



# PedConnex User's Manual

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# PedConnex User's Manual

## 906-0022

Document Revision History		
Revision	Revised By	Date
A	Zane	1/09/17
B	Brad. Added Profile functionality. Added TAC and Beacon Modes.	10/26/18
C	James. Added EPCM, EPA, VTO, AGCW, DST & Calendar Function	1/13/20

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## 2 Introduction

### 2.1 Purpose of this Document

The purpose of this document is to describe the operation of the *PedConnex* Utility.

### 2.2 Additional Information

- See the Installation Guide for installation instructions.
- Reference the Campbell Company Intersection Worksheet for location specific information.
- See the Installation Quick Guide for a brief graphical installation guide.
- See [www.pedsafety.com](http://www.pedsafety.com) to find the following information.

### 2.3 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 Campbell Company directly.

Campbell Company Tech Support: 1-208-345-7459 Option #2

### 2.4 Audio Messages

PedConnex includes generic audio files from the factory. Campbell Company also provides you with the option to create your own custom messages in a simple WAVE (.wav) format that can be easily uploaded via USB port from any computer. Other languages, gender narrative, and special percussive tones can be easily created and uploaded. Additional information in Section 5 - Audio Files using PedConnex.

## 3 System Configuration

The PedConnex utility is a user friendly program that configures Campbell APS stations. While the station comes configured from the factory, some installations require modifications to audible indications or functionality to best fit the needs of the crosswalk location of concern.

The configuration utility can be downloaded and launched on any number of Windows based computers that will be used in the field (currently Windows 7 with the latest updates and above).

**Downloading PedConnex:** [www.pedsafety.com/downloads](http://www.pedsafety.com/downloads) Run the installer. All drivers will be installed automatically if selected during installation. The FTDI drivers are for the USB connection. The dot NET framework is a Windows driver library and should not need to be installed in most situations, but is included if needed.

**PedConnex Settings:** PedConnex handles settings in 2 different groups.

- **Configuration:** This is the group of settings that includes the mode settings and volume settings. Configurations can be
  - Read from the Station
  - Sent to the Station
- **Profile:** The station Profile includes the Configuration settings plus all the audio files. Profiles can be
  - Read from the Station
  - Sent to the Station
  - Saved to the Computer
  - Loaded from the Computer

In addition, audio files can be individually managed.

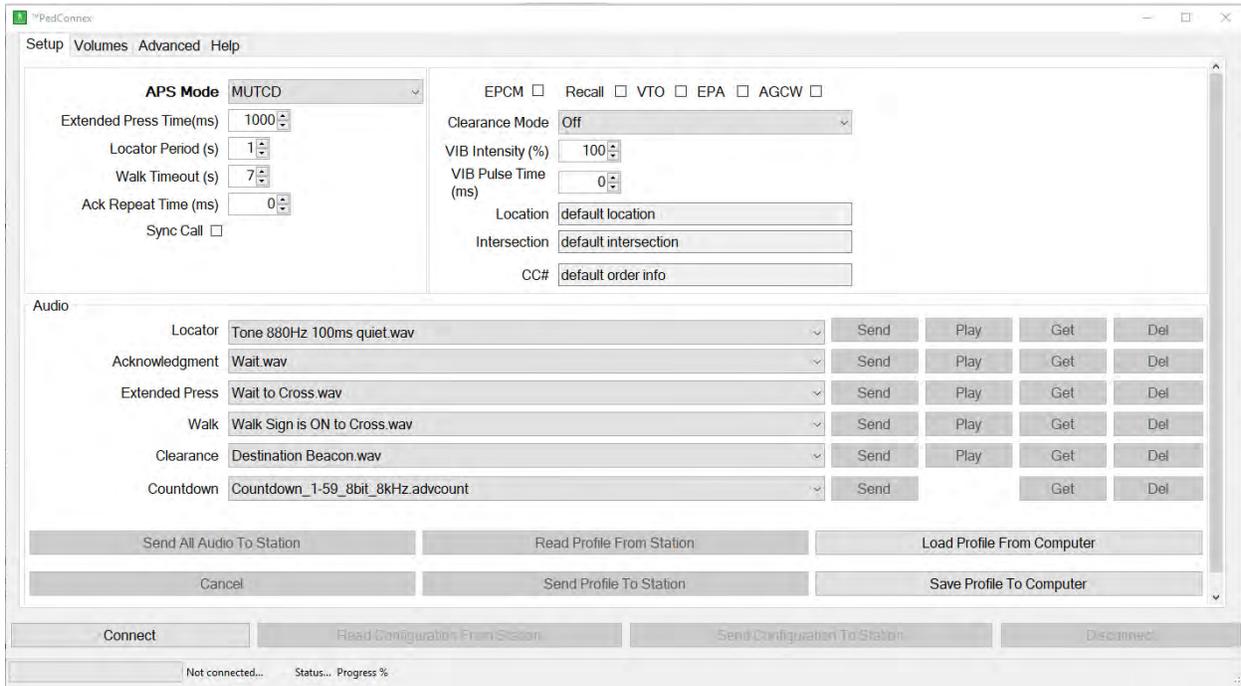
### Connecting to the station:

1. Plug in the USB cable into the port. Click "**Connect**" to connect to the station.
2. To download the settings from the Station, click on the "**Read Configuration from Station**" or the "**Read Profile from Station**" buttons. The settings from the Station are now available in the utility for viewing, modification, or to be saved in a Configuration file (.agps) to be used in other stations.
3. After making any desired changes, click the "**Send Configuration to Station**" or the "**Send Profile to Station**" prior to closing or disconnecting PedConnex for changes to take effect on Station. Once PedConnex is closed all modified values are lost unless they are sent to the station or saved to the computer.

To save the configuration to the PC, click on **“Save Profile to Computer”**. This will save the settings in a .agps file for future use. This is beneficial for modifying multiple stations at different locations without having to reconfigure the utility for each station manually. Numerous Profiles can be saved on the computer for future use. To access a Profile, click on **“Load Profile from Computer”**.

### 3.1 Setup Tab

The setup tab contains the settings necessary to make the device work in the form best suited to the user's particular intersection.



*Figure 1. Setup tab in MUTCD Mode.* For help on any of the utility functions, hover the mouse over the labels or buttons. A bubble will appear with help information.

The top section has the configuration settings and is used to define how the station will function. The **APS Mode** setting is the first item that must be set. Once a mode is chosen, only settings that apply to that mode will be visible. For a description of the configuration settings see the specific APS Mode sections.

