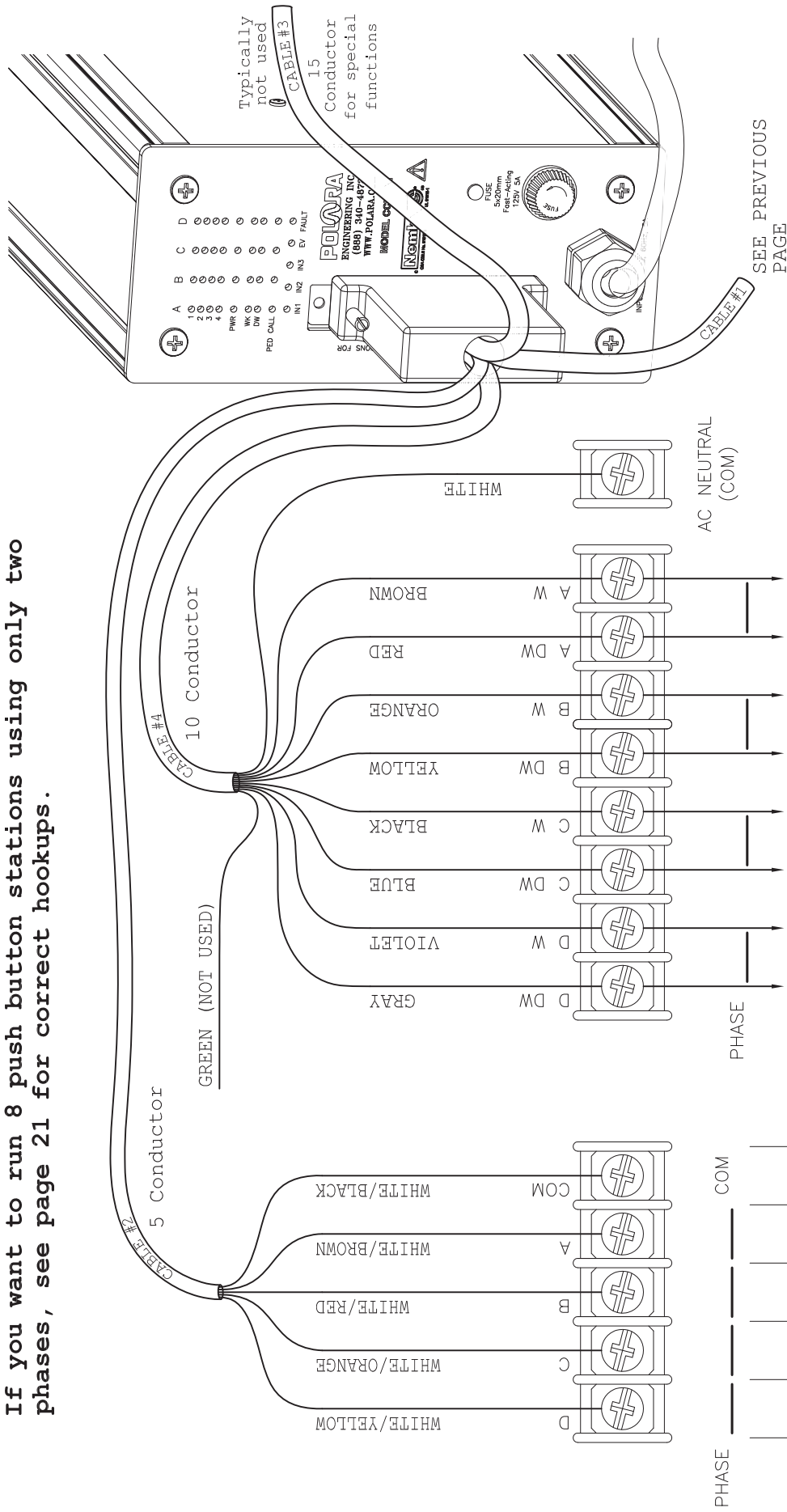
Connect to 115VAC feeds to ped heads according to phasing.

CCU2EN and Interconnect Board Cabinet Wiring



CCU2EN and Interconnect Board Cabinet Wiring (Cont.)

If you want to run 8 push button stations using only two phases, see page 21 for correct hookups.



NOTE: Terminal location numbers may be different on older cabinets. Verify your correct phasings and landings.

TYPICAL PHASING	PED BUTTON INPUTS				LOAD BAY OUTPUT FILE				TB01
	Ø8P	Ø6P	Ø4P	Ø2P	Ø8P	Ø6P	Ø4P	Ø2P	
TYPICAL 332 CABINET	8	7	5	4	110	112	119	121	10
	TIE AC COMMONS TOGETHER				EXISTING WIRING TO PED HEAD LIGHTS (115 VAC)				

## Wire Routing Diagram

Ensure a minimum of 8" of wire extends from the pole.

