How To Create A Latching Button In Pathfinder

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Pathfinder Version:
All versions that support stacking events. Tested specifically on ver. 4.19.

Overview

Latching buttons require specific steps and the use of memory slots. Setting them up is not too difficult; however it is not something you can simply figure out "on the fly".

With any latching switch, there are two switch states: ON and OFF. In addition there are two states for the button - PRESSED or NOT PRESSED (call these UP or DOWN for simplicity). Our stacking event logic must sort this out in order to provide latching control. Three stack events are required. There are many variations that may involve GPIO, mini panels and user panels however the general process is described below.

Stacking Event A
- will run if switch state is OFF and button is DOWN and memory is BLANK
- actions will write a memory value, perform action A and set switch state to ON

Stacking Event B
- will run if switch state is ON and button is DOWN and memory is BLANK
- actions will write a memory value, perform action B and set switch state to OFF

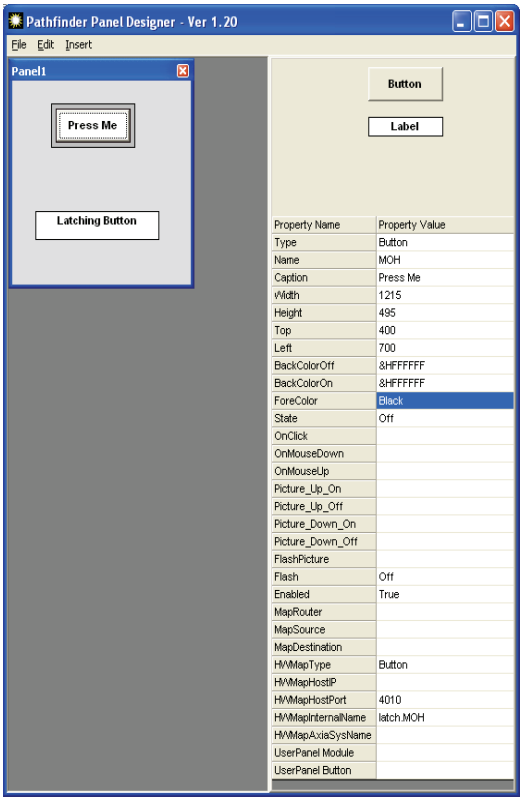
Stacking Event C
- runs if button is UP
- action clears memory

In this example, we will use a simple latching mini panel button to change an audio route and a GPO.

Remember, these same principles apply whether you have a hardware or software button, or even a couple of GPI's that you want to use to create a latching state.

Detailed Example

Now, let's get to a specific example. Let's control an audio route and a GPO with a mini panel latching switch and let's have the background color of the switch indicate the on-off status. In the real world, we might use a switch like this to control the audio feed delivered to our "music on hold" for our office phone switch or to change the feed to a recording device.