The lower section controls the station audio files. Audio file categories that are not applicable to a selected APS Mode will be greyed out, as they are not used in that mode.

The Audio File options available are:

- **Locator:** Repeats a tone to guide the pedestrian to the station.

- **Acknowledgment:** This audio indication plays as soon as the button is pressed.
- **Extended Press:** This audio indication plays if the button is held down to access the location 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. The countdown indication requires one cycle to calibrate timing every time you connect to or reboot the station. This is a special file type (.advcount). See section 5 -Audio Files using PedConnex.

The Audio section of the Setup Tab displays the audio indications that will be active during the various phases of the cycle. There are 4 actions available for these files.

- **“Send”:** Uploads the desired indication or sound onto the station.
- **“Play”:** Plays the file on the station, from the station.
- **“Get”:** Copies the file from the station and places it on the computer.
- **“Del”:** Deletes the file on the station.

The desired files are chosen from the dropdown list. If “No File” is selected then no file will be uploaded when the Send button is clicked. To add a file to the list, click on “Add file to list...”.

To upload all the selected files, click on **“Send All Audio to Station”**.

### 3.1.1 MUTCD Mode

MUTCD Mode is the default APS operation. When idle the station plays a locator tone. A short button press on the station plays an Acknowledgment indication. An extended press plays a Location indication. Any type of press sends a call to the traffic controller. During the Walk cycle, the station plays the Walk indication. Then during the Flashing Don't Walk cycle, the selected Clearance Mode indication will play. Finally, the station goes back to playing the locator tone.

Extended Press Time	Holding the pedestrian push button down for this time will play the location message. Time in milliseconds (1000 ms = 1 sec).
Locator Period	Interval time in seconds between locator audio indication.
Walk Timeout	Maximum time in seconds for walk indication to play. Set to zero for no timeout. FDW will truncate walk audio.
Ack Repeat Time	Time in seconds between repeated acknowledgment indication. Set to zero to disable.

Sync Call	<p>Synchronize outputs of multiple pedestrian stations.</p> <ul style="list-style-type: none"> <li>• <i>Disabled</i> – Acts like an independent station.</li> <li>• <i>Enabled</i> – Will sync with all buttons on a phase.</li> </ul>
Clearance mode	<p>Sets <i>what and how audio files are played in Flashing Don't Walk.</i></p> <ul style="list-style-type: none"> <li>• <i>Off</i> – No FDW audio. Goes back to locating.</li> <li>• <i>Always On</i> – Plays Clearance indication every activated cycle.</li> <li>• <i>Destination Beaconing</i> – Destination station provides target beaconing (Clearance indication) for pedestrian to locate. The station pressed will not play a message.</li> <li>• <i>Countdown</i> – Audible countdown of the clearance phase. Note: Requires one cycle to calibrate Flashing Don't Walk time.</li> </ul>
VIB Intensity	Configures the percentage intensity of the vibrotactile indication.
VIB Pulse Time	Sets the vibration time in milliseconds when the button is pressed.

*Selectable Features*

EPCM	If selected, activates clearance function only after an extended press. This feature can only be used with “Countdown” or “Always On” clearance modes.
Recall	If selected, automatically places a new call at the beginning of clearance interval (walk message will play every time the walk interval is displayed).
VTO	If selected, the station shall vibrate tactile arrow button every time the walk interval is displayed.
EPA	If selected, the audible walk message will only be activated during the walk interval if the button is depressed for the selected period of time. For the walk phase, the volumes can be increased to play at a set level.
AGCW	If selected, enables automatic gain control in walk. For use only with voice audio messages.

*Table 1. MUTCD options*

Sync call, shown in *Figure 2*, activates all stations connected on the same phase. The station's Field Terminals must be wired to the traffic cabinet. When one of the buttons is pressed all the stations on that phase will play the Walk indication on the next Walk cycle. For Sync Call, make sure all stations have “Sync Call” checked on the “Setup” tab.

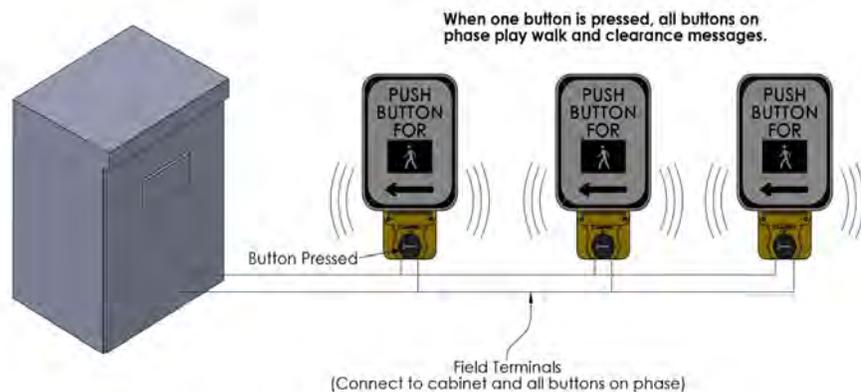


Figure 2. Sync Call Connection and Activation Diagram.

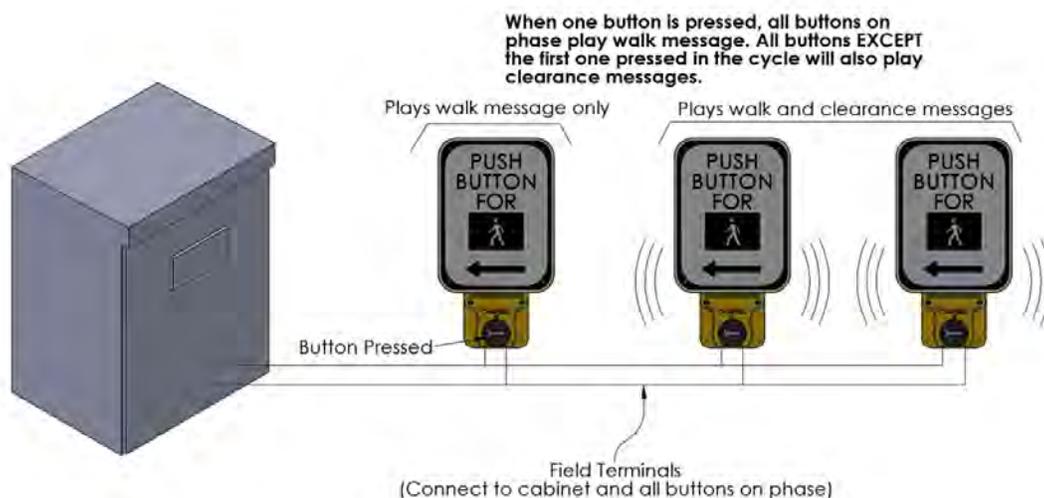


Figure 3. Clearance Mode: Destination Beacon - connection and activation diagram.

