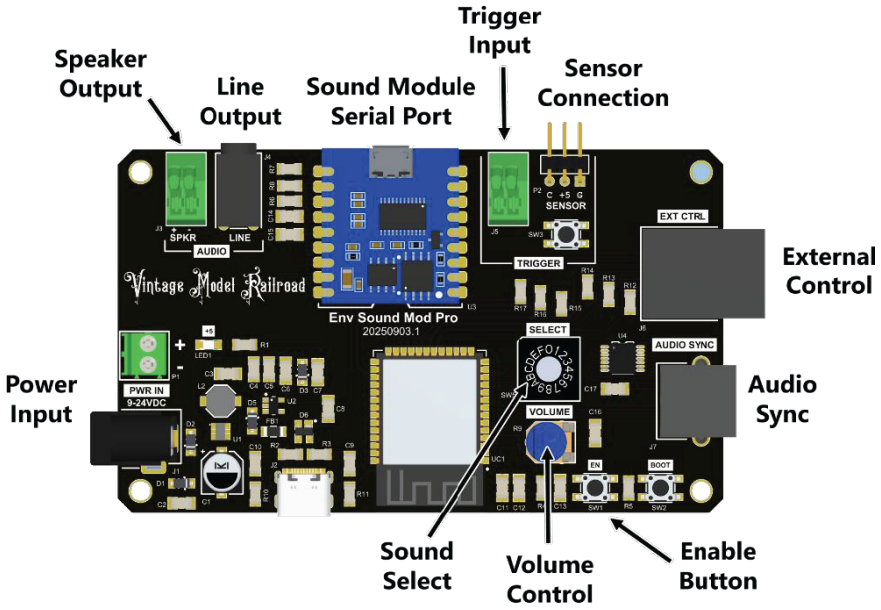
Environmental Sound Module Pro

The Environment Sound Module Pro (ESMPro) is used to enhance the experience of your model railroad layout by introducing a variety of sound options.



Features:

Power

The ESMPro is powered by 924VDC. Power can be connected by either the screw terminal block or the power input jack. Note the polarity when using the terminal block. Connecting power incorrectly may result in damage to the ESMPro.

Audio Outputs

The ESMPro provides up to 5W of audio power to a 48Ω speaker connected to the speaker terminals. When using the speaker connection, the right and left stereo channels are combined into a mono signal.

The ESMPro provides a stereo line output through a standard 1/8" audio jack. This source can be used to drive an additional amplifier or headphones.

Sound Module Serial Input Port

This USBB connection is used to upload custom audio files to the ESMPro.

Trigger Connections

Sound is played when the ESMPro receives a trigger signal. Trigger signals are received when the trigger button is pressed, the two terminals of the terminal block are connected together, or an external sensor has been activated. The sound is played for as long as the trigger signal is present.

External Control

The ESMPro can be controlled by an external ESMProSW accessory. This provides the user with an additional method for selecting and triggering sound events. This connection can also be used to control the ESMPro with an Arduino, Raspberry Pi, or other device. Details of this operation are provided in other documentation.

Audio Synchronization

External lighting can be synchronized with the audio from the ESMPro through the Audio Sync connection. Examples of this feature are the synchronization of lightning to the sounds of thunder, the crackle of a campfire, or the sounds of welding. An external Audio Sync board is

Enable Button

This button is used to restart the ESMPro.

Volume Control

This controls the sound level to the speaker and the audio line outputs.

Sound Select

This switch selects which of the sixteen stored sound files is to be played when a trigger signal is received.

Operation:

Audio Output Connection

Start by connecting the desired audio output device. Connect a 48Ω speaker to the terminal block. This is a mono signal that combines the right and left channel if the source file is stereo. An external stereo or mono audio amplifier can be connected using a standard 1/8" audio jack.

Volume Control

When first using the ESMPro, set the volume to maximum to ensure that the unit is working. The volume can be adjusted at any time, whether a sound is playing or not.

Power

Apply 924VDC to the ESMPro. Input power can be connected to the terminal block. This is useful if you are using track voltage or other power source that is close to where the ESMPro is located.

CAUTION: Be sure to connect power to the terminal block correctly. Incorrect connection can result in damage to the ESMPro.

The ESMPro can also be powered by an AC/DC wall adapter.

The ESMPro will begin operation once power is applied. This is indicated by the playing of an identifying audio file. If this sound is not heard, momentarily press the Enable button.

Sound Selection

Use the rotary switch to select which of the sixteen files is to be played when a trigger signal is received by the ESMPro.

Triggering the Playing of a Sound File

The file selected by the Sound Select switch is played when a trigger signal is received. The sound plays and is repeated for as long as the trigger signal is present.

Button Press

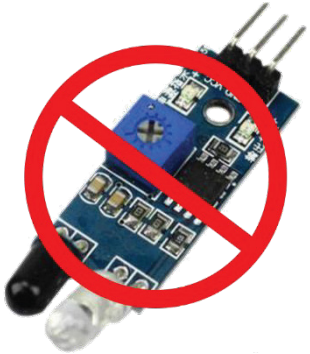
A trigger signal is generated when the Trigger Button is pressed. This is especially useful when testing sound files or when setting the desired volume.

Contact Closure

A trigger signal can be generated externally by connecting a switch, relay, or other contact closure to the Trigger Terminal Block. This is a nonpowered connection. Do not connect any power or ground signals to these inputs.

Sensor Trigger

A trigger signal can be generated by an externally connected sensor device. The sensor is connected to the ESMPro using a standard R/C servo wires.



CAUTION: Do not use sensors such as the one shown here. The wiring of the sensor pins is NOT compatible with the pins on the ESMPro. Damage to the sensor and/or the

ESMPro may result if this type of sensor is used without reordering the connections.

Compatible VMRR sensors are available.

Custom Sound Files

Users may replace the default sound files with custom sounds. Files must be in MP3 format. Up to sixteen files can be loaded onto the ESMPro. It is not necessary that the files be the same size, but the total size of all the files must be less than 4MB.

Files may be stereo or mono. If only the speaker is being used, it is recommended that the sound files be mono. Mono files are smaller than stereo files.

If typical speakers or other audio devices are being used, high fidelity quality is not necessary. Use low fidelity files appropriate for your application.

To upload your files, connect a mini USBB cable between your computer and the ESMPro Serial Port. This will create a USB disc drive on your computer. Use your file manager to upload your files to the ESMPro.

NOTE: File naming is very important. Improperly named files will not play. Files must be named in the following format:

000X.mp3

Where "X" is the file identifier. This identifier is the same as the positions on the Sound Selector switch. Therefore, the sound identifier must be 09 or AF.

For example, file 000E.mp3 will play when a trigger signal is received