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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 888-340-4872. 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 (can be found in the Support section at www.polara.com). Firmware update video tutorials are also available in the Installation section at www.polara.com.

EZ APS Toolbox

Polara offers the EZ APS Toolbox 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 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. 1.5 ohms is only for reference. Many other factors can apply and are discussed in more detail in this manual.

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 Toolbox 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 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 Toolbox 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 ToolBox 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 Toolbox 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 11** of this manual.

Software Information

Polara EZ APS Toolbox 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 11** 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.

Video Tutorials

Tutorial videos showing many of the procedures presented in this manual can be found in the Installation section at www.polara.com. Videos include operation demonstrations of the E-Configurator, EZ APS ToolBox, EPBS Audio Programming, and more.

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 23.

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.

Special Notes

The 1.5 ohm resistance per pair of button wires is only a general reference guide for the use of 2 Push Buttons Stations on a channel. The approximate maximum run for 2 buttons is 300' to 400' from the cabinet, but this depends on wire size, quality, and existence of splices. If 3 or 4 Push Button Stations are put on a channel, this resistance value limit no longer applies. A system can support up to 4 buttons per channel, but the wire conditions must be optimal. Long wire runs, splices, etc. add variables that can cause a system with 3 to 4 buttons on a channel to not work properly. It is best to put just 2 Push Button Stations per channel whenever possible.

On intersections where the wire run is greater than 300' and there are communications issues; pulling larger size wire, or the addition of a second CCU2EN operating the button with the farthest distance from the cabinet, may address these issues.

E-Navigator Push Button Stations are not designed to be mounted upside down. The gasketing is designed to seal moisture out from the top down. If a Push Button Station is mounted upside down, it will likely fill with water and void the warranty.

Black cased Configurators will only work with black colored CCUs. Grey cased Configurators will work with both black and blue colored CCUs. For instructions on how to use the Configurator, download the **"E-Configurator Manual"** at www.polara.com or watch the corresponding video tutorials in the Installation section.

For instructions on how to record and prepare Custom Voice Messages, or use the EZ APS ToolBox, download the **"Preparing Custom Voice Messages"** instruction sheet at polara.com or watch the corresponding video tutorials in the Installation section.

For instructions on how to set up a network configuration for monitoring an intersection from a Central Traffic Control Center, download the **"Advanced Network Configuration"** instruction sheet at www.polara.com.

If using Preemption message, and message plays continuously, Polara's Preemption Adapter (P/N: 850-275) is required because voltages between systems do not match.

To meet new Push Button location requirements, Polara offers products for extending buttons from poles, and adaptor products for mounting two buttons on one pole. Ask your Distributor or see the Mounting Accessories section at www.polara.com.

Summary of Installation Steps

(read pages 6-9 for details on each step)

STEP 1

Plan EPBS locations (if special messages).

Verify arrow directions are correct.

Set IDs for each crossing/phase.
(temporary shop hook-up)

STEP 2

Place intersection in PED Recall.

Determine CCU2EN location in cabinet. Install.

Determine Interconnect Board location. Install.

STEP 3

Attach 50 pin connector/cable assembly to CCU2EN.

Route cables to hook-up locations.

Connect wires per pages 16-18.

STEP 4

Disconnect CCU2EN power cord from CCU2EN.

Connect stripped power cord end to 115 VAC source.

DO NOT POWER UP CCU2EN YET.

STEP 5

Remove existing push buttons (if present) and verify 8" of wire available (pg. 19).

Ohm out each pair of button wires between button and cabinet to ensure less than 1.5 ohms.

Determine proper orientation for each EPBS.
Drill and tap any necessary holes.
(template on page 23)

STEP 6

Remove signs from EPBS(s).

Bolt EPBS on pole.

Connect button wires to EPBS (see page 19).

Install bottom cover.

Install sign.

STEP 7

Power up system. Change Security Code (password).

Make sure each EPBS has its unique ID set, then push setup button on CCU2EN.

Set preferences with E-Configurator or EZ APS ToolBox.

Perform System Operational Check (pg. 13).

Complete Final System Operational Check Sign-off Sheet (pg. 14).

*** Black Case Configurators are not compatible with EPBS systems. <u>Grey Case</u> EConfigurators must be used.**

Installation 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. An intersection diagram worksheet is provided on page 15. 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 E-Configurator Manual). This way, only volume adjustments should be needed in the field. Tag/Mark each unit with it's 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"** instruction sheet found under the Support section at www.polara.com. 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 **"Network Configuration" on page 11.**

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 **"Preparing Custom Voice Messages"** instruction sheet found under the Support section at www.polara.com.

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 16-18 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 (especially if 3 or 4 buttons are on a 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. 18).

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

In an application where the wiring must be run externally on the pole (i.e. wood pole mount), the small lower cover may be drilled and tapped for a ½" threaded pipe allowing conduit to be run to the bottom of the unit.

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 25 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 19 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, see "**Preparing Custom Voice Messages**" instruction sheet found under the Support section at www.polara.com. 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 www.polara.com. You can also contact Polara for more information at 888-340-4872.