Tape wires parallel starting 1.5" from ends up to and past the wire hole.

Strip end of wires to wrap around screw terminals.

Make sure wires are within the guide channel of the casting and not pinched between the pole and casting.



Wires connected to terminal block.



Make sure wires going into hole in pole are taped and protected against shorting on sharp edges of hole.



## Default and Field Settings

City \_\_\_\_\_ State/Province \_\_\_\_\_ Install Date \_\_\_\_\_

Intersection: \_\_\_\_\_

Street: \_\_\_\_\_

Corner: \_\_\_\_\_

ID: \_\_\_\_\_

Phase: \_\_\_\_\_

### Defaults

LOCATE VOL MIN	0%	_____	_____	_____	_____	_____	_____	_____
LOCATE VOL MAX	50%	_____	_____	_____	_____	_____	_____	_____
INFO MSG VOL MIN	65%	_____	_____	_____	_____	_____	_____	_____
STD WALK VOL MIN	30%	_____	_____	_____	_____	_____	_____	_____
STD WALK VOL MAX	60%	_____	_____	_____	_____	_____	_____	_____
EXT WALK VOL MIN	60%	_____	_____	_____	_____	_____	_____	_____
EXT WALK VOL MAX	80%	_____	_____	_____	_____	_____	_____	_____
VOL OVER AMBIENT	0 dB	_____	_____	_____	_____	_____	_____	_____
LOC VOL OVER AMBIENT	0 dB	_____	_____	_____	_____	_____	_____	_____
WALK MODE SOUND	STD MSG	_____	_____	_____	_____	_____	_____	_____
WALK SOUND PAUSE	.5 SEC	_____	_____	_____	_____	_____	_____	_____
WALK SOUND TRIG	ANY PUSH	_____	_____	_____	_____	_____	_____	_____
SOUND/VIB TIMER	20 SEC	_____	_____	_____	_____	_____	_____	_____
SOUND/VIB RETRIG	NEW WALK	_____	_____	_____	_____	_____	_____	_____
CANCEL ON CLEARANCE	YES	_____	_____	_____	_____	_____	_____	_____
CLEAR MODE SOUND	TONE 1	_____	_____	_____	_____	_____	_____	_____
CLEAR TONE PAUSE	1 SEC	_____	_____	_____	_____	_____	_____	_____
LOCATE SOUND	TONE 1	_____	_____	_____	_____	_____	_____	_____
LOCATE TONE TIME	1 SEC	_____	_____	_____	_____	_____	_____	_____
WAIT MESSAGE	NO	_____	_____	_____	_____	_____	_____	_____
DIRECTION MSG	NORTH	_____	_____	_____	_____	_____	_____	_____
INFO MESSAGE	NONE	_____	_____	_____	_____	_____	_____	_____
PUSH CONFIRM MESSAGE	STD	_____	_____	_____	_____	_____	_____	_____
CANCEL ON WALK	YES	_____	_____	_____	_____	_____	_____	_____
EXT PUSH TIME	1.0 SEC	_____	_____	_____	_____	_____	_____	_____
SECOND LANGUAGE	NO	_____	_____	_____	_____	_____	_____	_____
THIRD LANGUAGE	NO	_____	_____	_____	_____	_____	_____	_____
EXT PUSH PRIORITY	NO	_____	_____	_____	_____	_____	_____	_____
WALK PING PONG	OFF	_____	_____	_____	_____	_____	_____	_____
CLEAR PING PONG	OFF	_____	_____	_____	_____	_____	_____	_____

Special Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Default and Field Settings (page 2 for islands)

	ID:							
	Phase:							
	<u>Defaults</u>							
LOCATE VOL MIN	0%							
LOCATE VOL MAX	50%							
INFO MSG VOL MIN	65%							
STD WALK VOL MIN	30%							
STD WALK VOL MAX	60%							
EXT WALK VOL MIN	60%							
EXT WALK VOL MAX	80%							
VOL OVER AMBIENT	0 dB							
LOC VOL OVER AMBIENT	0 dB							
WALK MODE SOUND	STD MSG							
WALK SOUND PAUSE	.5 SEC							
WALK SOUND TRIG	ANY PUSH							
SOUND/VIB TIMER	20 SEC							
SOUND/VIB RETRIG	NEW WALK							
CANCEL ON CLEARANCE	YES							
CLEAR MODE SOUND	STONE 1							
CLEAR TONE PAUSE	1 SEC							
LOCATE SOUND	STONE 1							
LOCATE TONE TIME	1 SEC							
WAIT MSG	NO							
DIRECTION MSG	NORTH							
PUSH CONFIRM MESSAGE	NONE							
INFO MESSAGE	STD							
CANCEL ON WALK	YES							
EXT PUSH TIME	1.0 SEC							
SECOND LANGUAGE	NO							
THIRD LANGUAGE	NO							
EXT PUSH PRIORITY	NO							
WALK PING PONG	OFF							
CLEAR PING PONG	OFF							