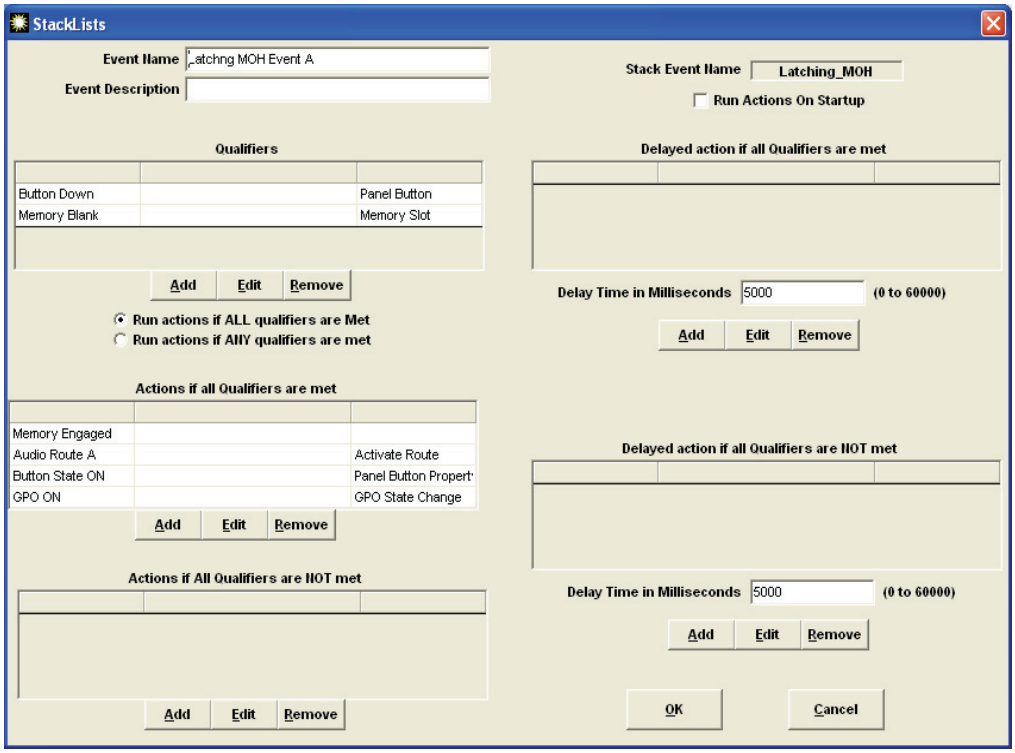
First, create a mini panel with a button. In this example, our panel is named LATCH and our button is named MOH.

Note that all we really need to define is the button itself, and give it a name. The button colors and button state will be defined as actions in the stacking events.

Now we will setup the three stack events that we need to make this behave as a latching button and to perform the desired actions.

IMPORTANT NOTE: The sequence order of the actions is very important. The memory value must be set first. Otherwise as soon as the route change in Stack A happens, stack event B's qualifiers are met and we will find ourselves in a loop.

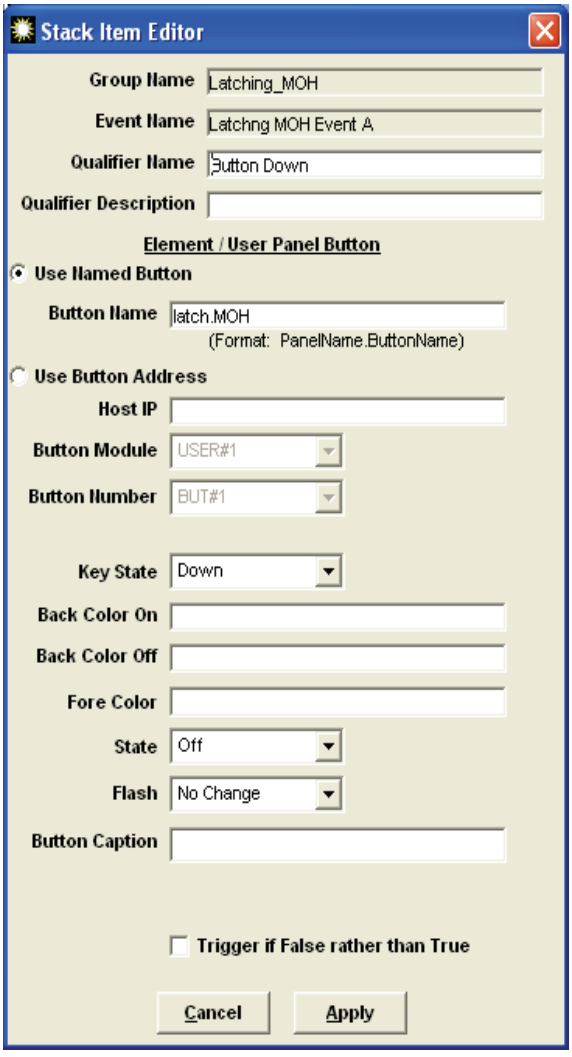
Stacking Event A will run if the latching button state is OFF and it looks like this:

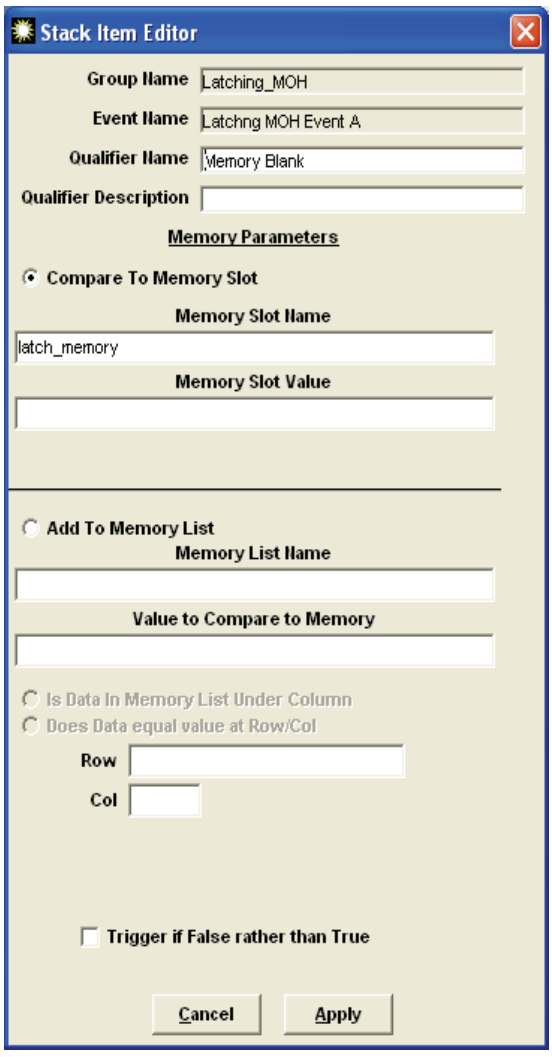


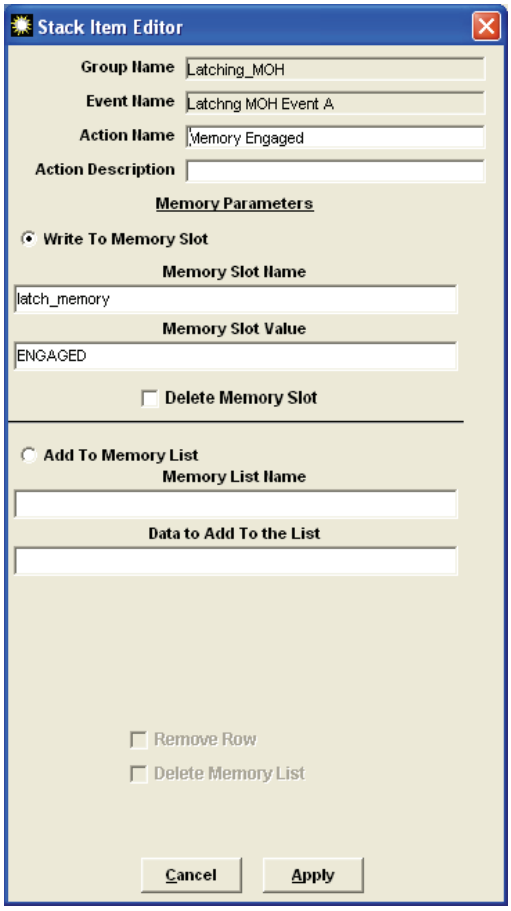
In this case, the Stacking Event has two qualifiers. The first one will determine whether or not the button is pressed and check to see if the button state is OFF. That qualifier looks like the example shown to the left, below.

The second qualifier is simply a check to make sure that there is no memory value. We have decided to use a single memory location for this and we have named it "latch_memory"

The memory qualifier looks like the example shown to the right, below.