Each EPBS must have its own unique ID. This is accomplished using an E-Configurator or the EZ APS ToolBox software via PC connected to the EPBS. If you are not familiar with how to use an E-Configurator, read the E-Configurator Manual shipped with each E-Configurator, or download a copy from the Support section at www.polara.com. Using an E-Configurator, establish communication with the button. After the password is entered the versions will display, then the connected channel letter will display. If the ID was previously set you will see a letter and number between 1 and 4. If this does not need to be changed, simply

press the Down Arrow Key. If the ID has not been previously set you will see “None-Must Be Set”. To set/change an ID use the right/left (<Yes/No>) arrow keys to select a number between 1 and 4, then push the Down Arrow Key to enter your selection.

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

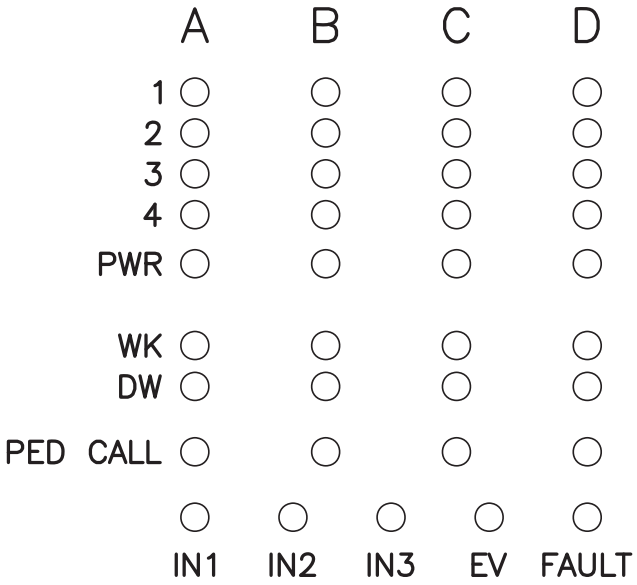
The EZCommunicator Central Control Unit can be used with older 2-Wire Navigator PBSs (N2). Preferably, the Navigator version should be 1.12 or later. Likewise, EN2 Navigator EPBSs may be used with older CCUs.

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



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.

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:

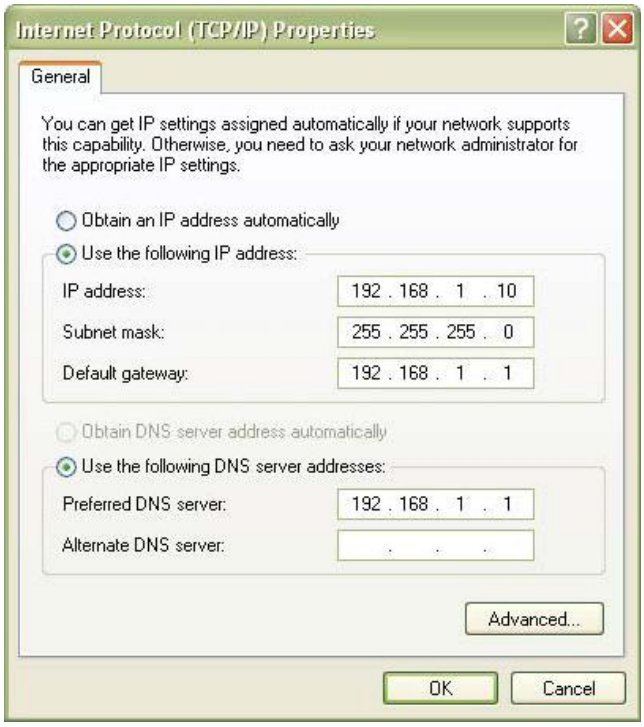
IP address: 192.168.1.10

Subnet Mask: 255.255.255.0

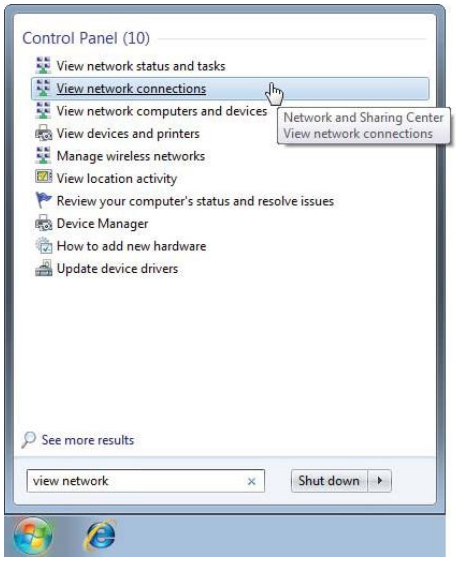
Default Gateway: 192.168.1.1

Preferred DNS server: 192.168.1.1

Click OK on both windows.



Windows Vista or Windows 7:



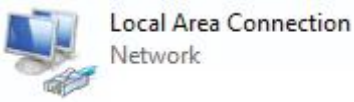
Click on the Start Menu Icon.

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".

