



# **PedConnex® User's Manual**

**906-0022**

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## 2 Introduction

### 2.1 About PedConnex®

- The purpose of this document is to describe the operation of *PedConnex®*, a Windows software utility used to configure PedSafety APS devices.
- PedConnex® comes packaged with useful generic audio files and also supports fully custom audio to achieve different tones, speech messages, voices, genders, languages, etc.
- Custom audio can be obtained from PedSafety free of charge or created by the user. The following audio formats are supported:
  - OPUS (requires Guardian®, Guardian® Mini, or ABD with firmware 7.5.0 or newer)
  - WAV – 16kHz, Mono, 8-bit or 16-bit
  - *Instructions for generating custom audio are given in **Section 5 Creating Custom Audio**.*

### 2.2 Installing PedConnex®

- Download the PedConnex® setup file from <https://www.pedsafety.com/downloads/>
- Extract the .zip and run the setup .exe file. Necessary drivers are installed automatically.
  - **Note:** Portable PedConnex® is also available, which does not need to be installed.
  - \*\* Legacy Guardian®, Guardian® Minis, and Beacons running firmware 6.5 or earlier require legacy PedConnex® version 5.8.3, available for download in portable form.

### 2.3 Additional Information

- For installation instructions, see the Quick Wiring Guide and Installation Manual found at <https://www.pedsafety.com/product-guides-and-manuals/>
- Reference the PedSafety Intersection Planning Form for location-specific information found at <https://www.pedsafety.com/intersection-planning-form/>

### 2.4 Contact Information

- The first line of contact should be the distributor that the system was purchased from. If you are unable to contact the distributor, contact PedSafety directly.
  - PedSafety Tech Support: 1-208-345-7459 Option #2

## 3 System Configuration

### 3.1 Setup Tab

- The Setup Tab is automatically displayed when PedConnex® starts. It provides most of the basic functions needed to set up an APS device.
- The Setup Tab is divided into 3 sections: Interaction Buttons, Configuration Parameters, and Audio Files.

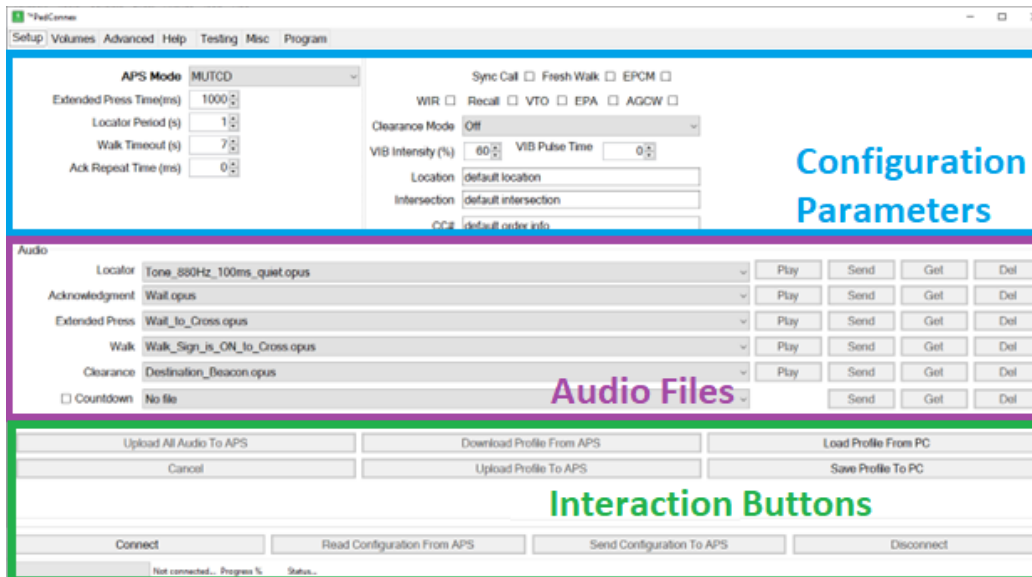


Figure 1. The 3 sections of the PedConnex® Setup Tab.

#### 3.1.1 Setup Tab - Interaction Buttons

- These buttons allow PedConnex® to Connect and Disconnect from an APS, as well as manage Configurations, Audio Files, and Profiles.
- **Making a Connection**
  1. Plug in a USB Cable to the APS and to the PC, then click **“Connect”**.
  2. Once the APS is configured, click **“Disconnect”** prior to unplugging the USB Cable.
- **Configurations, Audio Files, and Profiles**
  - **Configuration:** All configurable settings, selectable options, and audio volumes. Does not include audio files. Buttons include:
    - **Read Configuration From APS** – populate PedConnex® with configuration parameters from APS device.
    - **Send Configuration To APS** – send configuration parameters from PedConnex® to APS device.
  - **Audio Files:** Audio files used for each APS audible indication. Buttons include:
    - **Upload All Audio To APS** – transfer all files selected in the **Audio Files** section of the Setup Tab. If a file is already found on the APS device, it will be activated without a file transfer. Old files will be deactivated and retained for future use.
    - **Legacy Operation:** For APS Devices running firmware older than 7.5.0, all selected files will be transferred to the APS. All existing files on the APS will be overwritten.
  - **Profiles:** A complete package including Configuration and all Audio Files. Buttons include:

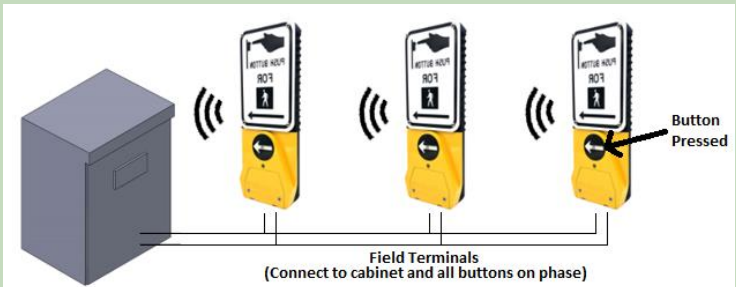
- **Download Profile From APS** – populate PedConnex® with configuration parameters and download audio files from the APS device.
- **Upload Profile To APS** – send configuration parameters and upload audio files from PedConnex® to the APS device.
- **Load Profile From PC** – populate PedConnex® with configuration parameters and audio files from the .zip profile saved to the PC.
- **Save Profile To PC** – save configuration parameters and audio files to the PC as a .zip for future use.

