

EZCommunicator 2 Wire Navigator APS System

Operation Manual

This Manual

A copy of this manual and the companion Installation 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 section "How to Update Firmware in the E-Navigator System" on page 15 of this manual. 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 to 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 Installation Manual for the complete installation procedure for the EZ Communicator 2 Wire Navigator system.

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 "Backward Compatibility" section in the Installation 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 changed to NONE.

See the E-Configurator Manual for more information. It can be downloaded from the Support section at www.polara.com

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 the "**CCU2EN/Navigator Self Check Feature**" section in the Installation 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 "**Health Log Fault/Event Descriptions**" on page 16 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. See the "**Network Configuration**" section in the Installation Manual for complete instructions on installation and operation.

Default Ethernet Address for Status Page:

<http://192.168.1.223/>

E-Configurator

The E-Configurator is a battery operated hand-held device for making changes to the operating characteristics of Polara Navigator and EZ Communicator Push Button Stations (EPBSs). It uses two-way infrared communication while held in front of a EPBS and pointed toward the red LED above the EPBS arrow button. The older model Configurator has a black case while the new E-Configurator has a gray case. The E-Configurator is backward compatible with older Navigator units, **but older Configurators are not compatible with EZ Communicator systems operating in EN2 mode.** The E-Configurator Manual can be downloaded from the Support section at www.polara.com. Also see the E-Configurator tutorial video which is available in the Installation section at www.polara.com.

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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Overview

Polara's "EZCommunicator 2 Wire Navigator" Accessible Pedestrian Signal (APS) System provides vibro-tactile and audible information to all pedestrians. A system consists of a set of push button stations (EPBS) connected to a central control unit (CCU2EN). These connections typically use existing push button wiring from the traffic signal controller cabinet to the push button locations, with no additional field wiring required. The EZCommunicator 2 Wire Navigator APS is an updated version of our original 2 Wire Navigator with several significant improvements. These improvements include:

1. Ethernet connectivity for remote access
2. Audio file updating via USB
3. Firmware updating via USB
4. Higher quality, pure digital audio
5. Support for 16 push button stations (4 channels with 4 EPBS per channel) with one CCU2EN (ideal wire conditions required, see Installation Manual)
6. Save up to four user customized configurations in the E-Configurator

Polara's "2 Wire Navigator System" is a coordinated system that significantly reduces the amount of labor required to install and program an APS system on an intersection, and it is extremely easy to customize the system to meet the needs of complex intersections. In addition, it synchronizes all of the sounds on the intersection and can be setup to allow the user to mute the sounds on all other crosswalks except for the one they are using.

The system comes from the factory pre-configured with standard performance options suitable for most intersections. However, should you have a special performance need, the system has a large number of options to cover virtually all special requirements.

If there is not a separate common for each channel, a single common dedicated to all PBS units may be adequate. The PED common may not be the same wire(s) that are used for AC Neutral supplying lights in the intersection.

Polara cannot guarantee a 2 wire system will work properly in all instances, especially if a single common to the buttons and signal lighting is shared. Each case will have to be tried and proven because it depends on the condition of the wires, splices, etc... In the event the 2 Wire system does not work, Polara will swap it out for a 4 Wire system as long as there is no damage to the units.

Please carefully read the contents of this manual in its entirety so you fully understand the many functions and options the system provides. For a successful installation you must thoroughly read the Installation Manual. For correct setup of features you must be very familiar with this Operations Manual.

The EZCommunicator Push Button Stations (EPBS) and CCU2EN are backward compatible with earlier N2 Navigator Systems. However, any combination of old with new will only have the features of the older system and the N2 installation and operating manuals apply. Only when you have a CCU2EN with all EPBS will you be able to take advantage of all the EZCommunicator System's extra features.

The CCU2EN has a compatibility MODE switch on the rear panel. Position N2 must be used whenever one or more older PBSS 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 PBSS recognize the difference in voltage and operate in N2 mode whenever the voltage is 22 volts DC. In N2 mode, the operation is identical to older PBSS. If all are EPBSs, then use the EN2 switch position.

Standard Features

Two Wire Advantage

- Uses existing push button wiring, only two wires; very easy to hook up.
- Significantly reduced installation cost due to no additional wires required.
- Synchronizes sounds on an intersection.
- Allows use of Ping Pong, Muting, Update All, and other features.

System Features

- Has independent minimum & maximum volume settings for pre-walk information message, Locate Sounds, Clearance & Walk Sounds, for both standard and extended push operating conditions.
- Allows for global configuration changes (setup one and save changes to all vs. setup per individual push button station).
- Optional clearance sounds or audible countdown of remaining seconds during clearance available; complements or replaces visible countdown displays.
- Secure configuration (password protection) prevents unauthorized changes.
- Button rated for 20 million+ operations with < 3 lb. actuation force.
- Multiple language option available; user selectable by length of button push.
- Maximum volume dynamic range 60 dB.
- Optional announcement of direction of travel (Ex: "traveling west") can be set as the directional message or added (in field) to the custom information message.
- Allows for extended push priority (mutes entire intersection except selected crosswalk to minimize confusion caused by other sounds).
- Has synchronized sounds throughout intersection; reduces noise clutter.
- All inputs and outputs are optically isolated; eliminates need for ped button isolators.
- Can provide special messages throughout intersection such as "Emergency vehicle approaching, clear intersection immediately", or a similar warning message regarding an approaching train if desired.
- Push button or system failure defaults to transmitting a constant pedestrian call; standard push buttons can fail open.
- Adjustable extended push time from 0 to 6 seconds in .5-second increments can be set by installer.
- Ethernet port for remote access to status.
- Audio messages can be customized and changed via USB port on EPBS.
- EPBS and CCU2EN firmware updating via USB.
- CCU2EN can operate with all old version PBSs, all new EPBSs or a mixture of the two types of PBS.