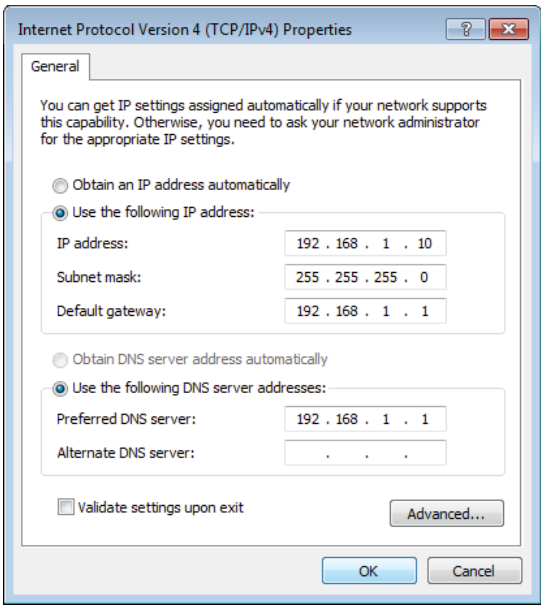
Right click on "Local Area Connection" and choose Properties.



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/

System Operational Check

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

Watch the LEDs on the CCU2EN for the proper indication as described in the **"CCU2EN/Navigator Self Check Feature" 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.

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 the correct 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.

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 page 14. 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.

Performed and approved by

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

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 (Polara 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.

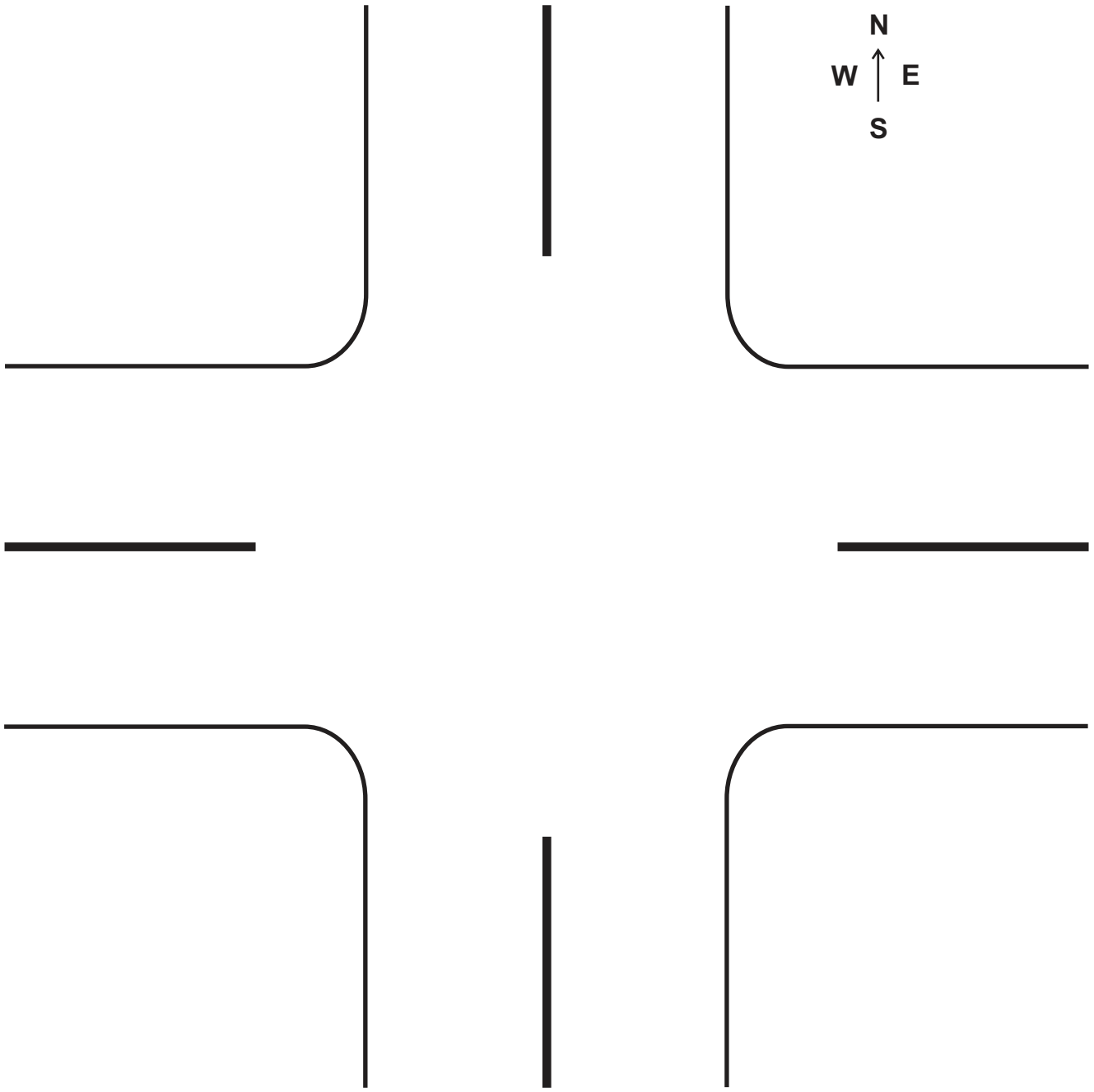
6. Confirm volumes are adequately set and respond to ambient noise. If each EPBS performs all of the above correctly, the system is operating correctly.