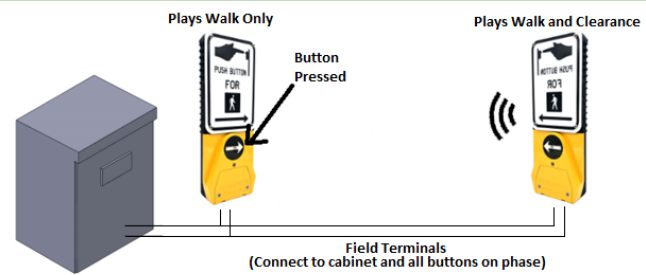
### 3.1.2 Setup Tab – Configuration Parameters

- PedConnex® provides 5 types of configuration parameters.
  - **APS Mode** – determines the fundamental operating mode of the APS Device, as well as what Configurable Settings and Selectable Features are available. Individual APS Modes are described in Sections 3.1.4 through 3.1.9.
  - **Configurable Settings** – settings that can be configured by setting a number.
  - **Selectable Features** – checkbox options that provide the APS with additional functionality.
  - **Clearance Modes** – selectable options that determine the behavior of audible indications during Flashing Don't Walk.
  - **Volume Settings** – found on a separate tab within PedConnex®. See Section 3.2 Volumes Tab.

Configurable Settings Quick Reference		
Name	Description	Compatible Modes
<b>Extended Press Time:</b>	Holding the pedestrian push button down for this time will play the location message. Time in milliseconds (1000 ms = 1 sec).	MUTCD, RRFB, Audible Beacon, TAC
<b>Locator Period:</b>	Interval time in seconds between locator audio indication.	MUTCD, RRFB, TAC
<b>Walk Timeout:</b>	Maximum time in seconds for walk indication to play. Setting to zero causes the Walk indication to play as long as the Walk interval is active and stops at the Clearance interval.	MUTCD, RRFB, Audible Beacon, TAC
<b>Ack Repeat Time:</b>	Time in milliseconds between repetitions of the acknowledgment message. Set to zero for Acknowledgement indication to play only once after a button press.	MUTCD, TAC
<b>VIB Intensity:</b>	Configures the percentage intensity of the vibrotactile indication.	MUTCD, TAC
<b>VIB Pulse Time:</b>	Sets the vibration time in milliseconds when the button is pressed.	MUTCD, TAC
<b>Walk Audio Delay:</b>	Delay time, in milliseconds, before the Walk indication is played after the start of the Walk or RRFB flasher activation.	RRFB, Audible Beacon
<b>FDW Audio Delay:</b>	Delay time, in milliseconds, before the Clearance indication is played after the start of Flashing Don't Walk.	Audible Beacon

Selectable Features Quick Reference		
Name	Description	Compatible Modes

<b>Sync Call:</b>	<p>Synchronizes audio between APS devices on a phase. All APS devices will play audio if one button is pressed.</p> <p>RRFB Mode Operation: The APS device plays its Walk indication any time the RRFB flashers activate.</p>  <p>Field Terminals (Connect to cabinet and all buttons on phase)</p>	MUTCD, RRFB, TAC
<b>Fresh Walk:</b>	When a button is pressed during Walk, the acknowledgment message will play instead of the Walk indication. A call will be placed to the controller at the start of Clearance and the button will play its Walk indication at the start of the next Walk interval.	MUTCD, TAC
<b>EPCM:</b>	The selected Clearance indication will only play following an extended press. <b>Extended Press Clearance Mode</b>	MUTCD
<b>WIR:</b>	Walk and Clearance indications will play every cycle even without a button press. The APS will not force the phase into recall. <b>Walk In Recall</b>	MUTCD
<b>Recall:</b>	Forces phase into recall. Places a call and plays Walk and Clearance indications every cycle.	MUTCD
<b>VTO:</b>	The APS station's vibrotactile arrow will vibrate every Walk cycle even without a button press. <b>Vibrotactile Only</b>	MUTCD
<b>EPA:</b>	Walk and Clearance indications will only play following an extended press. <b>Extended Press Audio</b>	MUTCD
<b>AGCW:</b>	<p>If selected, volume adjusts during the Walk interval between each loop of the Walk indication. <b>Automatic Gain Control in Walk</b></p> <p><b>Legacy Operation:</b> Firmware older than 7.0.3 only supports AGCW for generic audio messages.</p>	MUTCD

Clearance Modes Quick Reference		
Name	Description	Compatible Modes
<b>Off:</b>	The locator tone resumes during Flashing Don't Walk.	MUTCD, Audible Beacon, TAC
<b>Always On:</b>	Clearance indication always plays during Flashing Don't Walk following a short or extended press.	MUTCD, Audible Beacon, TAC
<b>Destination Beacon:</b>	<p>Plays clearance audio only from the opposite side of the street from where the button was pressed.</p>  <p>Plays Walk Only      Button Pressed      Plays Walk and Clearance</p> <p>Field Terminals (Connect to cabinet and all buttons on phase)</p>	MUTCD