For Clearance Mode: Destination Beacon (Figure 3), the stations must be connected together on the same phase with the Field Terminals. All stations must be set with “Destination Beacon” “Clearance Mode” on the “Setup” tab. Then the first button press will activate all stations to play during the next Walk cycle. All stations, *except the station that was pressed*, will play the Clearance message in Flashing Don’t Walk. Destination Beacon only activates on the first button press each cycle.

### 3.1.2 RRFB Mode

RRFB Mode is used specifically for RRFB crossings and other flashers. The default configuration settings and audio files are different than MUTCD mode.

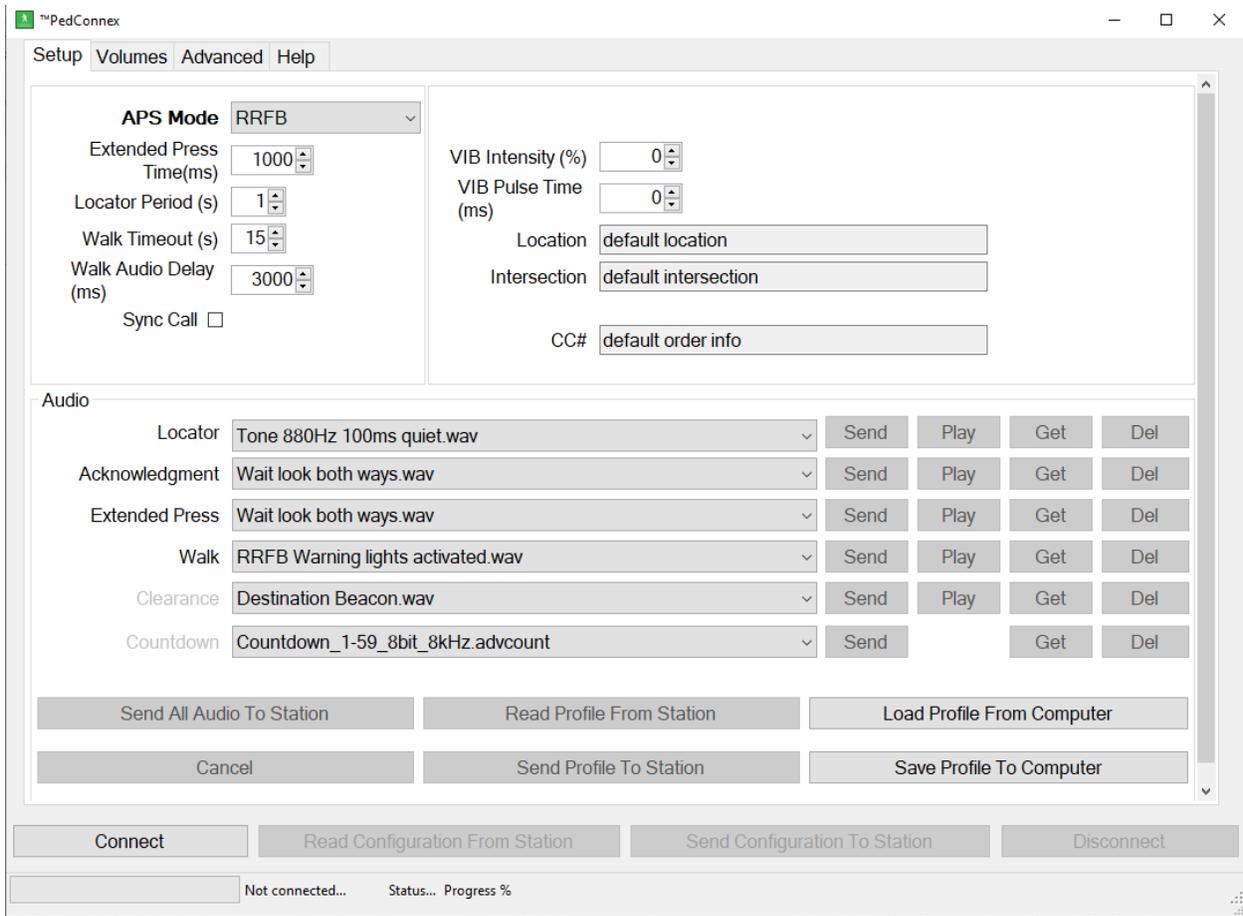


Figure 4: Setup tab in RRFB Mode

Extended Press Time	Holding the pedestrian push button down for this time will play the location message. Time in milliseconds (1000 ms = 1 sec).
Locator Period	Interval time in seconds between locator audio indication.
Walk Timeout	Maximum time in seconds for walk indication to play. Set to zero for no timeout.
Walk Audio Delay	Time delay, in milliseconds, before the Walk indication is played in the Walk cycle.
Sync Call	Synchronize outputs of multiple pedestrian stations. <ul style="list-style-type: none"> <li>• Disabled – Acts like an independent station.</li> <li>• Enabled – Will sync with all buttons on a phase.</li> </ul>
VIB Intensity	Default is 0 (no vibration) per MUTCD requirements
VIB Pulse Time	Sets the vibration time in milliseconds when the button is pressed.

Table 2. RRFB options

### 3.1.3 Beacon Mode

Beacon Mode is used for audible beaoning to help pedestrians cross the street (*Figure 5*). The station waits for an extended button press activation at a remote station connected on the same phase. Once activated, the station will wait for the next Walk cycle, and then play the Walk indication. When Flashing Don't Walk cycle begins it will play the selected Clearance indication or countdown.

*Figure 5* shows the Beacon configuration options, and *Table 3* describes the options.