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: _____

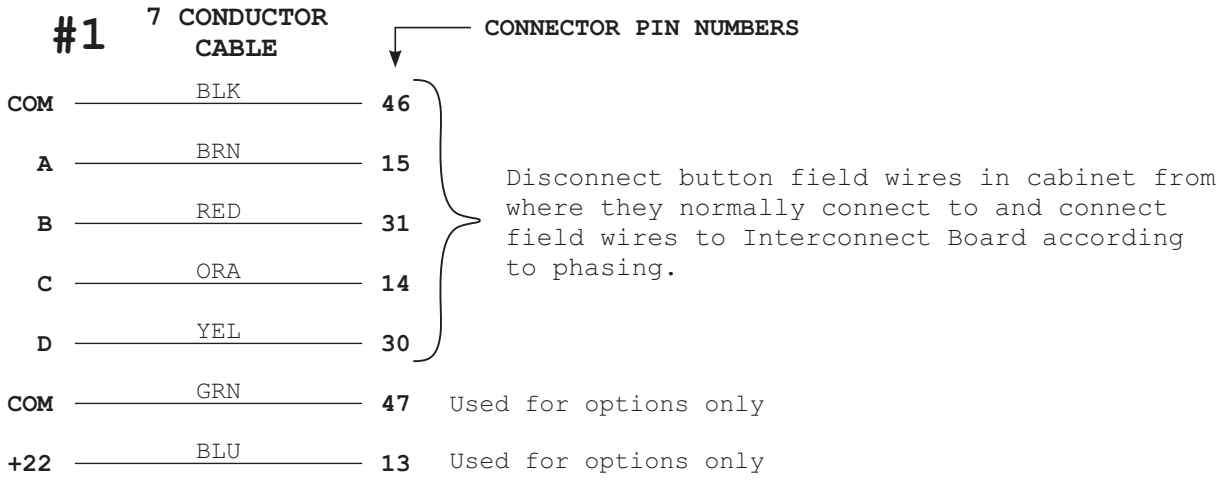
_____

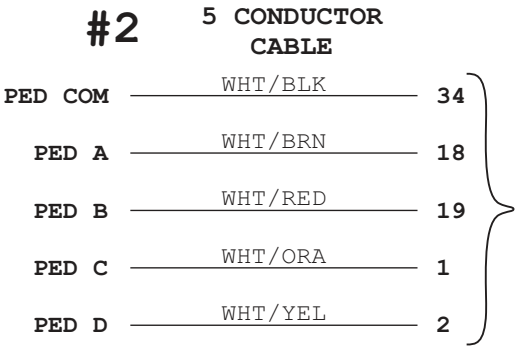
_____

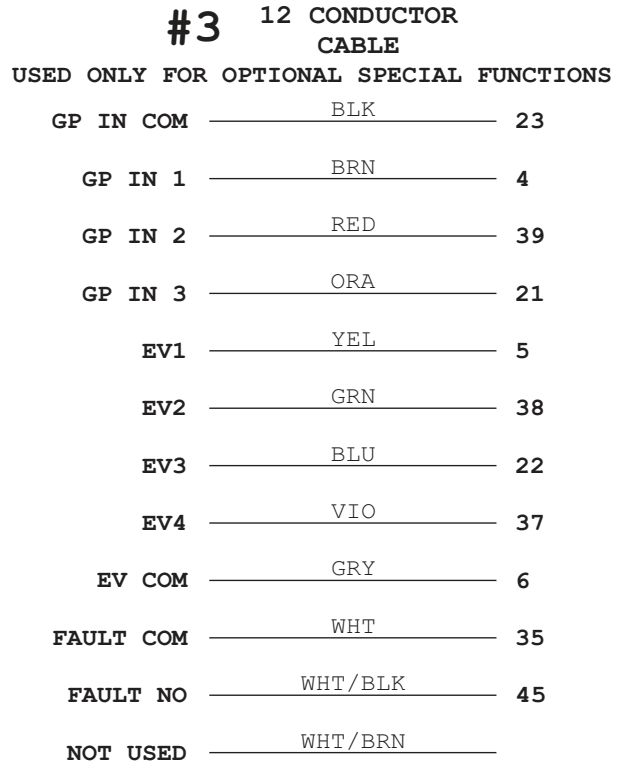
_____

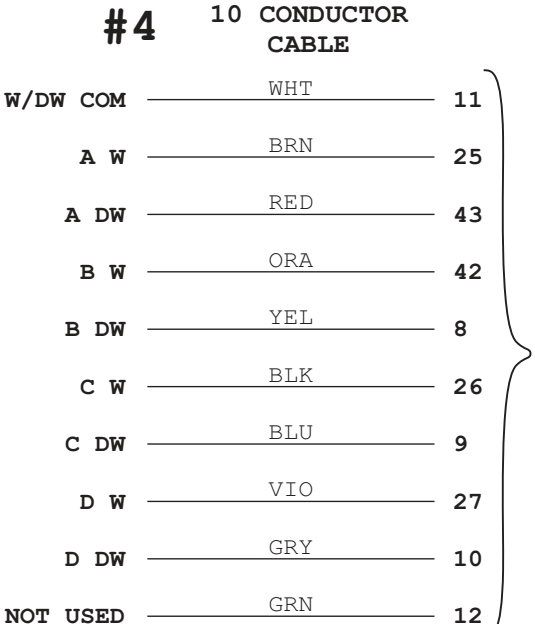
_____

CCU2EN CABLE/CONNECTOR WIRING DETAIL

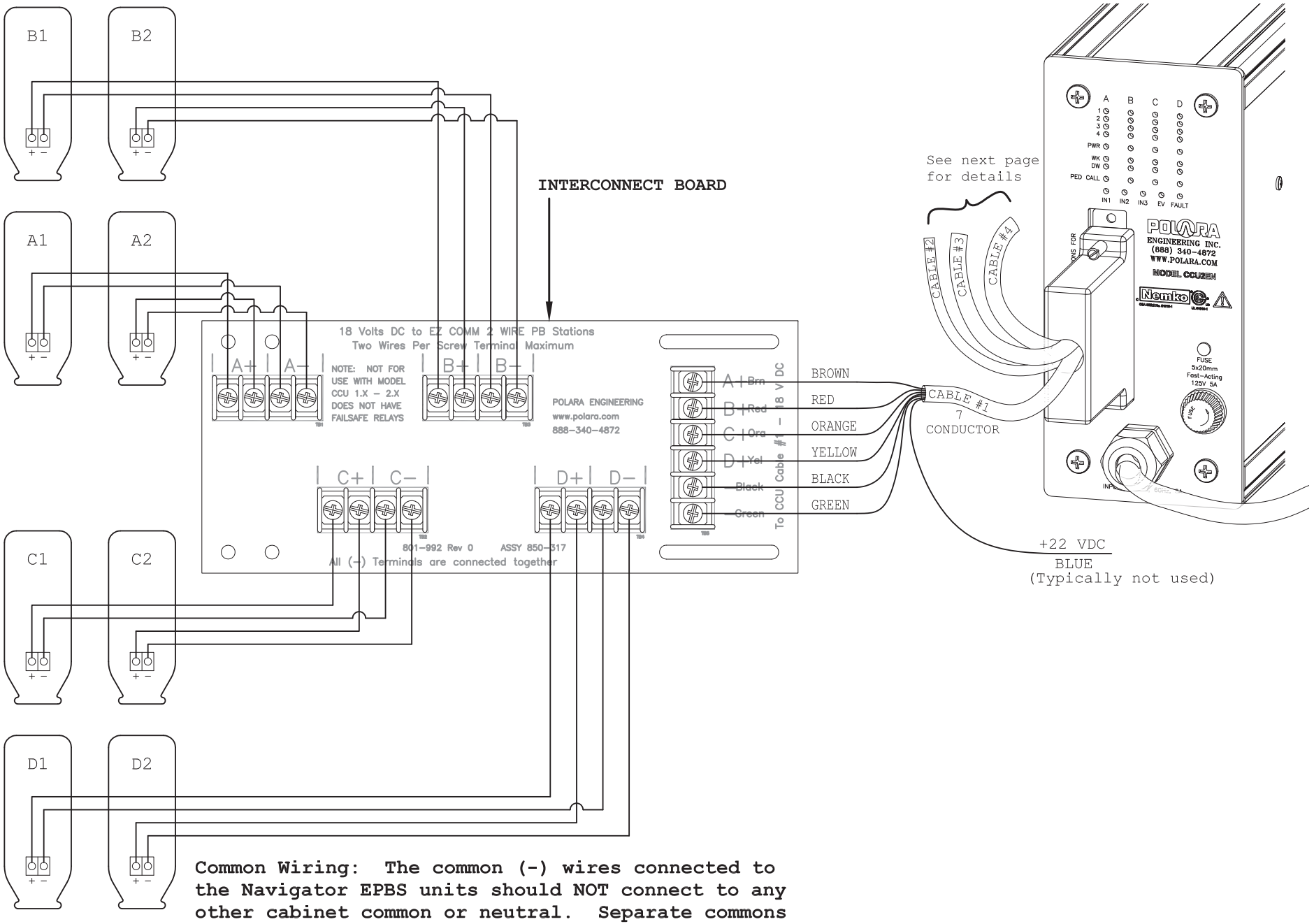








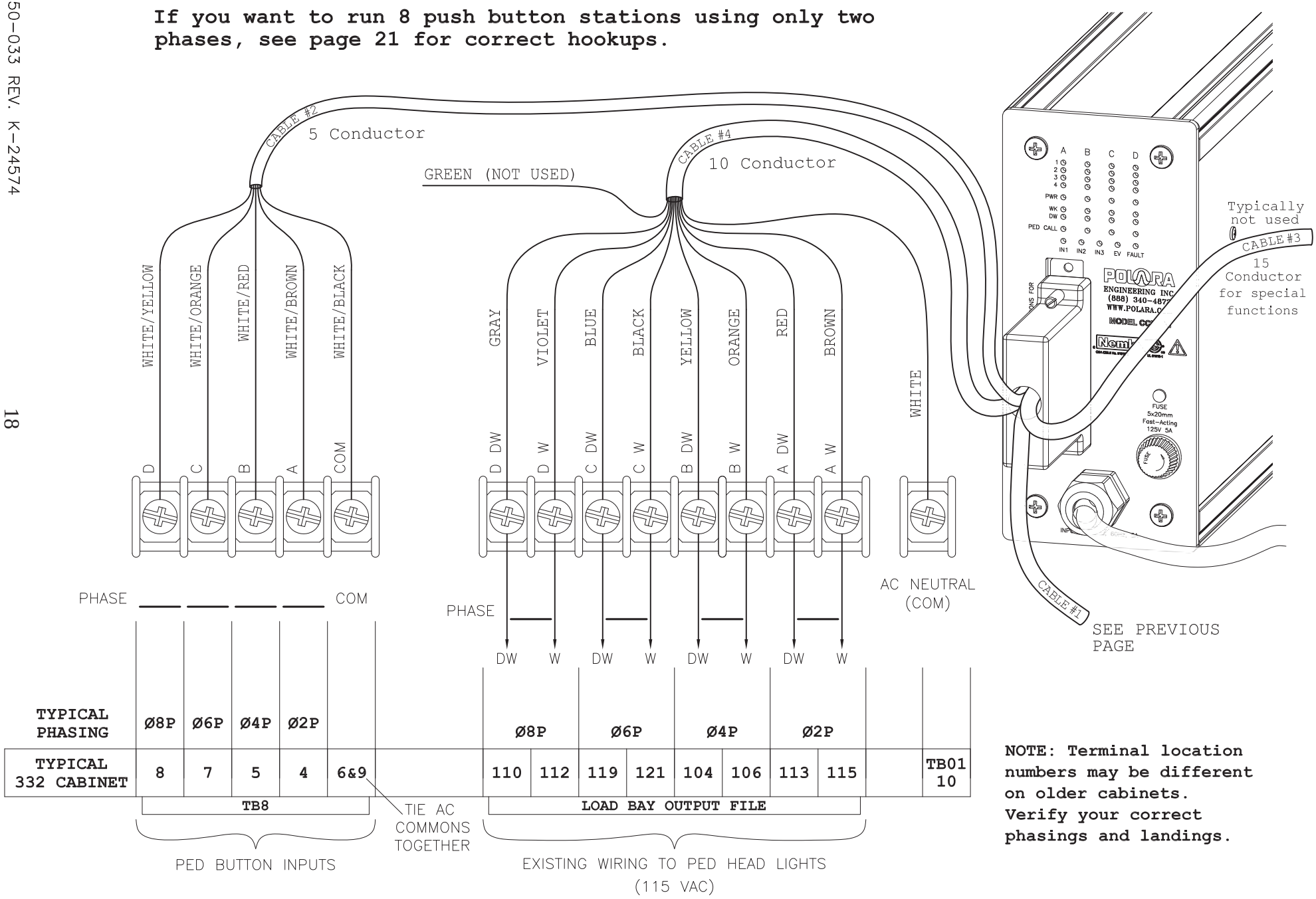
CCU2EN and Interconnect Board Cabinet Wiring



Common Wiring: The common (-) wires connected to the Navigator EPBS units should NOT connect to any other cabinet common or neutral. Separate commons should be dedicated to each channel/phase.

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.

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.

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

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	WAIT								
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:								
	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 MSG	NO								
DIRECTION MSG	NORTH								
INFO MESSAGE	NONE								
PUSH CONFIRM MESSAGE	WAIT								
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								