	<b>Note:</b> Installations with 3 or more APS devices on a phase require advanced configuration for proper operation. See <b>Location Settings for Destination Beacon</b> under <b>Section 3.3 Advanced Tab</b> .	
<b>Countdown:</b>	Plays an audible countdown during Flashing Don't Walk. Requires one cycle after each bootup to calibrate before audio will play.	MUTCD, Audible Beacon, TAC

### 3.1.3 Setup Tab – Audio Files

- PedSafety APS products ship pre-loaded with a library of generic files, as well as custom files upon request. If audio needs to be updated in the field, this section allows the user to change each of the 6 APS Audio Indications.
  - APS Audio Indications:** Select an OPUS or WAV file from a dropdown menu for each indication or select “Add file to list...” to add custom audio.
    - Locator:** Repeats a tone to guide the pedestrian to the APS.
    - Acknowledgment:** This audio indication plays as soon as the button is pressed.
    - Extended Press:** This audio indication provides a location or informational message.
    - Walk:** This audio indication is played during the Walk phase.
    - Clearance:** This audio indication plays during Flashing Don't Walk phase.
    - Countdown:** This collection of audio files plays the numerical countdown audibly during the Flashing Don't Walk phase. A special .advcount file format is required. The .advcount file is factory loaded and can be suppressed by unchecking a checkbox to save time when uploading a profile.
 

☒ Countdown    4WireCntdwnTTS.advcount
- The **Audio Files** section of the Setup Tab provides 4 buttons for interacting with each individual audio indication:
  - “Send”:** Uploads the selected audio file to the APS. If a file with the same name already exists on the APS, the old file is overwritten. Otherwise, the old file will be deactivated but retained in memory for future use.
    - Legacy Operation:** For APS devices running firmware older than 7.5.0, the selected file is uploaded and the old file is overwritten.
  - “Play”:** Plays the file currently active on the APS, from the APS's speaker.
  - “Get”:** Downloads the currently active file from the APS and saves it to the PC.
  - “Del”:** Deletes the currently active file from the APS.

### 3.1.4 MUTCD Mode

- Used for signalized intersections complying with the MUTCD 11th edition.**
  - Idle:** APS plays locator tone indication.
  - Short Press:** APS plays its acknowledgment indication and LED turns on.
  - Extended Press:** APS plays location or informational audio. LED turns on if not already active.
  - Walk Interval:** LED turns off, walk indication plays, and button vibrates.
  - Clearance Interval:** Clearance or Countdown indication plays corresponding to the selected Clearance Mode. Returns to Idle at the end of clearance.

- **Note:** In the case of a recalling pedestrian phase, by default the Walk and Clearance functions only happen following a short or extended press. This can be modified using selectable options WIR or VTO

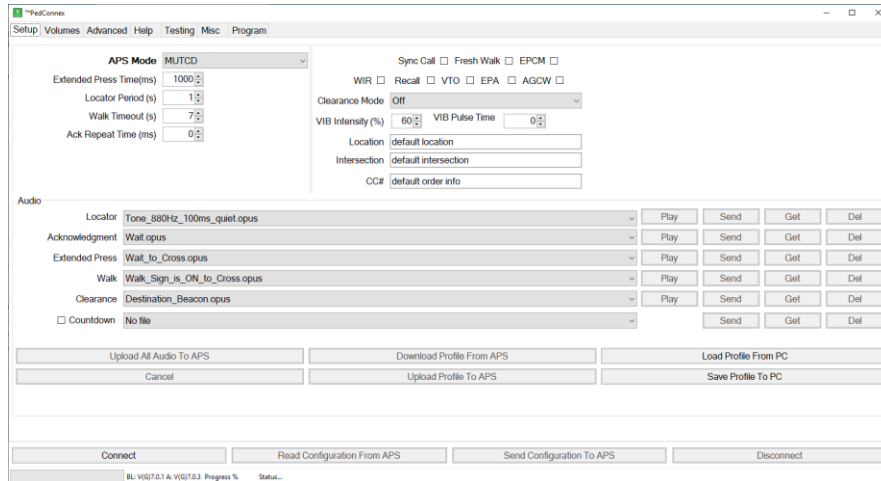


Figure 2. The PedConnex® Setup Tab in MUTCD Mode.

### 3.1.5 RRFB Mode

- Allows the APS to operate as an Audible Information Device for RRFB systems complying with the MUTCD 11th edition.
  - **Idle:** APS plays locator tone indication.
  - **Short Press:** APS plays its acknowledgment indication and LED flashes momentarily.
  - **Extended Press:** APS plays location or informational audio if present.
  - **RRFB Flasher Activation:** Walk audio indication plays and LED flashes repeatedly.
  - Clearance audio is disabled.
- **Note:** Default audio files and configurable parameters for RRFB mode ensure MUTCD-compliant operation with “Warning Lights are Flashing” speech message spoken twice and no vibration.

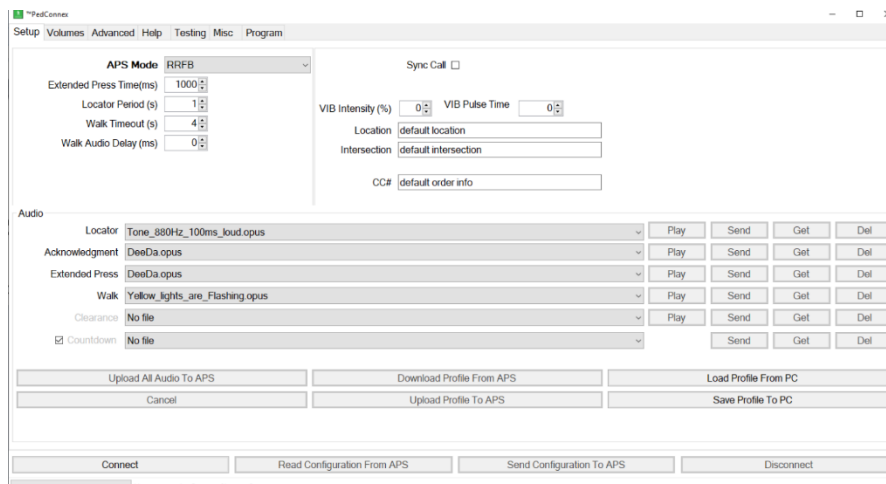


Figure 3. The PedConnex® Setup Tab in RRFB Mode.

