

# User Guide for the Silence Sense-A.C. Silence Sense Detector with Both Relay Contacts and Switched 120VAC Outputs

Version 1.0



DM Engineering  
2174 Chandler St.  
Camarillo, CA 93010  
805-987-7881 800-249-0487  
[www.DMEngineering.com](http://www.DMEngineering.com)

## Theory of Operation

The Silence Sense A.C. is a microprocessor-based device that senses the presence of audio from a single ended input over a wide range of input levels. A user adjustable input level control and a green LED indicator are used to set the input sensitivity. When the audio input ceases for a predetermined user selectable period, (approximately 6 seconds to 4 min. maximum timeout), a set of relay contacts are activated. These contacts may be momentary or constant, depending on the front panel switch selection. An internal jumper may be moved to change the relay output to either normally closed or normally open contacts. (The SS-A.C. is shipped with N.O. contacts set by default.) A red LED indicator signals when the preset time period has been exceeded, and the relay is activated. At the same time, 120VAC is applied to the NEMA "U" ground connector on the rear panel. The relay contacts activate for 1 second if the front panel switch is in the pulse position, or remains energized if the switch is in the constant position, and the Solid State Relay will remain on until audio is firmly re-established. The AC output is not subject to the pulse switch selection that controls the relay contacts. The re-application of audio automatically resets the unit.

Power for the SS-A.C. is supplied by the incoming 120VAC line. Battery back-up (9V alkaline) is provided to assure operation of the silence sense circuitry and the relay output if the AC power fails. Silence sense detection, and solid state relay activation are disabled as well as battery back-up power when the front panel power switch is in the off position. A set of input terminals are provided to remotely activate the solid state relay, even when the power switch is off, from normally open contacts, such as a remote control or switch, as long as AC input power is available to the unit.

### A. Connections

1. Audio input...A single ended audio source is attached to the Eurostyle style connector "Audio In" and "Ground" terminals.
2. Relay output...Eurostyle type screw terminals, "Relay Out", rated at 30 VDC at 2 A. (Supplied in the normally open configuration, and a normally closed selection is available. See Fig. 1 in section 3 of Setup.)
3. SSR Remote...A normally open set of contacts connected to the "SSR Remote" and "Ground" terminals will activate the solid state relay as long as there is 120VAC available from the line, and will remain on until the remote contacts open.
4. Power input...Plug the unit into a convenient 120VAC outlet.
5. Battery back-up...Remove the Cabinet cover by removing the two screws on the bottom.
6. **WARNING: Make sure the device is unplugged from the 120VAC source before opening the enclosure to avoid the possibility of a serious shock hazard.** Locate the battery that was shipped with the unit and snap the battery in the battery compartment. Be sure to observe the polarity as

marked inside the battery compartment. Only Alkaline or Lithium type batteries are recommended. Carefully replace the cover.

## B. Setup

1. With audio present at the input, set the power switch to the "ON" position. Note that the unit is shipped in the maximum audio sensitivity setting. Slowly adjust the multi-turn "Audio Gain" control in the counter-clockwise direction until the green LED flashes at low audio passages. Depending on your programming, this level may need to be readjusted for reliable audio detection later.
2. Adjust the multi-turn "Time Delay" set control clock-wise to the desired timeout period. The control is set to the minimum time delay by default. Fully counter-clockwise is approximately 6 seconds, mid-setting is about 2 min, and fully clockwise is approximately 4 min. You may set the control to any position desired. The red LED will signify when the timeout period has been reached and both the relay contacts and solid state relay will be activated.
3. To change the relay contacts to Normally Closed, open the cabinet as instructed in step A-5 and move the "JP1" jumper from the NO position to the NC position. See figure 1 below.



Fig. 1

4. Select momentary "Pulse" or constant "Const" relay operation using the relay output selector switch. See figure 2 below.



Fig. 2

### **C. Operation and test**

To test the Silence Sense AC, plug it into a wall outlet, connect an AC load such as a lamp or piece of equipment (5A. max) and turn the "Power" switch on. Apply audio input so that the green LED is flashing. Remove the audio input and wait for the red LED and both of the relays to activate. This will be the actual delay time, and may be reset at will. Momentarily remove audio to reset the microprocessor each time this adjustment is changed. To test the battery back-up operation, simply disconnect the external power. The Silence Sense AC should continue to function normally except for the solid state relay portion, of course. That's it... the Silence Sense AC is now ready and waiting to monitor your audio.

### **D. Hints**

1. Most programming has pauses from time to time that may last for 30 seconds or more, especially if you are broadcasting Sunday morning church services. Experience has taught that 45-60 seconds is the best selection if you don't want to receive false alarms. Also, take time in setting the input levels. Wait and watch the green LED through different types of programming or selections of music and speech to assure that the sensitivity is set correctly.
2. It is advisable to replace the 9 volt back-up battery annually (if used) if there are few short audio outages, or more frequently if many or long outages are experienced. Use only Alkaline or Lithium to avoid leakage and resultant corrosion issues.

### **E. Specifications**

- Audio input: Single ended audio
- Audio Input Impedance: 10K ohms minimum
- Audio Input Level: -30 to +10 dbm, user adjustable
- Silence Detect Time: 6 seconds to 4 min. (approx.), user adjustable
- Relay Output: normally open single pole relay contacts, 30 VDC@ 2 A. rating, 1 second momentary pulse or constant closure, switch selectable
  - Remote SSR activation: Normally open relay contacts
- AC Input: Line cord, 6 ft. NEMA 3 wire "U" Ground plug, 105-125VAC
- AC Output: NEMA "U Ground" female output connector.
- Solid State Relay specifications: 85-230 VAC input, 5A load capability.
- Silence Sense-AC Power Requirements: 105-125 VAC, 60 Hz
- Battery Back-up Recommendation: 9 VDC alkaline battery, NEDA 1604A (supplied)
- Size: 5.5 x 5.0 x 1.75 not including AC Cord
- Shipping Weight: Approximately 2 lbs.