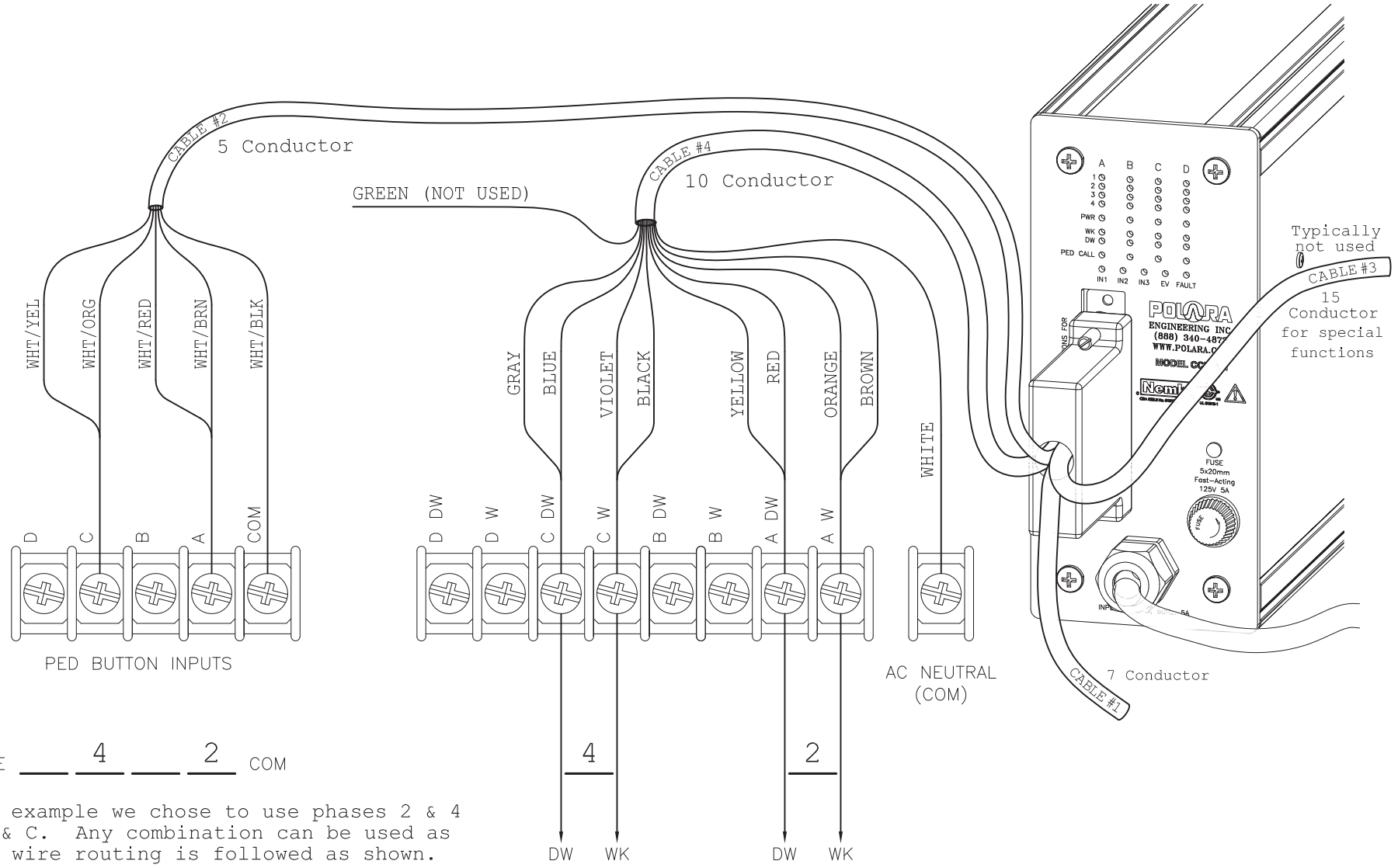
Special Notes: _____

_____

_____

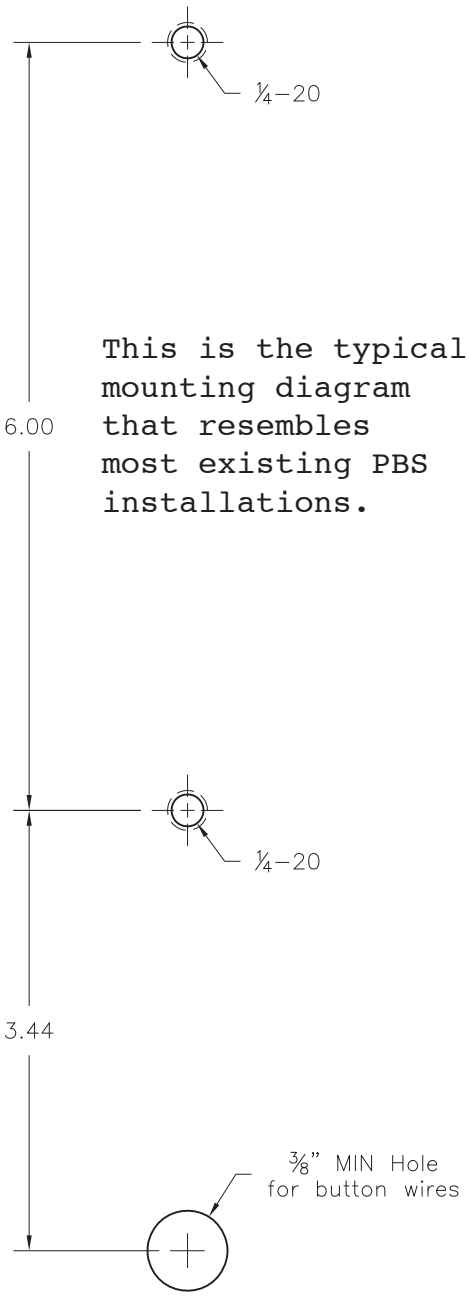
_____

EXAMPLE FOR CCU2EN CABINET WIRING USING FOUR CHANNELS ON TWO PHASES

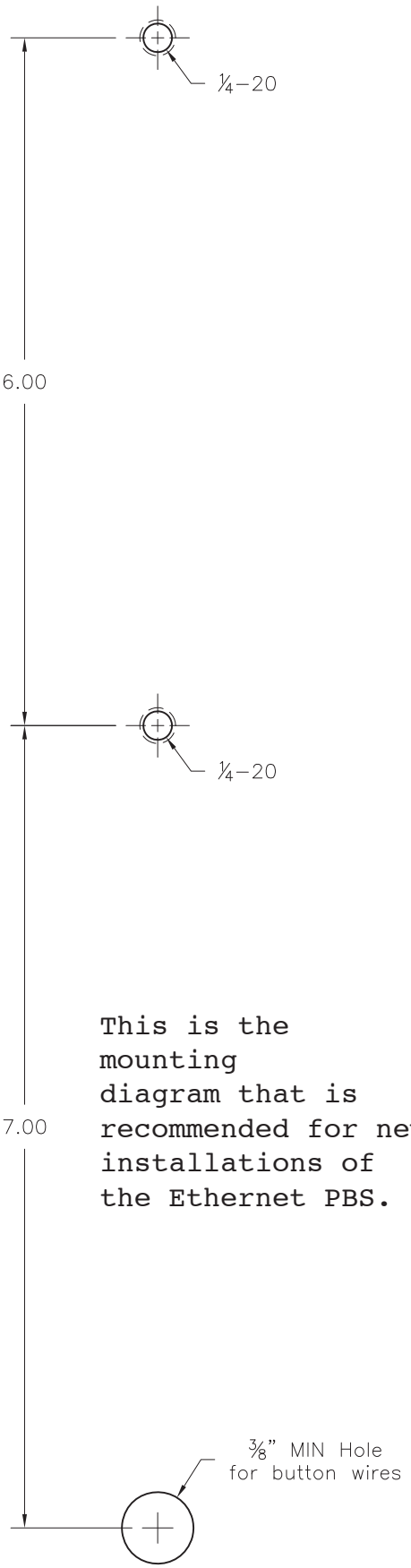


In this example we chose to use phases 2 & 4 with A & C. Any combination can be used as long as wire routing is followed as shown.