### 3.1.6 Audible Beacon Mode

- Used for Audible Beacon Devices to project audio into the crosswalk.
  - **Idle:** APS waits for an extended press from another station on the same phase.



- **Walk Interval:** Walk audio indication plays.
- **Clearance Interval:** Clearance or Countdown audio indication plays. Returns to Idle at the end of clearance.
- Locator, Acknowledgement, and Extended Press audio is disabled.

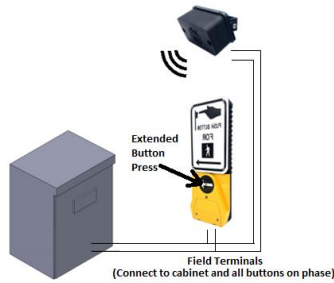


Figure 4. Audible Beacon Mode Activation Diagram.

The screenshot shows the 'PedConnex' software interface, specifically the 'Setup' tab for 'Audible Beacon Mode'. The 'APS Mode' is set to 'Beacon'. Configuration options include 'Extended Press Time(ms)' (1000), 'Walk Timeout (s)' (7), 'Walk Audio Delay (ms)' (0), and 'FDW Audio Delay (ms)' (0). The 'Clearance Mode' is set to 'Off'. Under the 'Audio' section, 'Locator', 'Acknowledgment', and 'Extended Press' are set to 'No file'. 'Walk' is set to 'Walk\_Signals\_ON\_to\_Cross.opus', and 'Clearance' is set to 'Destination\_Beacon.opus'. The 'Countdown' checkbox is unchecked. At the bottom, there are buttons for 'Connect', 'Read Configuration From APS', 'Send Configuration To APS', and 'Disconnect'. The status bar at the bottom indicates 'Not connected... Progress: DONE'.

Figure 5. The PedConnex® Setup Tab in Audible Beacon Mode.

### 3.1.7 TAC Mode

- Supports APS operation commonly used in Canada. Similar to MUTCD mode except Walk and Clearance audio indications only play following an extended press.

The screenshot shows the 'PedConnex' software interface, specifically the 'Setup' tab for 'TAC Mode'. The 'APS Mode' is set to 'TAC', and a Canadian flag icon is visible. Configuration options include 'Extended Press Time(ms)' (3000), 'Locator Period (s)' (1), 'Walk Timeout (s)' (7), and 'Ack Repeat Time (ms)' (0). The 'Clearance Mode' is set to 'Off'. Under the 'Audio' section, 'Locator' is set to 'Tone\_880Hz\_100ms\_quiet.opus', 'Acknowledgment' is 'DeeDa.opus', 'Extended Press' is 'DoubleBeep.opus', and 'Walk' is 'Percussive\_Tone.opus'. 'Clearance' is set to 'No file', and the 'Countdown' checkbox is checked. At the bottom, there are buttons for 'Connect', 'Read Configuration From APS', 'Send Configuration To APS', and 'Disconnect'. The status bar at the bottom indicates 'Not connected... Progress % Status...'.

Figure 6. The PedConnex® Setup Tab in TAC Mode.

### 3.1.8 Off Mode

- Allows an APS station to operate as an MUTCD compliant pushbutton without APS functions.

- **Short Press:** LED turns on. Plays acknowledgement message if present. (Dee-Dah is default.)
- **Walk Interval:** LED turns off.
  - All audio is disabled except Acknowledgement.

### 3.1.9 Test Mode

- Test mode is for hardware testing and is not for regular use.

## 3.2 Volumes Tab

- **The Volume Graph:**
  - PedConnex® provides a graphical interface for configuring audio volume and Ambient Gain Control (AGC) sensitivity. There are 4 components to the volume graph:
    - **Bubbles** – The slope of the line between the Bubbles represents how much the APS volume ramps up in response to ambient noise.
      - **Left Bubble** – APS volume in a quiet environment.
      - **Right Bubble** – APS volume in a noisy environment.
    - **Min/Max** – The green box between Min and Max represents the range of volumes that the APS is allowed to play.
      - **Min** – minimum volume that the APS will play. If set above the left bubble, this is the APS volume in a quiet environment.
      - **Max** – maximum volume that the APS will play. If set below the right bubble, this is the APS volume in a noisy environment.