Custom Message and Sound Options

- **Custom Locate Sound** – Plays a sound at selectable interval to assist a blind pedestrian in locating the Push Button Station.
- **Custom Information Message(s)** – Typically gives street being crossed with cross street, and other vital information. Up to two different languages can be programmed.
- **Custom Walk Message(s)** – Typically gives name of street the pedestrian is crossing. Up to two different languages can be programmed.
- **Custom Clearance Sounds/Countdown** – Plays a sound to let pedestrian know of clearance phase. This optional tone can be unique, or sound similar to the locate sound but played at a faster rate, or verbally count down the number of seconds in the clearance phase. Up to two different languages can be programmed in.

Advanced Sound Options

Custom Messages 1-3

These messages override any currently playing sound and play once each time the assigned input is activated. User sound files can replace default messages. See Advanced Options section for more information.

Factory Default Messages

- **Custom Message #1** – “Emergency vehicle approaching, clear intersection immediately.”
- **Custom Message #2** – “Train is approaching, clear tracks immediately.”
- **Custom Message #3** – <blank>

Safety

The EZCommunicator Central Control Unit (CCU2EN) AC Line is fused with a 250VAC 5A fast-blow fuse. The CCU2EN chassis is grounded through an earth ground connection to prevent shock hazard. All General Purpose Inputs are optically isolated and transient protected to protect any other equipment interfaced to the CCU2EN.

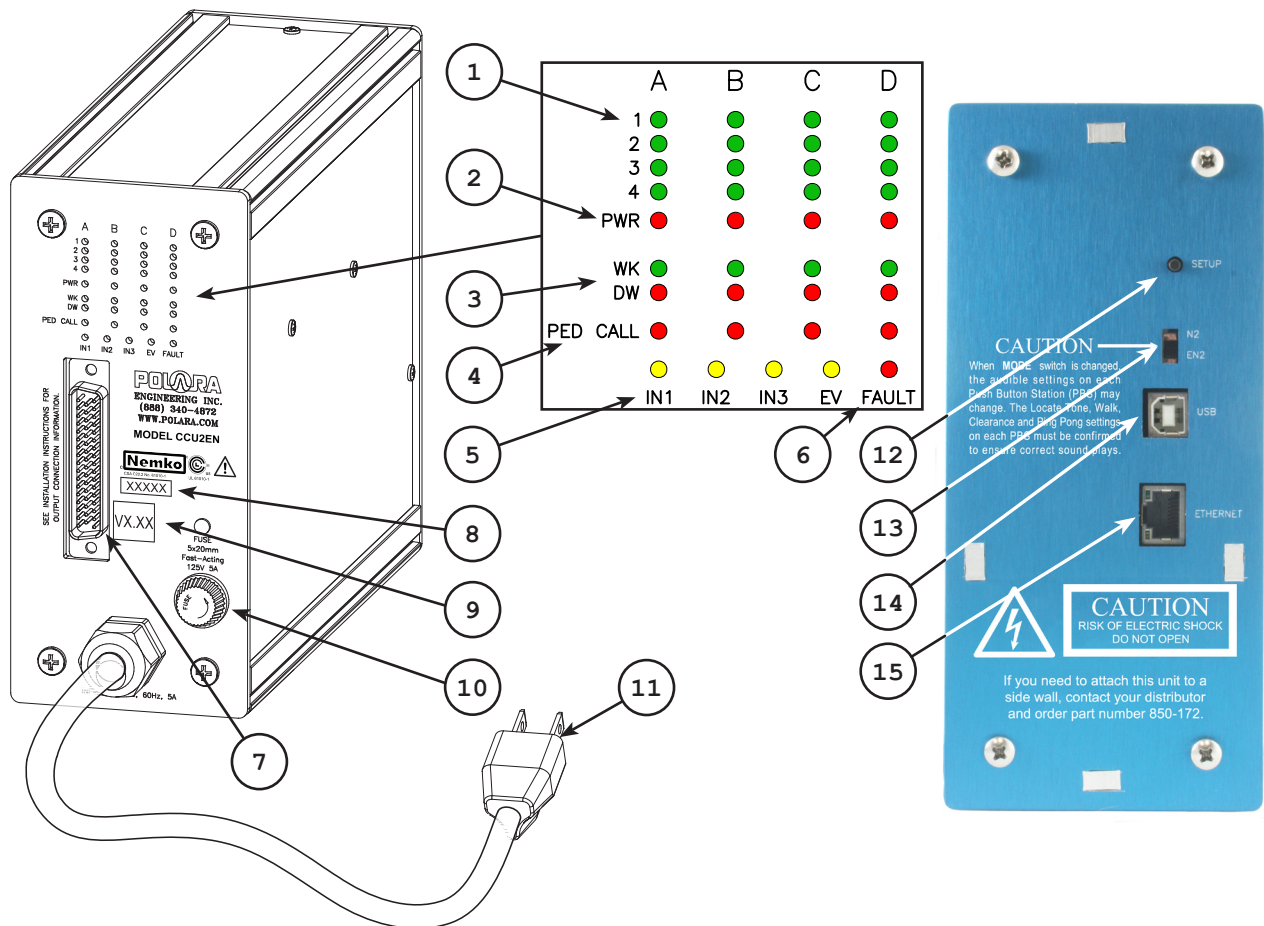
The CCU2EN is provided with a hard wired power cord with quick-disconnect capability. **Polara recommends that the CCU2EN be powered from the same 115 VAC lightning protected source and circuit breaker that powers the Traffic Controller. It should not be connected to a GFI protected outlet.**