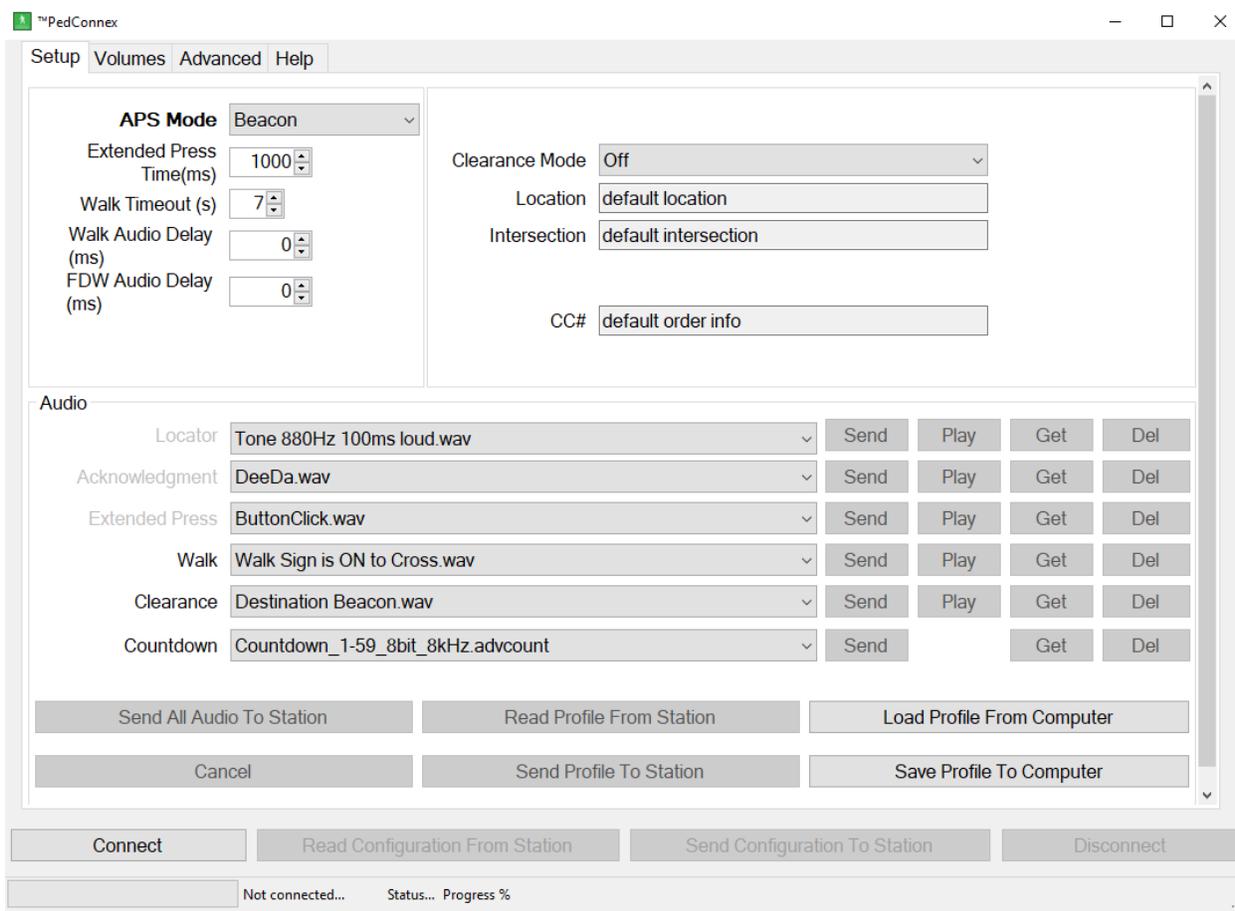


Figure 5. Setup Tab in Beacon Mode

Note in the Audio section on the lower half of *Figure 5*, the top three labels are “greyed out”. This is because in Beacon Mode they are not used.

Extended Press Time	Holding a pedestrian push button down on a remote station on the same phase for this time will activate the Beacon next Walk cycle. Time in milliseconds (1000 ms = 1 sec).
Walk Timeout	Maximum time in seconds for walk indication to play.
Walk Audio Delay	Time delay, in milliseconds, before the Walk indication is played in the Walk cycle.
FDW Audio Delay	Time delay, in milliseconds, before the Clearance indication is played in the Flashing Don't Walk cycle.
Clearance mode	<p><i>Sets what and how audio files are played in Flashing Don't Walk.</i></p> <ul style="list-style-type: none"> <li>• <i>Off</i> – No audio in FDW.</li> <li>• <i>Always On</i> – Plays Clearance indication every activated cycle.</li> <li>• <i>Countdown</i> – Audible countdown of the clearance phase.</li> </ul> <p>Note: Requires one cycle to calibrate Flashing Don't Walk time.</p>

Table 3. Beacon Mode Options

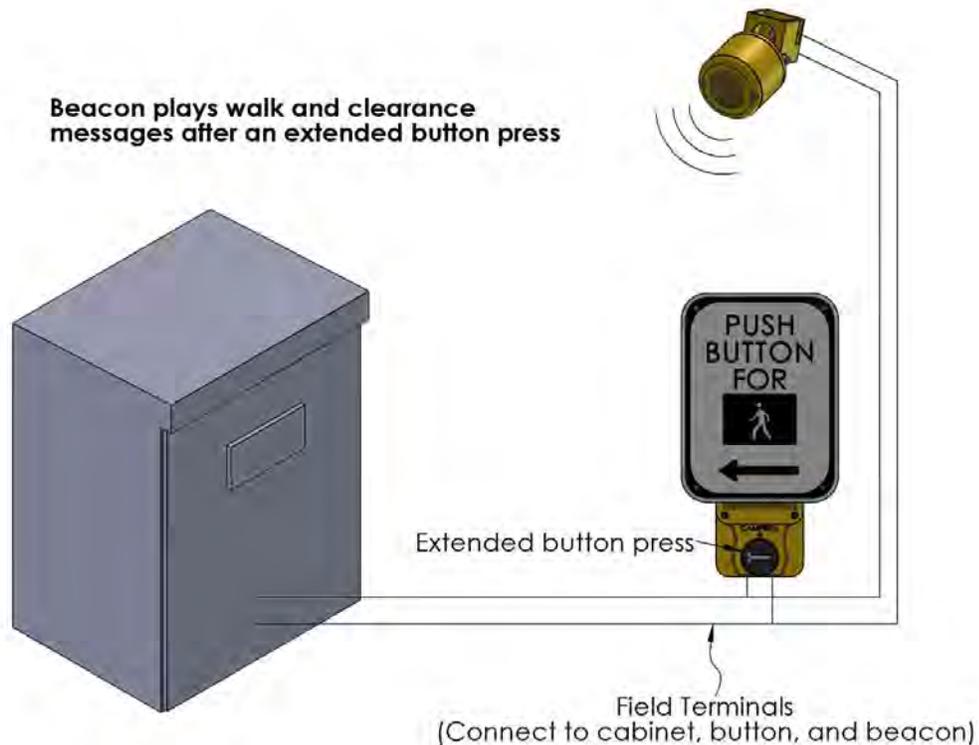


Figure 6. Beacon Connection and Activation Diagram.