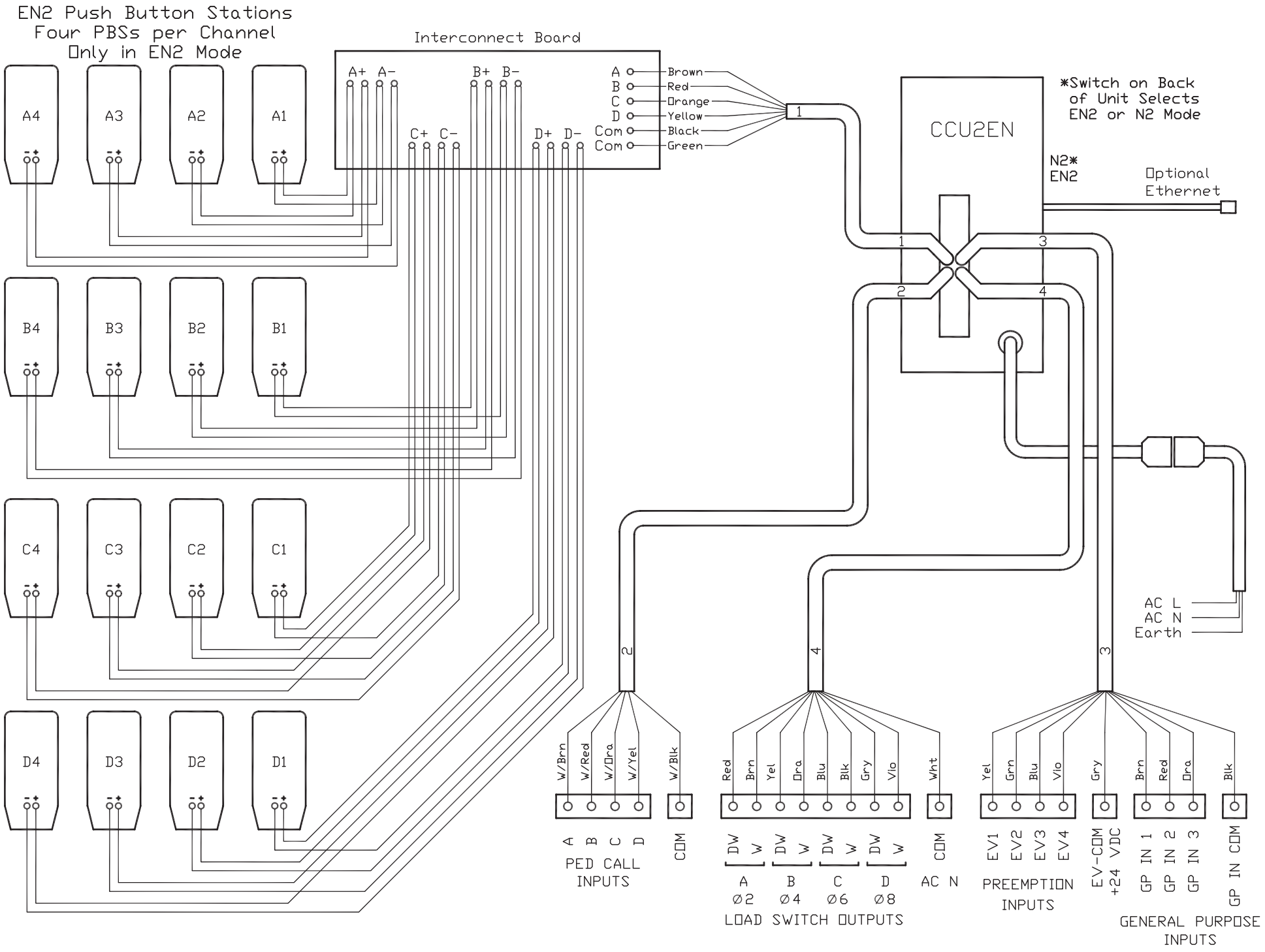
MOUNTING HOLE DIAGRAM FOR PUSH BUTTON STATIONS



This is the typical mounting diagram that resembles most existing PBS installations.



This is the mounting diagram that is recommended for new installations of the Ethernet PBS.

These diagrams are 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