# SymNet: Debounce a Switch Connected to a SymNet Analog Control Input

All SymNet DSP units are equipped with analog control inputs. These inputs can be utilized in various ways to provide control or trigger events.

## Common uses include:

1. Emergency muting via fire alarm relay.
2. Volume control via 10k pot.
3. Source select or preset recall via multi-position switch.

Option number 3 can present a problem called “contact bounce”.

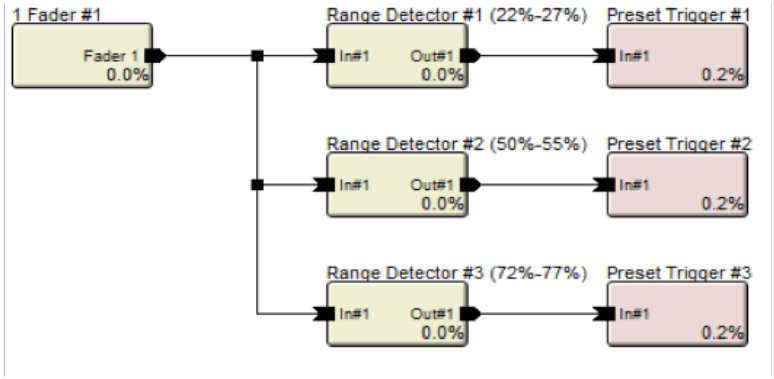
Contact bounce (also called chatter) is a common problem with mechanical switches and relays. Switch and relay contacts are usually made of springy metals that are forced into contact by an actuator. When the contacts strike together, their momentum and elasticity act together to cause bounce. The result is a rapidly pulsed electric current instead of a clean transition from zero to full current. The effect is usually not important in power circuits, but causes problems in some analog and logic circuits that respond fast enough to misinterpret the on-off pulses as a data stream.

## On a SymNet DSP the scenario might be as follows:

A multi-position switch is connected to an analog control input across V+ and IN with a resistor inline with the IN. This allows the switch to have 3 states rather than just 2.

In software this analog control signal is assigned to a control fader that outputs to three range detectors that are set to the three levels that the switch outputs. The output of the range detector could be assigned to a control directly or used to trigger presets.

The following configuration would be the logical solution.




The problem occurs when making a selection on the multi-position switch, for a brief moment the voltage may bounce to 0% or 100%, causing the other presets in between the desired setting and the bounce to trigger unexpectedly.

**NOTE:** Whether the bounce will go to 0% or 100% may vary from one model of switch to another.

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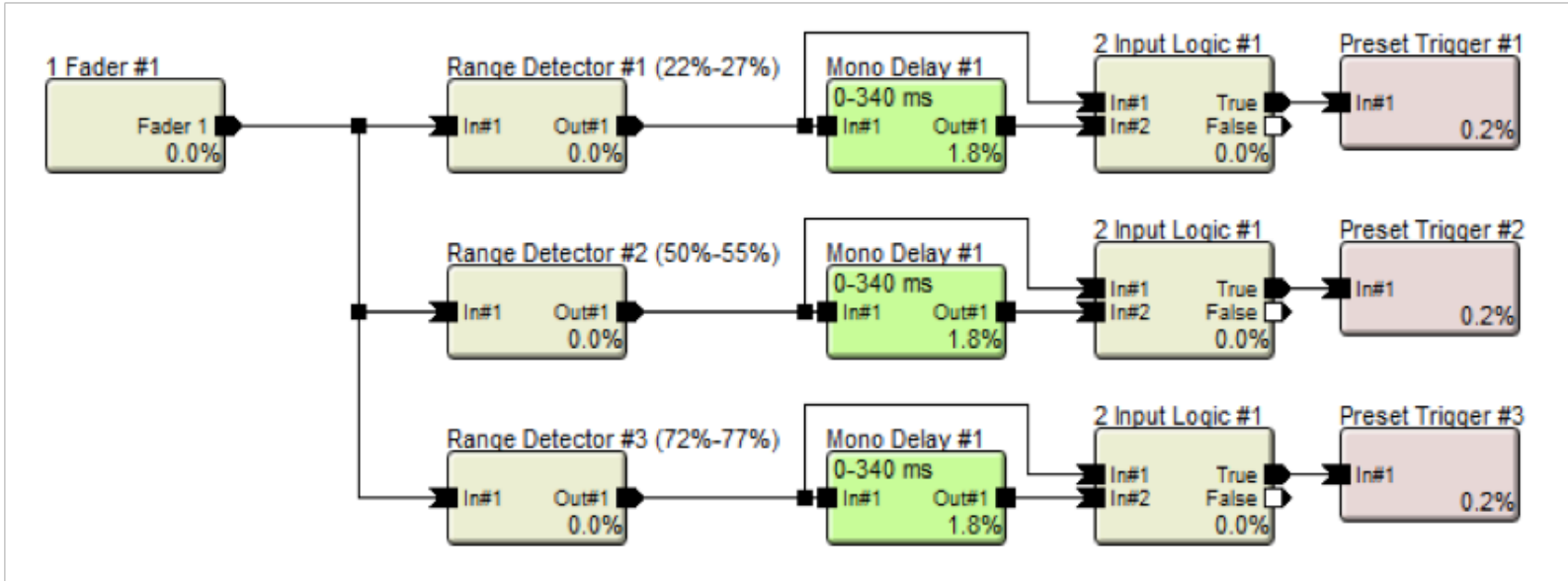
To fix this problem we need to add a time delay so that the contact bounce has settled before the contact input is used.

Here is the configuration with the added time delay and logic.




The delay time sets how long the control signal must be settled and consistent before triggering the preset. A default setting of 100 ms is suggested. As long as the switch bounce settles before 100 ms, the bounce will not register and trigger unintended presets.

**NOTE:** The 2 input logic module must be set to “AND”. This is a solution where control and audio modules are mixed on purpose. Ignore any warnings from the analyzer which may indicate this configuration.

For additional information on this topic, contact Symetrix techical support at **support@symetrix.co**.