### 3.1.4 TAC Mode

TAC (Transportation Association of Canada) Mode provides functionality that is different from MUTCD, primarily that audible features are activated on extended press only.

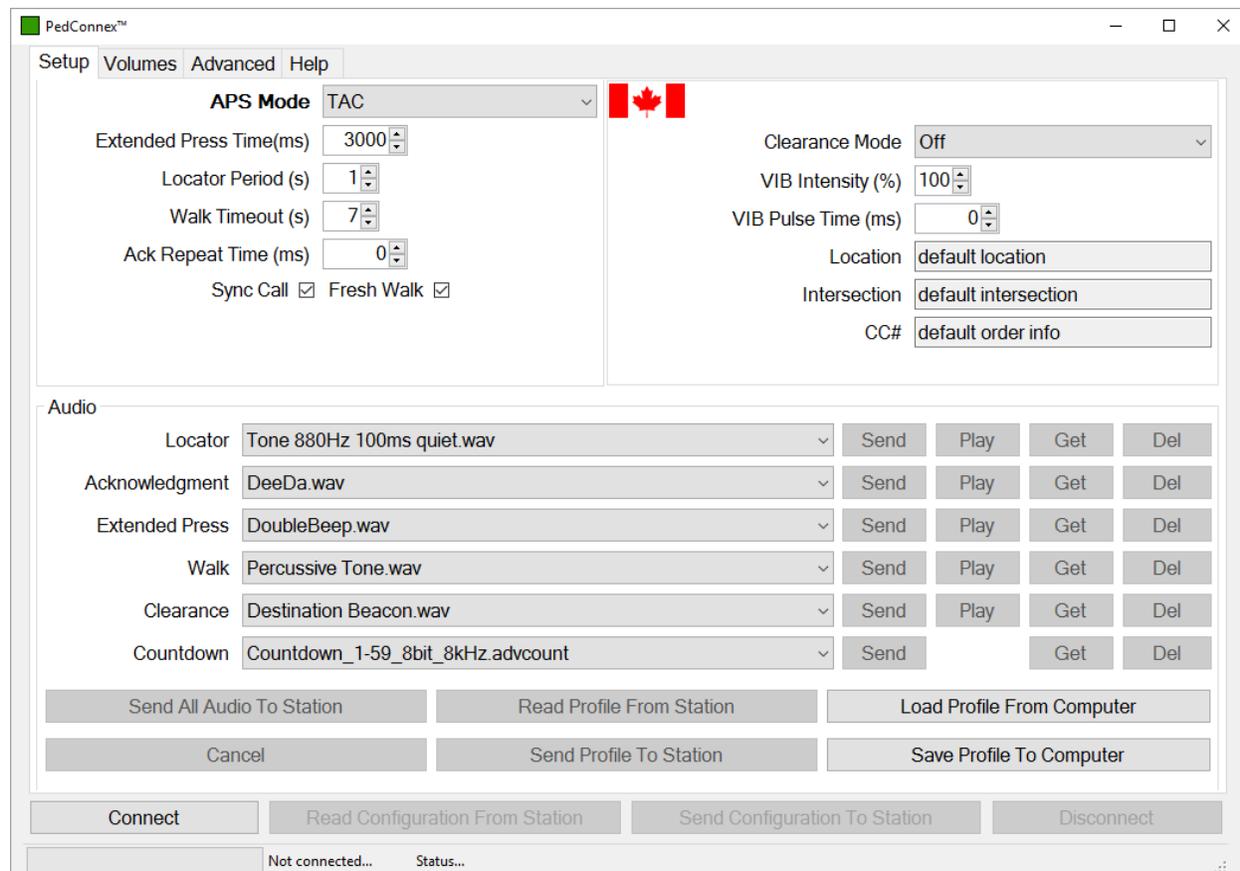


Figure 7. Setup tab in TAC Mode

Extended Press Time	Holding the pedestrian push button down for this time will play the location message and activate the EPAPS functions. Time in milliseconds (1000 ms = 1 sec).
Locator Period	Interval time in seconds between locator audio indication.
Walk Timeout	Maximum time in seconds for walk indication to play. Set to zero for no timeout. FDW will truncate walk audio.
Ack Repeat Time	Time in seconds between repeated acknowledgment indication. Set to zero to disable.
Sync Call	Synchronize outputs of multiple pedestrian stations. See Figure 2 <ul style="list-style-type: none"> <li>• <i>Disabled</i> – Acts like an independent station.</li> <li>• <i>Enabled</i> – Will sync with all buttons on a phase.</li> </ul>

Fresh Walk	Fresh Walk ensures a full walk cycle for the pedestrian. If Fresh Walk is enabled, and the button is pressed during a walk cycle, the call will be held until the Flashing Don't Walk cycle, and the walk audio indication will not be played until the next walk cycle.
Clearance mode	<p>Sets <i>what and how</i> audio files are played in <i>Flashing Don't Walk</i>.</p> <ul style="list-style-type: none"> <li>• <i>Off</i> – No FDW audio. Goes back to locator tone.</li> <li>• <i>Always On</i> – Plays Clearance indication every activated cycle.</li> <li>• <i>Countdown</i> – Audible countdown of the clearance phase.</li> </ul> <p>Note: Requires one cycle to calibrate Flashing Don't Walk time.</p>
VIB Intensity	Configures the percentage intensity of the vibrotactile indication.
VIB Pulse Time	Sets the vibration time in milliseconds that will occur for an extended press of the button

Table 4. TAC options

### 3.1.5 Off Mode

Off mode is designed to work in two different ways:

1. With an acknowledgment audio file on the station, when the button is pressed
  - The acknowledgment file plays (“DeeDa” is default)
  - The LED turns on
  - The button will not vibrate
  - The LED will turn off at the start of the walk cycle
  
2. With no acknowledgement audio file, when the button is pressed
  - a. No acknowledgment audio will be played
  - b. The LED turns on
  - c. The button will not vibrate
  - d. The LED will turn off at the start of the walk cycle