EZCommunicator 2 Wire Navigator System (System)

EZCommunicator Central Control Unit (CCU2EN)

The CCU2EN installs inside the Traffic Cabinet and is powered by the AC supply mains (115 VAC). The CCU2EN is the power supply and signaling interface between the Traffic Signal Controller and the Push Button Stations which are located in the field. One CCU2EN can control up to 16 Push Button Stations (4 push buttons maximum per phase). The CCU2EN supports up to four Pedestrian phases. For each phase used, the minimum required connections are to the ped head walk and don't walk signals, and the ped call input. Additional functions can be obtained by utilizing its General Purpose Inputs.

The Ethernet 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.

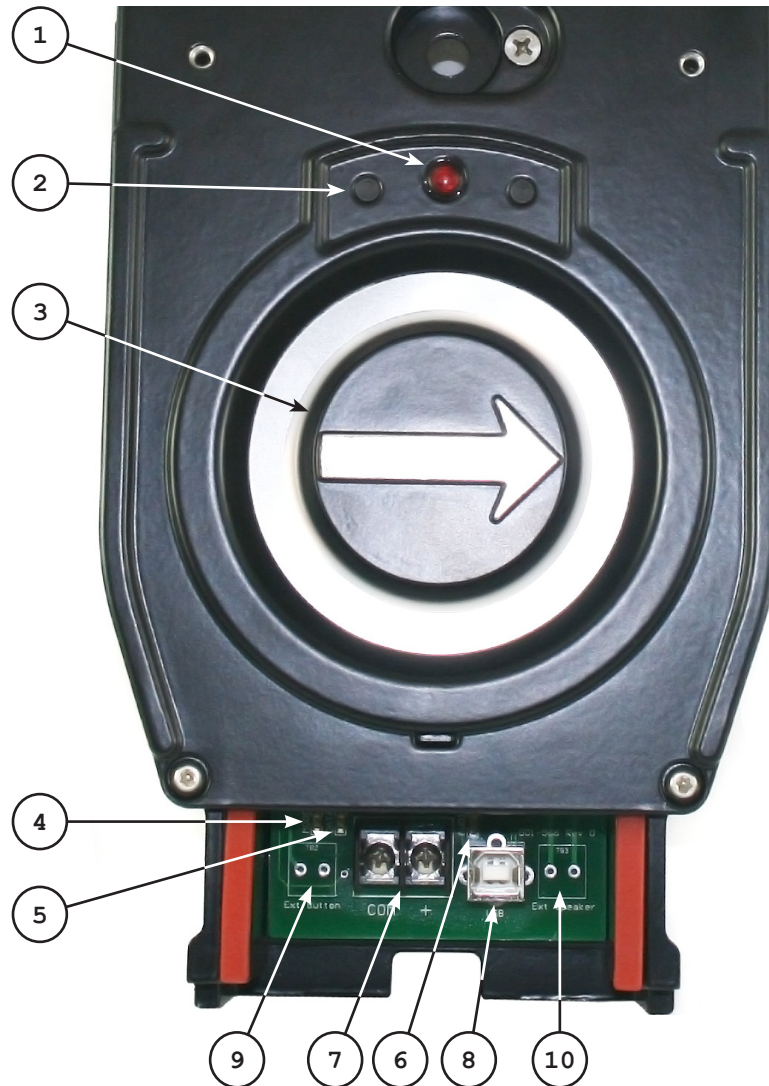


1. **PBS ID LEDs** – These green LEDs show installed PBSs. For each ID installed, there should be a corresponding LED on solid. A flashing LED indicates a fault condition. View the Health Log to identify the fault type.
2. **POWER LEDs** – These red LEDs are normally on for each channel in use. Short blinks indicate digital data activity. Longer off periods indicate the channel power is off.
3. **PED SIGNAL LEDs** – The red DW LED and the green WK LED should match exactly what the associated crosswalk ped sign shows. If both are off or both on, the channel power will be off.

4. **PED CALL LEDs** – These red LEDs turn on during a PBS button press, and during some fault conditions, indicating a ped call to the traffic signal controller.
5. **GP IN LEDs** – These yellow LEDs indicate an active General Purpose Input.
6. **Fault LED** – This red LED indicates a detected fault. View the Health Log to identify the fault type. A power cycle will clear the Fault LED.
7. **50 Pin Connector** – Provides the electrical interface to the traffic signal controller and the push button stations. Matching cable assembly is included.
8. **Date/Lot Code** – Can be traced to manufacturing information.
9. **Firmware Version** – Composite code identifying all internal versions.
10. **Fuse** – Replace only with same type and rating.
11. **Power Cable** – Connect to 115 VAC.
12. **Setup Button** – Clears stored IDs used for self test and searches connected PBSs to store IDs. Only IDs found at time of Setup Button press are included in self test. Should be pressed after setting IDs and any time an ID is added or removed.
13. **Mode Switch** – Set to EN2 (down) position if all PBSs are EPBS units. **Set to N2 if any older N2 units are connected.** EN2 mode operates PBSs at 18 VDC. N2 mode operates at 22 VDC. EPBS's switch modes automatically by sensing the voltage. **Note: N2 PBSs will power on in EN2 mode, but will not be recognized by the CCU2EN. No data communication is possible due to protocol differences.**
14. **USB Connector** – Connect to a PC using a standard USB A/B cable. Using Polara EZ APS Toolbox software, all monitoring and maintenance functions are available.
15. **Ethernet Connector** – Connect to a PC or network. Using Polara EZ APS Toolbox software, all monitoring and maintenance functions are available.