Special Notes: \_\_\_\_\_

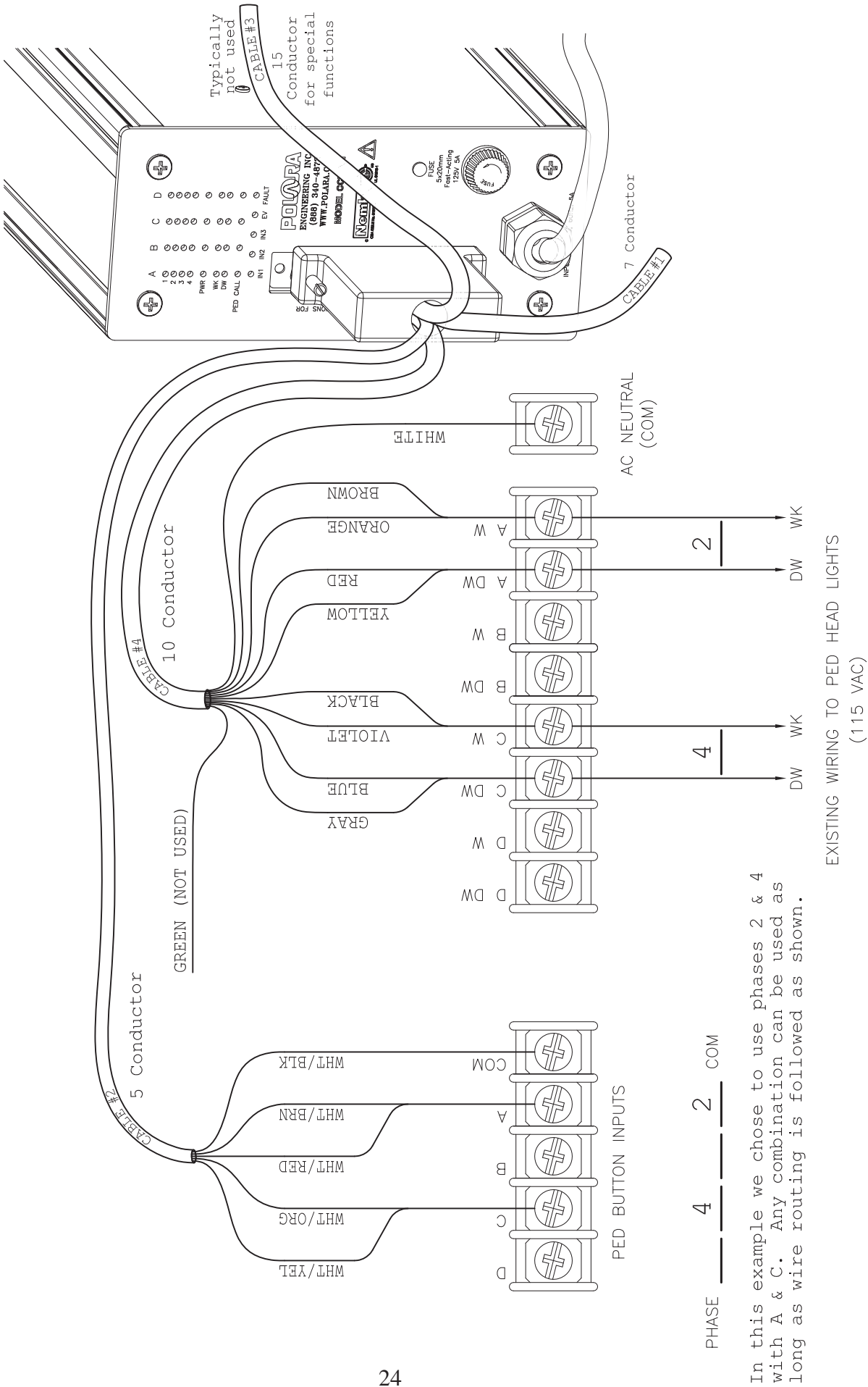
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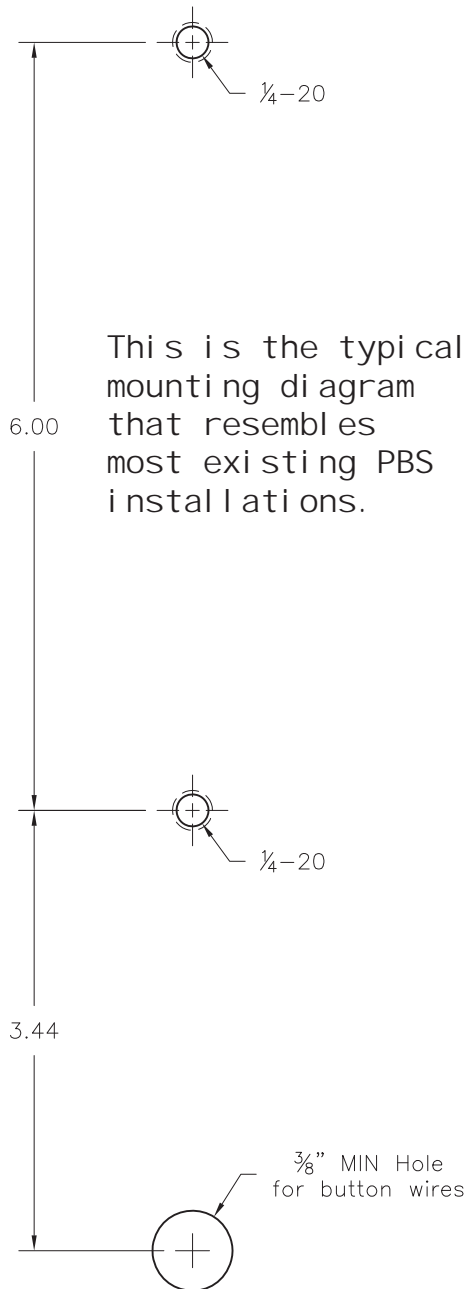
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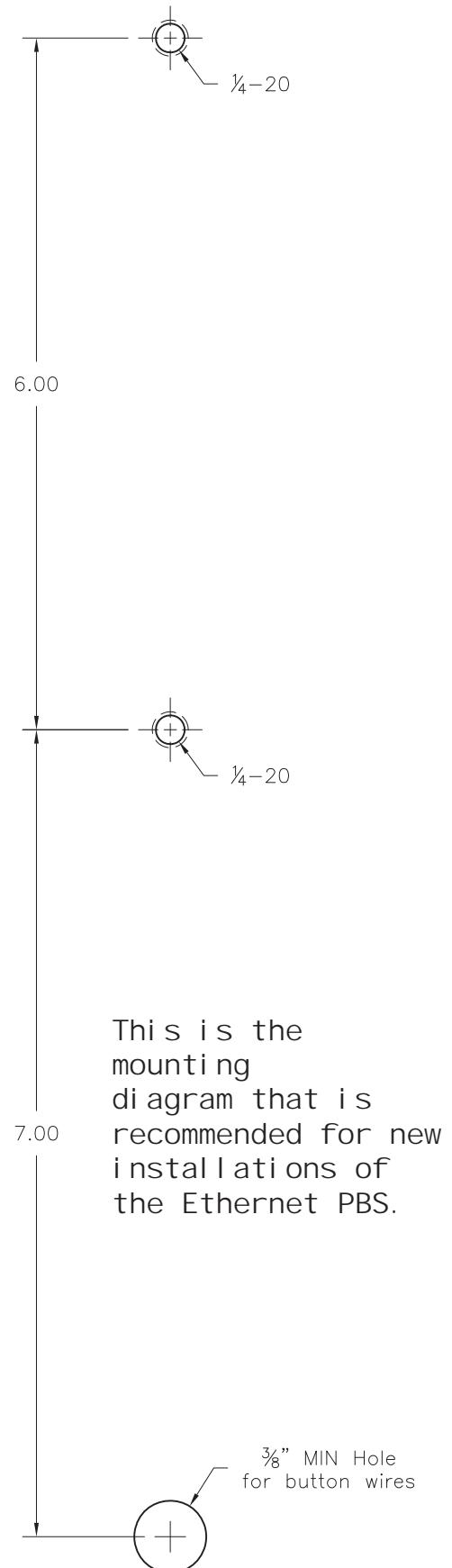
# EXAMPLE FOR CCU2EN CABINET WIRING USING FOUR CHANNELS ON TWO PHASES



## MOUNTING HOLE DIAGRAM FOR PUSH BUTTON STATIONS



This diagram is not actual size. Recreate the dimensions shown on the pole and mark the proper positions.



# 2-WIRE EZ COMMUNICATOR SYSTEM WIRING WITH OPTIONAL EMERGENCY MESSAGE AND GP INPUTS

EN2 Push Button Stations