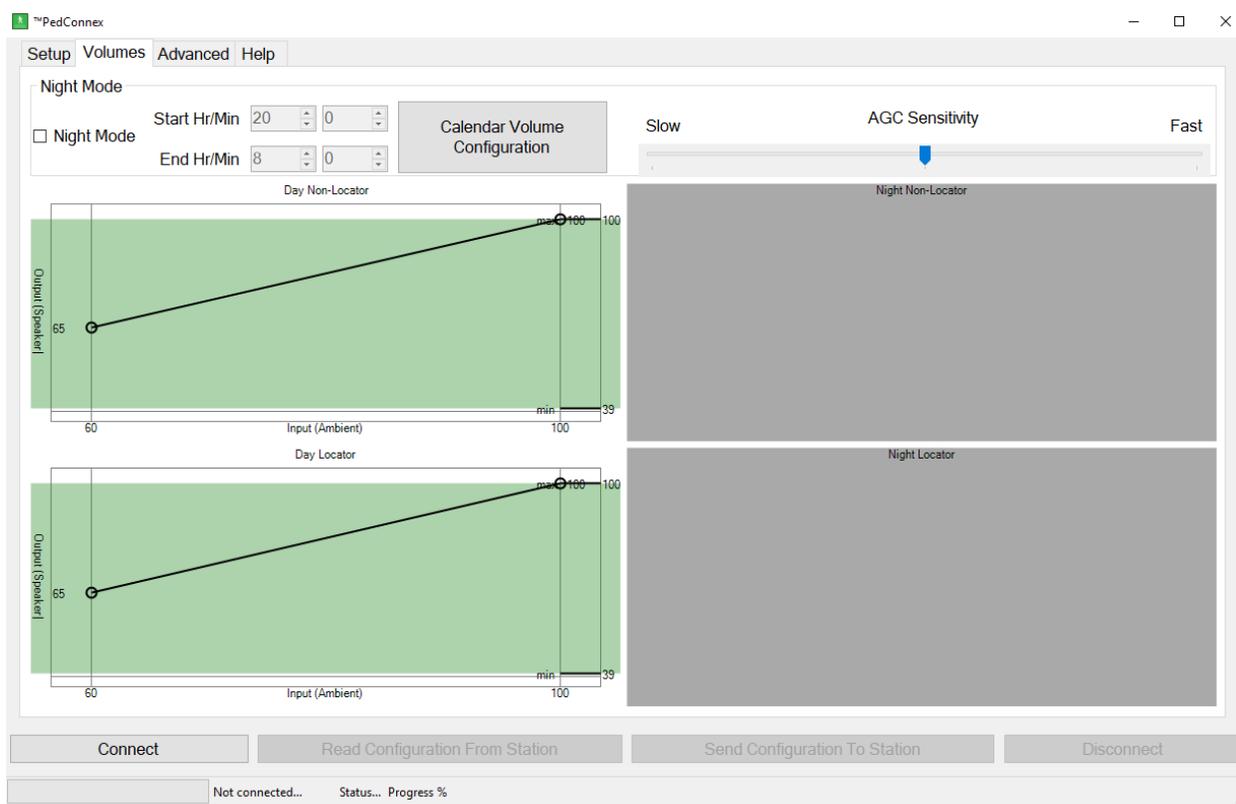
Note: be sure to use the “Send Profile to Station” command to send the default audio files. If the “Send Configuration to Station” is used, any audio files currently on the station will remain, and Off mode will not function correctly.

### 3.1.6 Test Mode

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

## 3.2 Volumes Tab

The volume control is graphical. Each volume control has four parameters: left bubble, right bubble, min, and max. The left bubble sets the volume that will play at low noise levels. The right bubble sets the volume that will play at high noise levels. No volume will play below the min setting or above the max setting. In effect, the left/right bubbles set the min/max volumes and the rate of volume increase to the noise level, while the min and max settings provide a hard cutoff. For example, if you want a really quiet station at low noise and a fast increase in volume compared to the noise level, the left bubble will be set low (40) and the right bubble high (105). Then when the volume at high noise levels is too loud the max setting can be lowered (80) to keep the station from playing over that volume.



*Figure 8. Volumes Tab with Night Mode off*

Figure 8 shows the Volumes tab with Night Mode Disabled. The daytime has two volume controls. The Day Locator only sets the volume for the locator tone, while the Day Non-Locator controls volumes for all other audio indications. Figure 9 shows the Volumes tab with Night Mode Enabled. Night mode lets you set different volumes for night and day operation. It adds two more volume controls just like the daytime controls and operates the same. The time when night mode starts and ends is set under Night Mode. The time is set to 24-hour format. Remember to set the station time correctly or night mode will run at the wrong time.