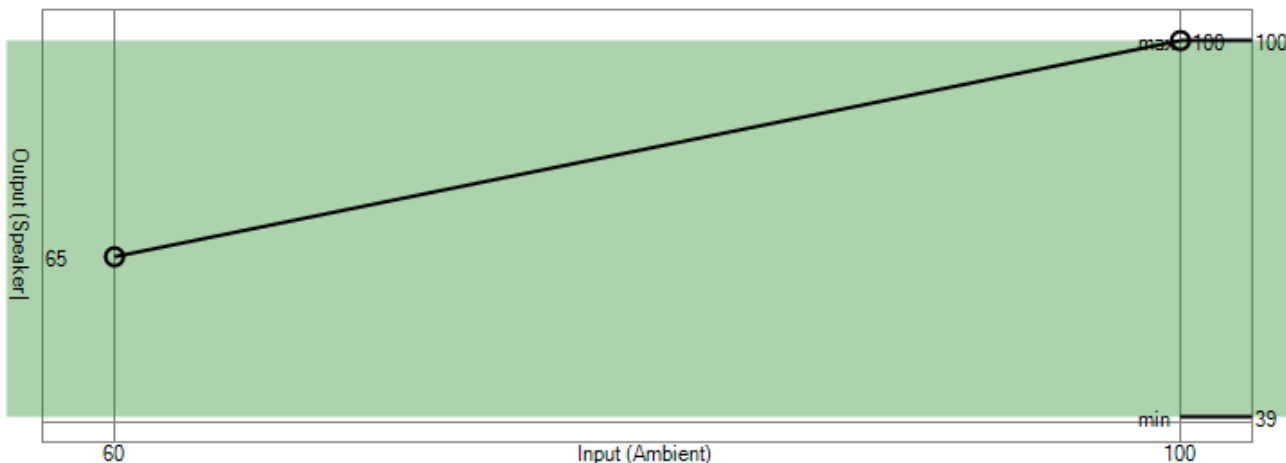


Figure 7. The Volume Graph: the basic tool for setting volumes in PedConnex®.

- **AGC Sensitivity:**
  - PedConnex® provides an AGC Sensitivity setting with Slow, Medium, and Fast options to determine how quickly the APS volume adjusts to ambient noises. A Fast setting will react quickly to all noises, while a Slow setting will ignore short bursts of noise.



Figure 8. The AGC Sensitivity setting determines the response time of automatic volume adjustment.

- **Night Mode:**

- PedConnex® offers Night Mode capability to adjust the volume based on the time of day, normally used for quieter operation at night. When enabled, the user can set the Start and End times for Night volume settings. These times must be in 24-hour format, and the APS device's clock must be set for correct operation.

Night Mode

☐ Night Mode

Start Hr/Min 20 0

End Hr/Min 8 0

Figure 9. Night Mode allows quieter volumes at certain times of day.

- **Volume Control Settings:**

- PedConnex® provides a total of 4 graphs for setting volumes. Independent graphs are provided for Locator and Non-Locator audio, and independent graphs are provided for Day and Night audio.

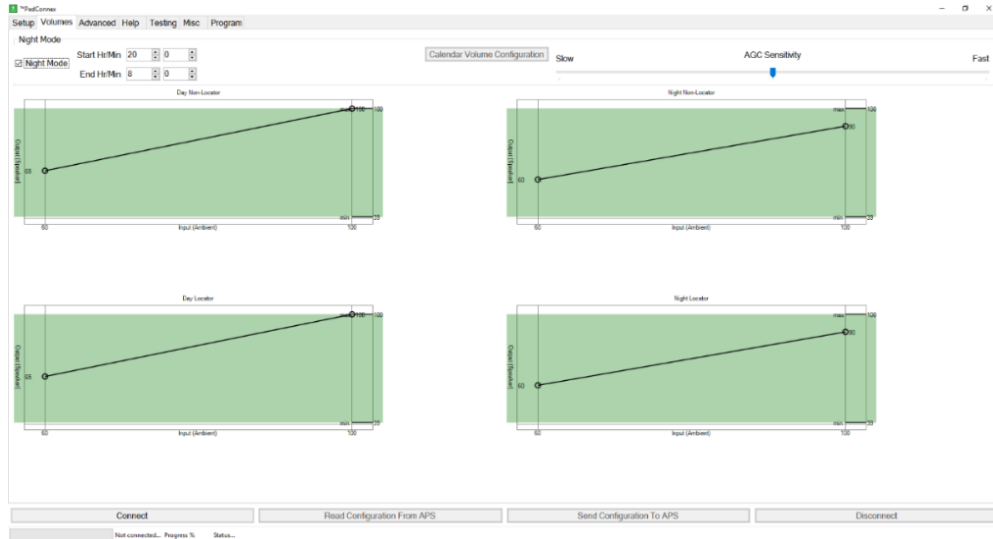


Figure 10. The PedConnex® Volumes Tab with Night Mode active. With Night Mode disabled, the graphs on the right are grayed out.

- **Calendar Volume Configuration:**

- Some intersections require time of-day volume control that depends on the day of the week. For example, downtown intersections may need the APS devices to stay louder later into the night only on weekends. Calendar Volume Configuration gives the ability to configure time-of-day volume controls for each day of the week individually. Note that the Night Mode configuration setting takes priority over Calendar Volume Configuration settings.

CalendarVolumes

PedConnex  
Campbell Company Configuration Software

VolumeControl

	Start Time		End Time		Locator Volume		Non-locator Volume	
	Hours	Min	Hours	Min	Low	High	Low	High
<input checked="" type="checkbox"/> Monday	20	0	8	0	50	80	50	80
<input checked="" type="checkbox"/> Tuesday	20	0	8	0	50	80	50	80
<input checked="" type="checkbox"/> Wednesday	20	0	8	0	50	80	50	80
<input checked="" type="checkbox"/> Thursday	20	0	8	0	50	80	50	80
<input checked="" type="checkbox"/> Friday	20	0	8	0	50	80	50	80
<input type="checkbox"/> Saturday	0	0	0	0	50	80	50	80
<input type="checkbox"/> Sunday	0	0	0	0	50	80	50	80
<input type="checkbox"/> Everyday	0	0	0	0	50	80	50	80

☒ Low ☐ Medium ☐ High ☐ Off

Apply Settings

Note: NightMode Configuration if selected, will take priority over other configurations.

Figure 11. The PedConnex® Calendar Volume interface allows time-of-day volume settings to be configured individually for each day of the week.

### 3.3 Advanced Tab

- The Advanced tab has several advanced features and administrative options.