EZCommunicator Push Button Station (EPBS)

The EPBS is the pedestrian interface to the Navigator system. All sounds emanate from the EPBS. A Locate Tone is typically always playing during the Don't Walk and PED Clearance phases. The locate tone is what the blind pedestrian listens for to locate the EPBS. Both a momentary or extended button push will be registered by the EPBS by the latching on of the LED on the front of the EPBS. If the unit has been programmed with custom voice messages, the pedestrian can activate an information message with a (typically extended) push of the button. The system can provide custom messages in two different languages based on how long the button is pushed.



1. **Red LED** – This LED illuminates and latches on when the PBS button is pressed during Don't Walk or Clearance. It is off during Walk.
2. **Lenses for Configurator** – These lenses are used for transmission and reception of infrared signals while using the E-Configurator. Always point the E-Configurator top end toward these lenses.
3. **EPBS Button** – This button should be pressed to place a ped call. The raised arrow indicates the direction through the crosswalk. The button vibrates to indicate the Walk sign is on.
4. **Mode LED** – This LED can be used to monitor how the EPBS follows the pedestrian

cycle. On solid indicates Don't Walk. Rapid flash indicates Walk. Slow flash indicates Clearance.

5. **Data LED** – This LED illuminates to show data activity in either direction.
6. **Audio LED** – This LED illuminates while sound is playing and flashes during certain USB activity.
7. **Terminal Block** – This is the connection point for the wire pair coming from the traffic control cabinet. Correct polarity must be observed.
8. **USB Connector** – Connect to a PC using a standard USB A/B cable. Use Polara EZ APS ToolBox software to access EPBS options and features.
9. **External Button Terminals** – If a terminal block is installed in this location, an external push button (contact closure) may be connected here. The external button will place a ped call and enable the walk sound just as the internal button does.
10. **External Speaker Terminals** – If a terminal block is installed in this location, this unit should have an external speaker connected to these terminals.

Advanced Options

Configuring the General Purpose Inputs

The CCU Emergency Vehicle (EV) inputs correspond to Input #4.

INPUT #1 FUNCTION
INPUT #2 FUNCTION
INPUT #3 FUNCTION
INPUT #4 FUNCTION (EV)

All Inputs are typically driven by general purpose traffic controller outputs or by preemption device outputs. This allows complete timing coordination of all pedestrian operations within the intersection. Each input can be assigned to enable an Alternate Configuration or three possible custom messages. These functions can be assigned to a single channel, a pair of channels or all channels.

The Alternate Configuration function allows an input to switch the EPBSs on the affected channels to a separate set of configuration options. This Alternate Configuration can be read or updated using the E-Configurator Read Settings and Update Settings functions. This allows you to instantly change any or all of the configuration options by the application of an external signal. Some examples of uses for this would be to change volume levels, change voice messages, or turn off the locate tone. The Alternate Configuration would remain in effect only for the duration of the applied signal. The EPBSs power on in normal configuration, so a power failure would cause a change to Alternate Configuration to be lost.

The Special or Custom Messages can be used to enhance pedestrian safety. For example Message #1 default says: "Emergency Vehicle Approaching, Clear Intersection Immediately". The message can be triggered by the signal from a Preemption Sensor, which should give Blind Pedestrians advance notice before the Emergency Vehicle actually reaches the intersection. Message #2 default says: "Train is Approaching, Clear Tracks Immediately". The message can be triggered by the Train Preemption signal, which should give Blind Pedestrians advance notice before the Train actually reaches the railroad crossing. The MeSsaGe VOLume levels for the selected input determine the volume of the Special Message.

INPUT #4 (EV) is primarily intended for the Special Messages. It has four separate inputs and a separate Common (EV COM) which would typically connect to +24 volts. Connection of any EV Input to Logic Ground will trigger the message. Each time the signal is applied, the message will play. If the signal remains on, the message will not repeat.

Note: Other custom messages can also be programmed in these three locations!

The choices for this input function are as follows: NONE, ALternate CONFIGURATION, SPECIAL MeSsaGe 1, SPECIAL MeSsaGe 2, SPECIAL MeSsaGe 3
(Default = NONE)

INPUT #1 CONTROLS
INPUT #2 CONTROLS
INPUT #3 CONTROLS
INPUT #4 CONTROLS (EV)

This function controls which phase(s) the function is applied to. For example if a single crosswalk is to be controlled then choose the appropriate phase A, B, C or D. If you want to reduce the volumes at night but only want to do so on the phase(s) that are adjacent to a nearby residence you could do so.

The choices for this input function are as follows: A, B, C, D, AB, CD, ALL (ABCD)
(Default = ALL(ABCD))

IN#1 MeSsaGe VOLume MINimum

IN#2 MeSsaGe VOLume MINimum
 IN#3 MeSsaGe VOLume MINimum
 IN#4 MeSsaGe VOLume MINimum (EV)

This function sets the minimum volume level for the specified function. The Auto Volume adjustment will not go below this setting. This volume level is adjustable from 0% to 100% of the maximum volume output in 5% steps. (21 choices)
 (Default = 5%)

IN#1 MeSsaGe VOLume MAXimum
 IN#2 MeSsaGe VOLume MAXimum
 IN#3 MeSsaGe VOLume MAXimum
 IN#4 MeSsaGe VOLume MAXimum (EV)

This function sets the maximum volume level for the specified function. The Auto Volume adjustment will not go above this setting.