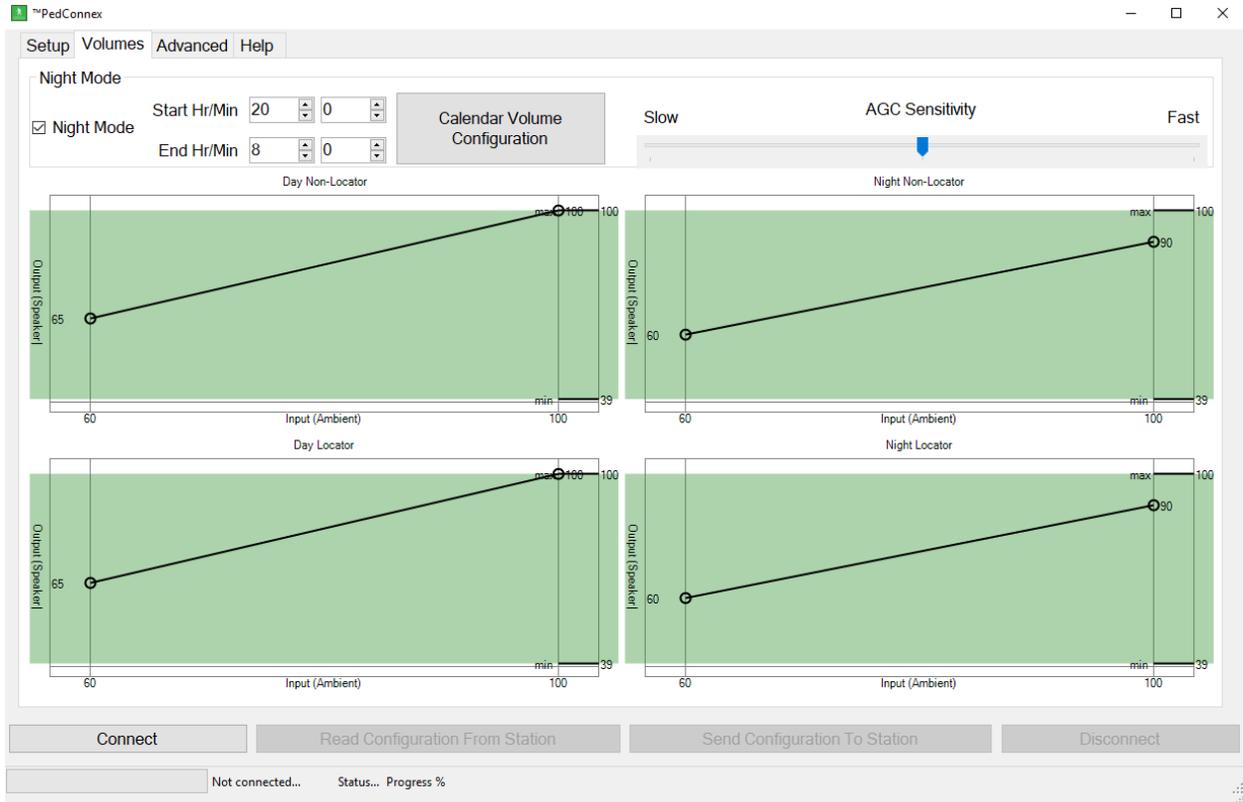


Figure 9. Volumes Tab with Night Mode on

In addition to setting the volume, the user can adjust Audible Gain Control Sensitivity, which will change how quickly the station reacts to noise changes. The sensitivity can be set to Slow, Medium, or Fast.

Figure 10 shows the calendar functionality volume control. Calendar functionality lets you set different volumes for selected time slices on different days of the week. For example, if you want the APS to have lower volume from 8 PM – 8 AM on weekdays, select the checkboxes for all of the weekdays, change the start time to 20 hours, change the end time to 8 hours, and input the desired volumes for the selected time period. The “Low”, “Medium”, “High”, and “Off” checkboxes in the lower left corner, are preset volume inputs that will adjust all volumes to predetermined factory settings for low, medium, high, or zero volume. The time is set to 24-hour format. Remember to set the station time correctly or the calendar function will run at the wrong time.

The screenshot shows a software window titled "CalendarVolumes" with the PedConnex logo. Below the logo is a "VolumeControl" section containing a table for configuring volume settings by day and time.

	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 10. Calendar Functionality

### 3.3 Advanced Tab

The Advanced tab has several advanced features and administrative options.

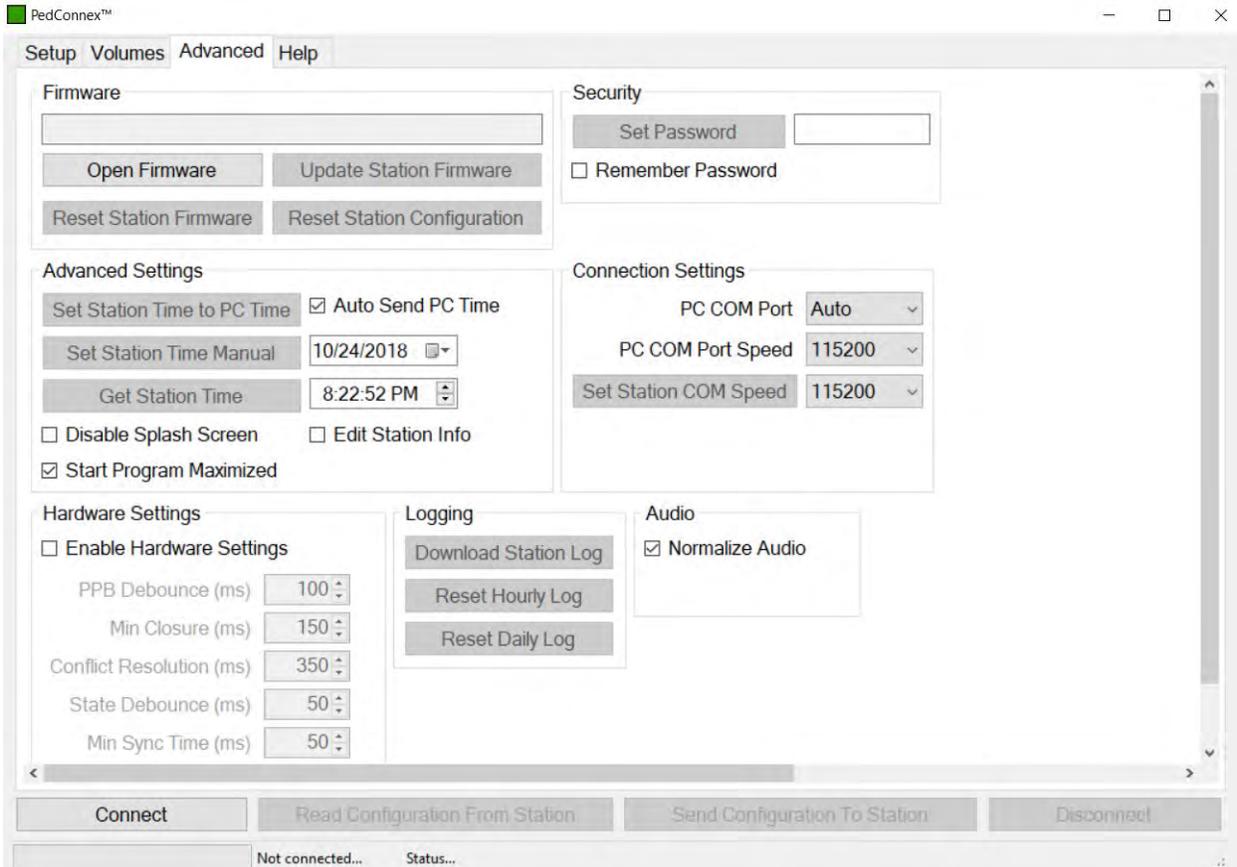


Figure 11. Advanced Tab

#### Firmware:

- **Open Firmware:** Opens the binary file when upgrading the firmware (must be a .bin file).
- **Update Station Firmware:** Applies the opened firmware update to the station.
- **Reset Station Firmware:** Resets the station firmware to factory default firmware. This does not affect the audio files, station time, volumes, or configuration settings.
- **Reset Station Configuration:** Restores station to default configuration and volume settings. This does not affect audio files or station time.