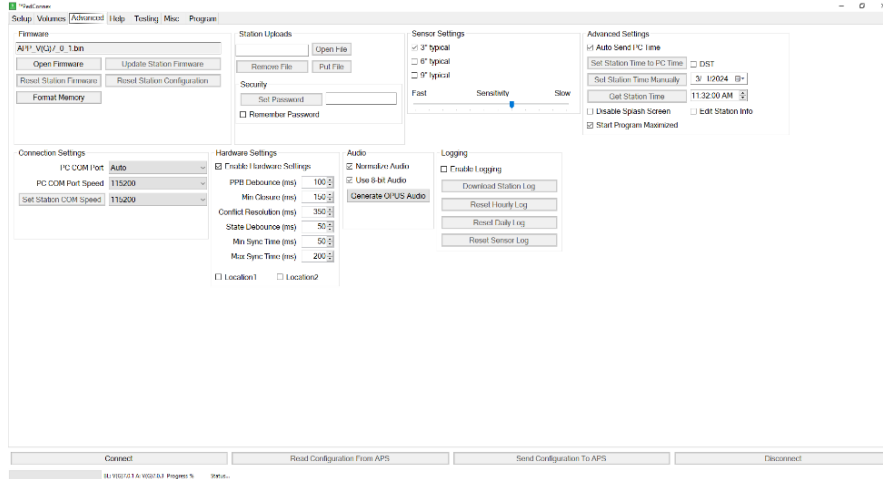


Figure 12. The PedConnex® Advanced Tab provides many advanced functions that are not typically necessary for the normal configuration of an APS device.

Firmware	
Please contact Tech Support at 208-345-7459 Option 2 prior to updating firmware.	
<b>Open Firmware:</b>	Open a .bin firmware file to apply to an APS device.
<b>Update Station Firmware:</b>	Update the APS device with the .bin firmware file selected above.
<b>Reset Station Firmware:</b>	Reset the APS device to the original firmware loaded at the factory.
<b>Reset Station Configuration:</b>	Reset the APS to the default configuration and volume settings. Does not affect audio files or clocks.
<b>Format Memory:</b>	Erases the APS's memory. Configuration and audio files will need to be re-sent.
Security	
<b>Set Password:</b>	Set a password that must be entered to connect to the APS device.
<b>Remember Password:</b>	Remember the password so you don't have to re-enter it when connecting again. <b>Note:</b> Only one password can be remembered.
Advanced Settings	
<b>Set Station Time to PC Time:</b>	This applies the PC's clock setting to the APS device's clock.
<b>Auto Send PC Time:</b>	Automatically update the APS device's clock to the PC's clock setting upon sending a configuration or profile to the APS device.
<b>Set Station Time Manually:</b>	Enter the desired date and time, then click this button to set the APS's clock.
<b>Get Station Time:</b>	Read the date and time currently set on the APS.
<b>DST:</b>	Configures the APS to automatically adjust its clock for Daylight Savings Time.
<b>Disable Splash Screen:</b>	Disable the PedConnex® splash screen that displays on startup.
<b>Edit Station Info:</b>	Select to allow editing of the Location, Intersection, and CC# information on the Setup Tab.

<b>Start Program Maximized:</b>	Starts PedConnex® in full screen rather than windowed mode.
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## Connection Settings

Please contact Tech Support at 208-345-7459 Option 2 prior to updating connection settings.

<b>PC COM Port:</b>	Select the PC COM port to connect to. Auto will automatically detect the correct COM port if only one APS device is plugged in.
<b>PC COM Port Speed:</b>	Changes the communication speed used by the PC when communicating to an APS device.
<b>Set Station COM Speed:</b>	Changes the communication speed used by the APS when communicating to a PC. Does not take effect until next connection.

## Sensor Settings

<b>3" Typical: 6" Typical: 9" Typical:</b>	Typical detection range of the touchless Wave sensor – may fluctuate $\pm 1"$ . Sensor automatically adjusts to maintain the correct detection distance across all environmental conditions.
<b>Sensitivity:</b>	Changes the response speed of the touchless Wave sensor. Faster settings respond to a fast wave of the hand, while slower settings require a slower hand wave.

## Station Uploads

**Note:** File upload is used for Bluetooth® or Wave-enabled APS devices. File Upload is not intended for transferring audio files. Please contact Tech Support at 208-345-7459 Option 2 prior to uploading files.

<b>Open File:</b>	Select a file to upload or remove.
<b>Put File:</b>	Upload the selected file to the APS device.
<b>Remove File:</b>	Remove the selected file from the APS device.

## Logging

<b>Enable Logging:</b>	Enable APS device to log data about activations, conflicts, reboots, sensor operation, etc.
<b>Download Station Log:</b>	Download log files from the APS device and save as a CSV file to the PC.
<b>Reset Hourly Log:</b>	Clear data from the hourly log.
<b>Reset Daily Log:</b>	Clear data from the daily log.
<b>Reset Sensor Log:</b>	Clear data from the Wave sensor log.

## Audio

<b>Normalize Audio:</b>	Equalize volume of WAV files based on the highest peak in the file.
<b>Use 8-bit Audio:</b>	Automatically convert WAV files to 8-bit format for faster transfer.
<b>Generate OPUS Audio:</b>	Convert WAV files into OPUS format for faster transfer – requires firmware 7.5.0 or newer. See <b>Section 5 Creating Custom Audio</b> for more details.