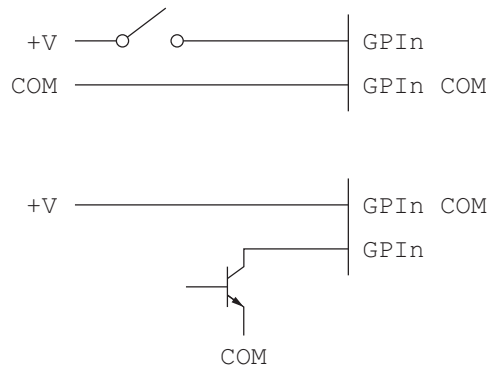
This volume level is adjustable from 0% to 100% of the maximum volume output in 5% steps. (21 choices)
 (Default = 80%)

Using the General Purpose Inputs

The General Purpose Inputs (GPIn) are activated by applying a voltage. The recommended input is 12-36V AC or DC. The Inputs are optically isolated. These connections are located on cable #3.

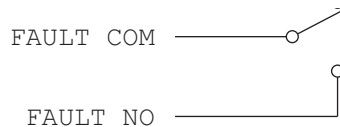
The recommended connection method uses the typically available +12 or +24 volts in the traffic cabinet, which may be connected to GP In COM or EV COM. Then the input is activated by a connection to Logic Ground.

If your input signal is a contact closure, you may use the +V output from the CCU as a voltage source as in the following examples:



Fault Output

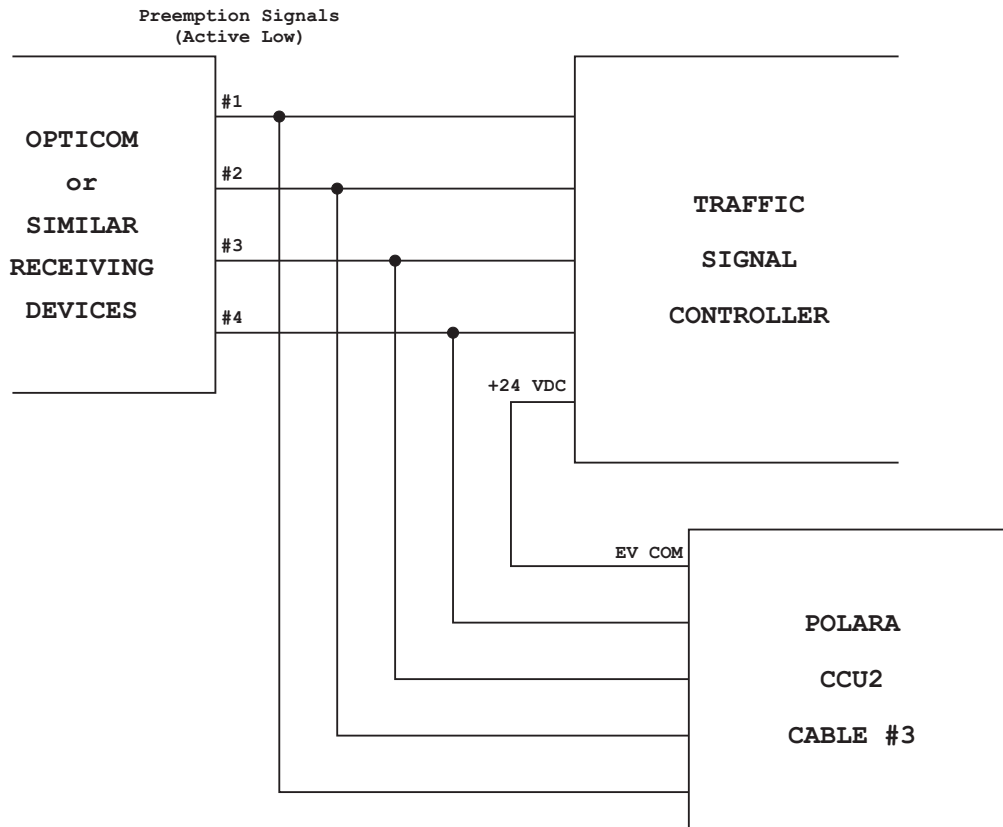
The Fault Output is a contact closure as shown:



This can be used to trigger an alert if there is an available means of doing so.

Any fault which results in lighting the Fault LED on the front of the CCU will activate the fault relay. In addition, the relay will be in the active state if the CCU2 AC input power is lost. To clear the fault condition, the CCU must be power cycled.

Example of Four-Way Emergency Vehicle Message Wiring



Ped Station Monitor – Technical Description

Polara's Ped Station Monitor (PSM) function is incorporated within the CCU2EN. The purpose of this feature is to prevent a push button station from indicating that a walk sign is on when it is actually off. Since the CCU2EN is directly connected to the ped sign wiring, it constantly monitors the status of the ped sign. Each EPBS has an ID assigned, which is included in a special code that is transmitted repeatedly to the CCU2EN while the EPBS is in WALK mode. Each time the CCU2EN receives one of these special codes, it checks to see if the walk sign is on. In the event that the walk sign is not on, the CCU2EN immediately transmits a Don't Walk command, then turns off power to the channel. This event is saved to the Health Log as a Data/PSM Fault, and the channel and received ID are listed with the fault. The channel power is restored after 10 seconds. If an identical event takes place within 5 minutes, the channel is again shut down and remains off until the Setup Button is pressed. This second event is similarly saved to the Health Log except as a EPBS PSM Failure. Polara offers a special test device, the EZ210 Conflict Tester, which can be used to test and verify operation of this feature.