#### Advanced Settings:

- **Set Station Time to PC Time:** This applies the PC clock time to the station clock time.
- **Auto Send PC Time:** Checking this box sets the station clock to the controlling PC's clock time when "Save To Station" button is clicked. The default setting is checked.
- **Set Station Time Manually:** Set the desired date and time on the tab and click this button to set the station time.

- Get Station time: Reads date and time from station.
- DST: Automatically adjusts station time according to daylight savings changes.
- Edit Station Info: Click this to be able to change location, intersection, or CC# of the station on the Setup Tab.
- Disable Splash Screen: If checked don't show the startup splash screen when the utility starts.

**Security:**

- Set Password: Allows the user to change or create a password. See Section 4 of this manual for instructions.

**Connection Settings:**

- PC COM Port: Allows the user to choose the PC COM port to connect to. Auto will auto detect the correct COM port if only one station is attached. Only used when connecting to station.
- PC COM Port Speed: Changes the Baud rate (bits/second) of the PC COM port. Only used when connecting to station. May need to set lower speed if station has trouble connecting.
- Set Station COM Speed: Changes the Baud rate (bits/second) of the station USB connection. Can only change when station is connected, but doesn't take effect until next station connection. Normally not necessary.

## 4 Setting a Password for the Station

PedConnex allows you to set a password to restrict access to configure the station. Note that once a password is set, it must be entered before reconnecting to the station. If Remember Password is not checked the password box will clear after every use of Set Password. If the password is forgotten, the station will need to be returned to the factory to be reset.

### Steps to set password:

1. Connect to the Station
2. Click on the Advanced Tab
3. Enter a password for the station. Use alpha-numeric characters only. Valid characters are a-z, A-Z, and 0-9. No punctuation or symbols are allowed. Passwords are case sensitive.
4. (optional) Check the "Remember Password" checkbox to have PedConnex remember the password.
5. Click on "Set Password"

Note: only one password can be saved.

### Steps to clear password:

1. Connect to the Station
2. Click on the Advanced Tab
3. Clear the password for the station.
4. Click on "Set Password"

Note: If the station does not have a password set, PedConnex will connect to the station with or without a password being entered.

**Warning:** Once a password has been set for a station, that password will need to be entered before using PedConnex to change any additional settings. If the password is forgotten, the station will need to be returned to the factory to be reset.

## 5 Audio Files using PedConnex

The station comes fully programmed with audio files from the factory. Campbell Company generates custom messages for the intersection from information on the intersection worksheet submitted at the time of order placement. In addition, a full audio library is available at Campbell Company should different files be needed. Campbell Company provides English and Spanish messages, male or female voices, and an array of tones for your required specification.

Campbell Company uses a WAVE (.wav) file format for its audio indication. PedConnex needs WAVE files in 16-bit signed PCM, 16kHz audio sample rates, and mono channel.

Note: The sum of all custom audio files used should not exceed 50 seconds.

Free audio and recording programs, Audacity® is an example, are available on the web. A studio quality USB microphone and an area that is isolated from external noise is beneficial to recording quality messages.

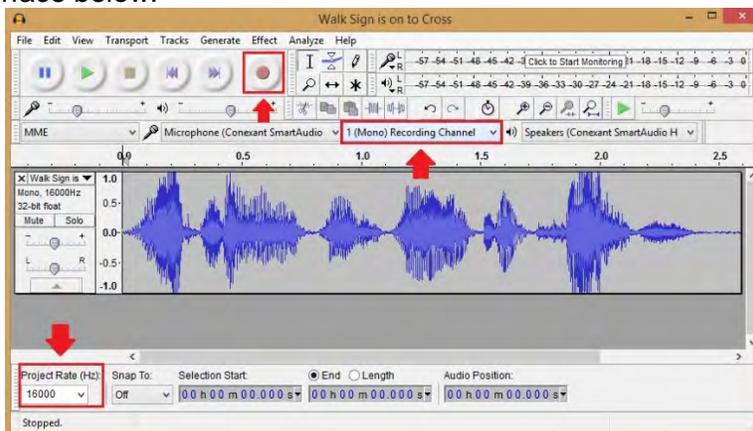
Audio files are easily transferred using PedConnex. On the Setup tab click on the appropriate dropdown box and select “Add file to list...” and a dialog box will open. Find and select your audio file and select Open. The audio file will now be selectable on the audio list. Connect to the station and then click “Send” on the correct audio file slot.

The countdown file (.advcount) is the exception. It is a special file format and cannot be created using third party software.

### Recording Custom .wav 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. See interface below:



## 6 Appendix A: Acronyms, Abbreviations & Definitions

Term	Meaning
Accessible Pedestrian Signal (APS)	A device that communicates information about pedestrian signal in a non-visual format such as audible tones, verbal messages, and/or vibrating surfaces (MUTCD).
Audio File	Must be in WAVE (.wav) file format. (16-bit signed, 16kHz, mono)
Automatic Gain Control (AGC)	An APS volume control that is automatically responsive to ambient (background) sound.
Base Station	Fully integrated APS station that contains the micro-controller, push button, speaker, and adapter plate.
CC#	Campbell Company Sales Order Number.
Clearance Interval Indication	Tones sounding during the pedestrian clearance interval that are differentiated from the WALK interval indicator (tones).
Clearance Interval	Flashing Don't Walk (FDW) pedestrian cycle.
COM Port	Communication port
Destination Beaconsing	Destination station provides target beaconsing for pedestrian to locate. The station must be connected to another station (same phase) to have the destination beaconsing tone play in the clearance phase.
EPAPS	A TAC APS mode where audio acknowledgment, walk, and clearance messages are only played after an Extended Press
Fresh Walk	A TAC mode which ensures a full walk cycle for the pedestrian.
Intersection	Cross streets for reference
Location	City, State
Signal Power Interface (SPI)	Power source that interfaces with Pedestrian Signal Head power for Base Station interface.

USB Port	USB connection on Campbell Company stations.
Vib Call Pulse	Vibro-tactile haptic feedback at push button when depressed.
Volume	Two settings adjust volume for non-locator indications and locator tone independently
.agps file	Campbell Company configuration settings file.
.advcount file	Campbell Company countdown audio file.
.bin file	Binary station firmware file.
.wav file	An audio file format.