## Advanced Hardware Settings

<b>Enable Hardware Settings:</b>	Allows modification to the advanced hardware settings. Advanced Hardware Settings do not normally need modification. Please contact Tech Support at 208-345-7459 Option 2 prior to enabling!
<b>PPB Debounce:</b>	Time in milliseconds required to hold down the button before a short press is registered.
<b>Min Closure:</b>	Minimum contact closure time in milliseconds for a pedestrian call to be placed to the traffic controller.
<b>Conflict Resolution:</b>	Maximum time in milliseconds that Walk and Don't Walk signals may both be active before the APS registers a conflict. <u>RRFB Mode:</u> Maximum allowable time between toggles of a flashing RRFB signal applied to the APS device's DW input.
<b>State Debounce:</b>	Minimum time in milliseconds that a Walk or Don't Walk signal must be active before the APS registers the signal state.
<b>Min Sync Time:</b>	Minimum contact closure duration in milliseconds is required before the APS registers a Sync Call from a remote station on the same phase.
<b>Max Sync Time:</b>	Maximum contact closure duration in milliseconds that an APS will register as a Sync Call from a remote station on the same phase.

### 3.3.1 Location Settings for Destination Beacon

- Configuring the Destination Beacon clearance mode requires Location settings if 3 or more APS devices are installed on the same phase, such as when Guardian® and ABDs are used together.

Figure 13. Location Settings for Destination Beacon

- Without Location settings, all APS devices on a phase except the one pressed will play Clearance audio during Flashing Don't Walk. When ABDs are used, this will cause Clearance audio to play from both sides of the street as shown below, not just the destination side.

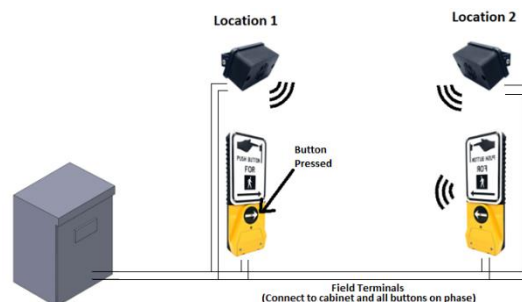


Figure 14. Without Location Settings – clearance audio plays from both sides of the street.

- To avoid this issue, configure all APS devices on one side of the street as Location 1 and all APS devices on the other side of the street as Location 2. Location 2 devices will play Destination Beaconsing audio only when Location 1 devices are pressed and vice versa.

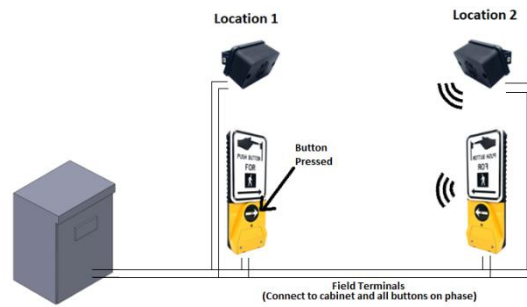


Figure 15. With Location Settings – Destination Beacon works as intended with multiple APS devices on a phase.

## 4 Setting a Password for the APS

- PedConnex® allows you to set a password to restrict USB access to the APS device. Note that if the password is forgotten, the APS will be inaccessible and must be returned to the factory for recovery.
  - **Steps to set password:**
    1. Connect to the APS and navigate to the PedConnex® Advanced Tab.
    2. Enter the desired password using only letters and numbers. Passwords are case-sensitive.
      - **(Optional)** check the “Remember Password” checkbox to have PedConnex® remember the password.
        - **Note:** Only one password can be remembered.
    3. Click on “Set Password”
  - **Steps to clear password:**
    1. Connect to the APS using the existing password. Navigate to the Advanced Tab.
    2. Delete the existing password from the input field, then click “Set Password”.
      - **Note:** If the APS does not have a password set, PedConnex® will connect to the APS with or without a password being entered.



## 5 Creating Custom Audio

### 5.1 Converting Files to OPUS Format

- Guardian®, Guardian® Mini, and ABD firmware 7.5.0 support the OPUS audio format. WAV files are still supported, but OPUS files transfer significantly faster.
- While PedSafety will provide custom OPUS files free of charge, many customers already have a library of WAV files for APS use. The Generate OPUS Audio button in the PedConnex® Advanced Tab provides a simple way to convert WAV files into the OPUS format as shown below.

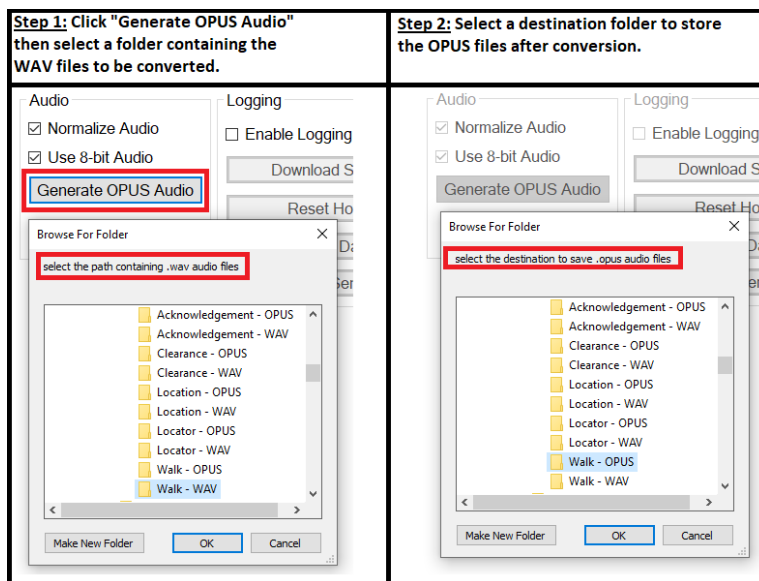


Figure 16. PedConnex® provides a simple way to convert WAV files to the OPUS format.