EPBS Self Test – Technical Description

The CCU2EN and connected EPBS units exchange some special data every 30 seconds to verify that each EPBS is able to communicate. After all IDs are assigned, the Setup Button should be pressed. At this point, the CCU2EN sends separate requests for a response to every possible ID. Those IDs that respond are saved in the CCU2EN in non-volatile memory, so that a power off does not cause this data to be lost. During normal operation, at each 30 second interval, the CCU2EN sends a request to each saved ID to send a response. This can be observed on the CCU2EN LEDs as a quick blink of all four PWR LEDs followed by quick blinks of each of the illuminated ID LEDs. If a EPBS fails to respond, its ID LED will turn off. The CCU2EN shuts off power to the channel to reset the EPBS units. If the same EPBS fails to respond at the next test,

an EPBS Self Test Failure event is recorded in the Health Log, the associated green ID LED on the CCU2EN flashes, and the PED CALL for that channel is turned on. If, in a future 30 second test, this ID again responds, a EPBS Recovered event is recorded in the Health Log, the associated ID LED stops flashing and the PED CALL is turned off.

Power Down Reset

Any time the CCU2EN is powered off for more than one second, then powered on, it does an extensive power up sequence. It starts with a scan of the LED panel, then keeps the channels off for 10 seconds. This assures that in case of a power interruption, all the EPBSs are fully reset. Following this is a second scan of the LED panel, then the operating channels will power on one at a time. About 3 seconds after receiving power, the EPBS units should start operating normally. In order to ensure a complete power on reset it is recommended to leave the CCU2EN powered off for at least 10 seconds before re-powering it back on.

EN2 Mode / N2 Mode Differences

The EZ Communicator 2 Wire EPBS is capable of operating in two modes. EN2 mode makes available all of the new features, while N2 mode allows the EPBS to emulate the older generation of 2 Wire Navigators. N2 mode is designed to operate as closely as possible to the older models. Because of the new options available in the EPBS, switching between modes can possibly result in a change in operation. This will depend entirely on which configuration options are currently selected.

This is what to expect if you switch from EN2 mode to N2 mode:

If the current EN2 Walk Mode Sound is one of these: CUSTOM MesSaGe 2 ("Walk Sign is On"), CUSTOM MesSaGe 3, WALK SIGN is on for ALL Xs (Crossings), RAPID TICK 1, RAPID TICK 2, RAPID TICK 3, CANadian MELODY, AUSTRALIAN Melody, the N2 Walk Mode Sound will change to Standard Msg.

If the current EN2 Clearance Mode Sound is one of these: TONE 4, CANadian MELODY, the N2 Clearance Mode Sound will change to TONE 1.

If the EN2 Locate Sound is TONE 4 the N2 Locate Sound will change to TONE 1.

If the EN2 Walk Ping Pong or Clearance Ping Pong is ODD or EVEN, the N2 option will change to YES.

This is what to expect if you switch from N2 mode to EN2 mode:

If the current N2 Walk Mode Sound is one of these: CUCKOO + STandard, CUCKOO + CuSToM, CHIRP + STandard, CHIRP + CuSToM, the EN2 Walk Mode Sound will change to Standard Msg.

Clearance Mode Sound – No Change

Locate Mode Sound – No Change

If the N2 Walk Ping Pong or Clearance Ping Pong is YES, the EN2 option will change to ODD.

If operating in N2 mode and the desired sound is not available as a configurable option, the desired sound may be uploaded to the EPBS using the Polara EZ APS Toolbox software. Any messages utilized in EN2 mode which are desired for use in N2 mode must be programmed in a slot which exists in both modes. For example, if a customer needs Maryland Rapid Tick, then that sound must be programmed in Custom Message 1 location which is usable in both modes.

If a customer needs a "Click" sound as the Push Confirmation Message for use in N2 mode to match other units in the field, then the click sound must be programmed in the "Wait" sound location in the EPBS.

Default sounds/wave files must be requested. They are not provided with the programming

software.

How to Create and Update Audio in the EPBS

See "Preparing Custom Voice Messages" instruction sheet at www.polarara.com.

How to Update Firmware in the E-Navigator System

The EZ510 Security Box is the preferred method of performing firmware updates in the EZ Communicator products due to its simplicity. However, both the EZ APS ToolBox and the EZ510 Security Box are equally capable of performing firmware updates. **One important thing to note is that while performing firmware updates, neither the EPBSs or the CCU2EN can be operating in N2 Mode.** In order to ensure a trouble free firmware upgrade process, the following steps should be followed:

1. Ensure that the Mode switch on the back of the CCU2EN is in the EN2 position.
2. Unplug the 50-Pin connector from the front of the CCU2EN and press the Setup button on the back of the CCU2EN. This will remove all green lights showing detected buttons on the LED panel.
3. Plug the 50-Pin connector back into the CCU2EN. **DO NOT PRESS THE SETUP BUTTON AT THIS TIME.**
4. Upgrade all EPBSs and the CCU2EN using the EZ510 Security Box (Preferred Method) or the EZ APS ToolBox.
5. Once all equipment has been upgraded, set the IDs in the EPBSs, Change the CCU2EN Security Code, and press the Setup Button on the back of the CCU2EN.