### 5.2 Recording Custom Audio Using Audacity®

- **Audacity can be downloaded from:** <https://www.audacityteam.org/download/windows/>
  - After opening Audacity, make sure that your Channels dropdown is set to Mono.
  - Then set your Project Rate to 16000 Hz.
  - Then click on the Record • Button, and Audacity will create a new .wav file.
  - Once the file is recorded, select “Export Audio...” from the File menu in Audacity.
- **See interface below:**

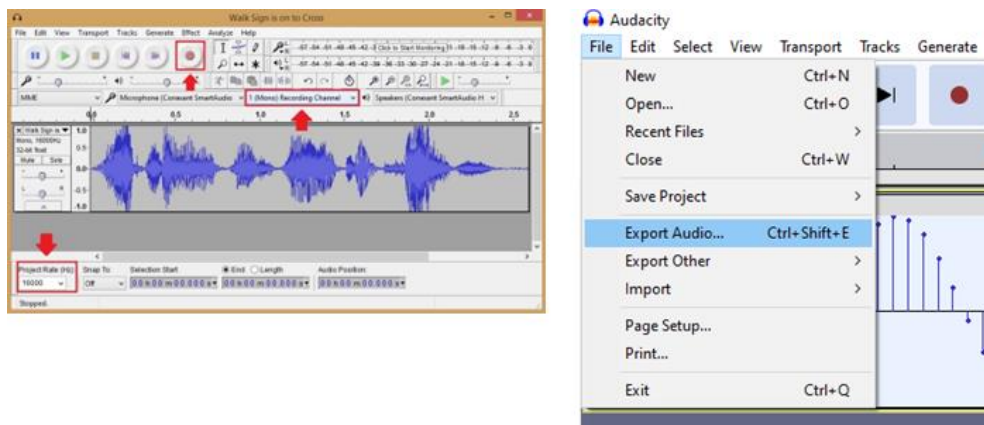


Figure 17. Audacity's interface for recording and exporting audio.

- OPUS and WAV export settings are shown below.
- (**Note:** OPUS requires firmware 7.5.0 or newer.)
- All files must have 16000 Hz for Sample Rate and Mono for Channels.
- **For OPUS files** set Bit Rate to 16 kbps for best results – do not change other OPUS settings.
- **For WAV files**, “Unsigned 8-bit PCM” may be used for faster transfer, or “Signed 16-bit PCM” may be used for higher quality audio.

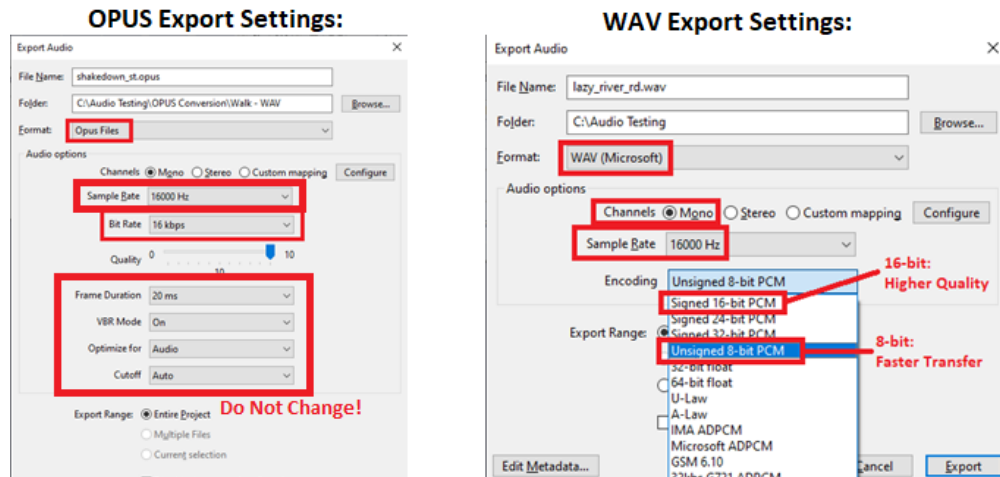


Figure 18. Correct settings for OPUS and WAV audio formats.

## 6 Appendix A: Acronyms, Abbreviations & Definitions

Term	Meaning
<b>Accessible Pedestrian Signal (APS)</b>	A device that communicates information about pedestrian signals in a non-visual format such as audible tones, verbal messages, and/or vibrating surfaces (MUTCD).
<b>Audio File</b>	Files containing audio data for APS indications.
<b>Automatic Gain Control (AGC)</b>	An APS volume control that is automatically responsive to ambient (background) sound.
<b>Base Station</b>	Integrated APS device that contains a button, vibrotactile arrow, speaker, and control logic. Abbreviated as "Station".
<b>CC#</b>	Campbell Company (PedSafety) Sales Order Number.
<b>Clearance Interval Indication</b>	Tones sounding during the pedestrian clearance interval that are differentiated from the WALK interval indicator (tones).
<b>Clearance Interval</b>	Flashing Don't Walk (FDW) pedestrian cycle.
<b>COM Port</b>	Serial communication port to a PC. Serial communication
<b>Intersection</b>	Cross streets for reference
<b>Location</b>	City, State or Province
<b>USB Port</b>	USB connection on PedSafety APS devices.
<b>.advcount file</b>	Special file format for PedSafety countdown audio.
<b>.bin file</b>	Binary APS firmware file.
<b>.wav file</b>	An uncompressed audio file format supported by all PedSafety APS devices.
<b>.opus file</b>	A compressed audio file format supported by Guardian®, Guardian® Mini, and ABD firmware 7.5.0 and newer.



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Revision	Revised By	Date
A	Zane Sapp: Initial release	1/09/2017
B	Brad Giesen: Added Profile functionality, TAC, and Beacon Modes	10/26/2018
C	James Elfering: Added EPCM, EPA, VTO, AGCW, DST and Calendar Function	1/13/2020
D	Travis Goldsby: Added Guardian® Wave parameters	10/28/2020
E	Travis Goldsby: Updated Advanced Tab info and images	2/19/2021
F	Josh Meier: Updated to Guardian® 7.5.0 firmware, and overall document cleanup	5/17/2024

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