How to Perform a Communications Test Between the CCU2EN and the EPBSs

If the CCU2EN and all EPBSs on a particular channel have SP1 firmware, you can perform a communications test to each individual EPBS. This can be very helpful in determining whether or not you have a reliable, low resistance connection between the CCU2EN and each EPBS. One particular instance in which this test is beneficial is when you get a "MATCH FAILS" message on the EZ Configurator when trying to log in at an EPBS. With a PC connected to the CCU2EN using a USB A/B cable, open the EZ APS ToolBox application and log in using your security code. Once logged in, click on the Communications tab near the top of the screen. If any SP1 EPBSs are installed there will be a Test button for each SP1 EPBS. Click on the Test button for the corresponding EPBS that you would like to test communication to. You will see in the grids on the right of the screen either 1's or 0's returned. If all 0's are returned and the background color for each cell in the grid is green, then there were no communication errors to that button. If any of the cells have 1's in them, then the background color of that cell will turn red indicating a communication failure. You can repeat the testing as many times as you would like by clicking on the test button again. If you see that there are continual communication failures, inspect your wiring and make sure all crimps and splices are of good quality and that the overall loop resistance of that particular pair of field wires is less than 1.5 ohms.

How to Reset the Security Code

The Security Code is stored only in the CCU2EN and is requested from the CCU2EN by the EPBS when logging in at the button. What this means is, if you are able to log in at even just one EPBS on the intersection but you get a "MATCH FAILS" for other EPBSs on the intersection, the security code you are using is correct and the buttons that you are having trouble logging into have a communication problem back to the CCU2EN. If you are not able to log in to any EPBSs at the intersection then it is likely that the security code has been inadvertently changed. If this is the case, you can reset the password using the EZ APS ToolBox application. From the login screen, click the Generate Challenge Code button and you will see a pop-up window with a set of four numbers and a telephone number to call to receive a verification code. Enter the verification code in the fields on the login screen from left to right then click the Reset Password button. This will reset the security code to AAAA. You can now log in

using the AAAA security code. It is recommended that you immediately go to the Setup/Security tab and change the security code to one of your choosing.

How to View SNMP Traps Sent from the CCU2EN

The CCU2EN with SP1 firmware is capable of automatically sending trap notices for the following events:

- PBS Self Test Failure
- PBS Low Voltage Failure
- PBS PSM Failure
- PBS Self Test Recovered
- CCU Restarted
- CCU Power Lost
- CCU Initial Defaults Written
- Password Changed via EConfigurator
- Password Changed via USB
- Password Changed via Ethernet
- Data PSM Fault
- Swapped Wires Fault
- Voice Message Runaway
- Password Reset to Default

In order to receive and manage the reception of trap notifications you will need a trap receiver software utility. Most SNMP managers have the ability to monitor for traps and there are many free dedicated trap receiver applications available for download online. Using the EZ APS ToolBox connected to the CCU2EN, click on the Setup/Security tab at the top of the window and change the trap IP addresses to the IP address of the PCs (up to 3) that you are going to use to monitor for trap notifications. Traps are sent to port 162 on your PC and this port will need to be unblocked from your firewall. Once you have your trap receiver application installed, you can configure it to send you automatic email notifications any time a trap is received.

Health Log Fault/Event Descriptions

- PSM Self Test Failure
Every 30 seconds the CCU performs a self test which requests a response from each button on the intersection. If a button does not respond, the CCU will power off the channel to restart the button. 30 seconds later a request is sent again and if a button does not respond the second time, the CCU will log a PSM Self Test Failure in the log and it will lock in a Ped call. **Note: The self test functionality requires that all buttons have their IDs set correctly. If a EPBS does not have its ID set, it cannot participate in the self test and an event will not be logged.**
- PBS Low Voltage Failure
This event is logged whenever a channels voltage falls below an acceptable level for more than 5 seconds.
- PBS PSM Failure
This event is triggered whenever the internal Ped Station Monitor recognizes the first occurrence of a PSM fault. The specific ID or channel that the fault occurred on will be logged with the fault.
- PBS Self Test Recovered
This event is logged in the health log when a EPBS that was previously

unresponsive and has failed the self test begins responding again to the self test.

- CCU Restarted

This event is logged any time the CCU powers on.

- CCU Power Lost

This event is logged any time the CCU loses power for more than 1 second.

- CCU Initial Defaults Written

This event is logged when the initial configurations are programmed into the unit at the factory.

- Password Changed via EConfigurator

This event is logged any time the password is changed via the EConfigurator.

- Password Changed via USB

This event is logged any time the password is changed via the EZ APS ToolBox.

- Password Changed via Ethernet

This event is logged any time the password is changed via an Ethernet connection using the EZ APS ToolBox.

- Data PSM Fault

This fault is logged if two PSM Failures occur on the same channel/ID within the span of 5 minutes. When this fault is logged, the channel that it occurred on will be powered off and a constant ped call will be placed until the setup button on the back of the CCU is pressed.

- Swapped Wires Fault

This fault is logged if the walk and don't walk wires connecting the CCU to the load switch outputs have been reversed.

- Voice Message Runaway

This event is logged if there is an error with trying to play an audio message.

- Password Reset to Default

This event will be logged any time the security code is reset to the default AAAA code.

Creating a Knockdown File

To create a knockdown file using the EZ APS ToolBox, navigate to the Firmware Updating tab while connected to an EN2 EPBS (or in EN2 Offline mode). Click the Make EZ510 Knockdown File button and enter the password for the EN2 EPBS you wish to perform the knockdown feature on. Follow the prompts to save the file to the desired location on your PC or Flash Drive. See the EZ510 operation manual for instructions on how to perform the knockdown function.

Loading and Saving Configurations using the EZ APS ToolBox

There are three options for loading and saving configuration profiles. One is that you can save just one individual configuration profile (Default, Alternate 1, Alternate 2, or Alternate 3). You can also save a profile that contains all four configuration profiles in the same file. Lastly, you can save an entire intersection profile, which will save all configurable settings (EPBS Configurations, CCU Configurations and Calendar Settings) for the CCU2EN and every SP1 EPBS located at the intersection into one single file.

The file extensions for these types of files and how to save/load them are as follows:

- **Individual Profile:**

From either the CCU Configuration Tab or the EPBS Configuration tab, click

the Save button at the top of the configuration column. Follow the prompts and save the configuration profile to the desired location on your PC. These files can now be opened by clicking the Open button at the top of each configuration column. A CCU configuration profile will be saved with a .ccuc file extension. An individual EPBS configuration profile will be saved with a .en2c file extension.

- Combined Default, Alt1, Alt2, and Alt3 Profile:

To save a combined configuration profile for an EPBS, simply click File from the menu bar at the top of the application then click "Save EPBS Profile As..." and follow the prompts to save the file to the desired location on your PC. This file can now be loaded by clicking File, then "Open EPBS Profile". A combined configuration profile will be saved with a .ccup file extension.

- Entire Intersection Profile:

To save an entire intersection profile, navigate to the CCU Configuration tab while connected to an SP1 CCU through USB. Click the Save Current Intersection Configuration to File button. Follow the prompts to select a location to save the file. The CCU will then retrieve the configurations from each installed SP1 EPBS and will store this data along with the CCU configuration data into one file. An entire intersection configuration profile will be saved with a .prof file extension. You can not load this file by clicking the Restore Intersection Configuration from Profile button on the CCU Configuration tab. You can also compare this saved profile to an intersections current configurations and view a PDF stating if there are any discrepancies between the configurations stored in the file and the configurations currently active on the intersection. To do this, simply click the Compare Current Intersection to Saved Profile button and follow the prompts.

Default and Field Settings

City _____ State/Province _____ Install Date _____

Intersection: _____

Street: _____
 Corner: _____
 ID: _____
 Phase: _____

Defaults

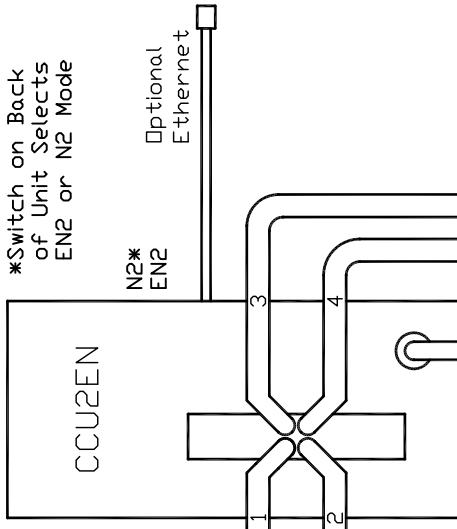
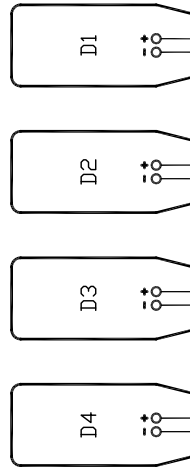
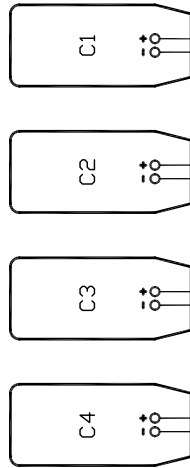
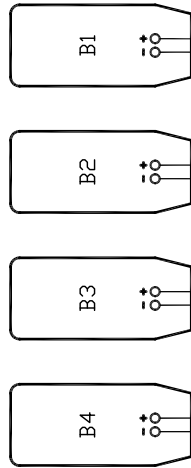
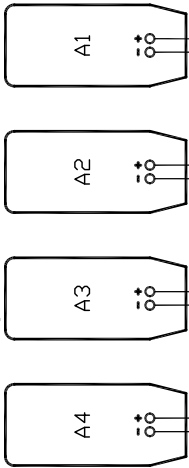
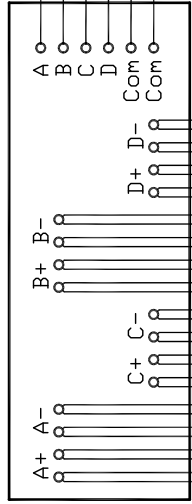
LOCATE VOL MIN	0%	_____	_____	_____	_____	_____	_____
LOCATE VOL MAX	50%	_____	_____	_____	_____	_____	_____
INFO MSG VOL MIN	65%	_____	_____	_____	_____	_____	_____
STD WALK VOL MIN	30%	_____	_____	_____	_____	_____	_____
STD WALK VOL MAX	60%	_____	_____	_____	_____	_____	_____
EXT WALK VOL MIN	60%	_____	_____	_____	_____	_____	_____
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	BUTTON PUSH	_____	_____	_____	_____	_____	_____
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: _____

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

EN2 Push Button Stations
 Four PBSSs per Channel
 Only in EN2 Mode

Interconnect Board



*Switch on Back of Unit Selects EN2 or N2 Mode

N2* EN2

Optional Ethernet

AC L
 AC N
 Earth