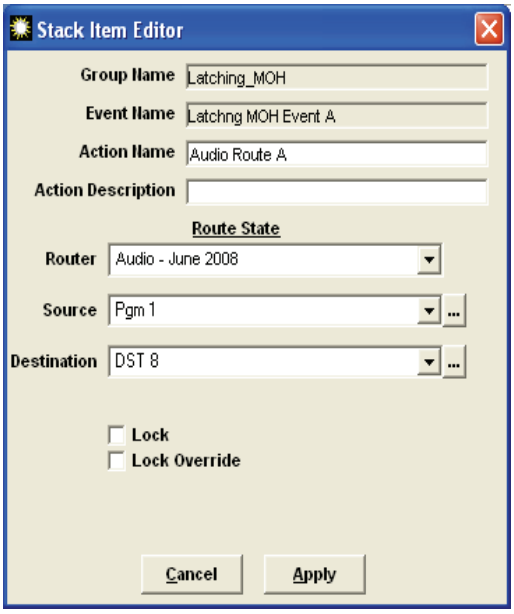


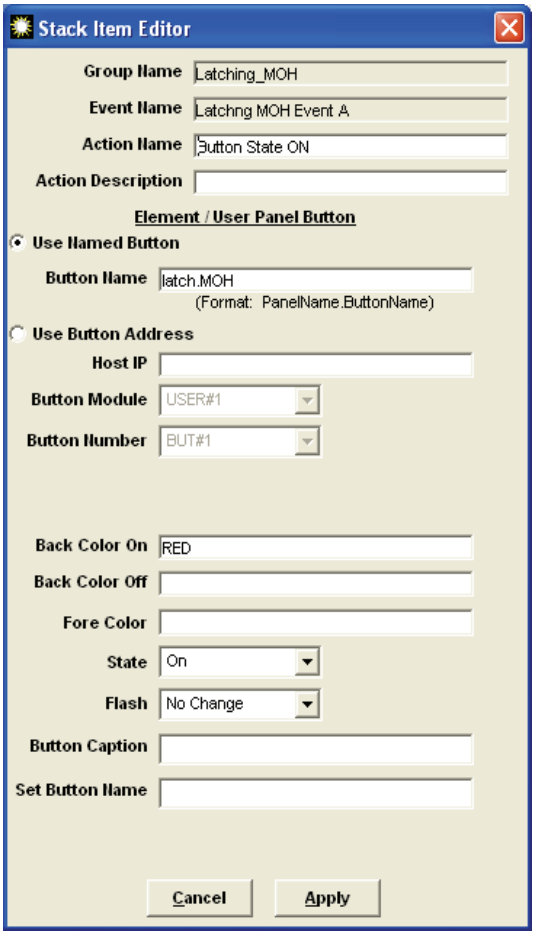




Now for the actions of Event A. First we will write something to memory - in this example, we write ENGAGED, as shown in the example to the left.

Then, we will establish an audio route. In this case, we will route PGM 1 to destination 8 of a microphone node, as shown in the example on the right.

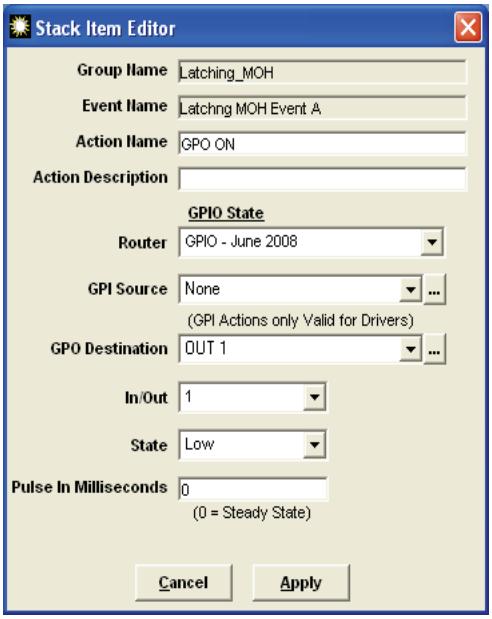




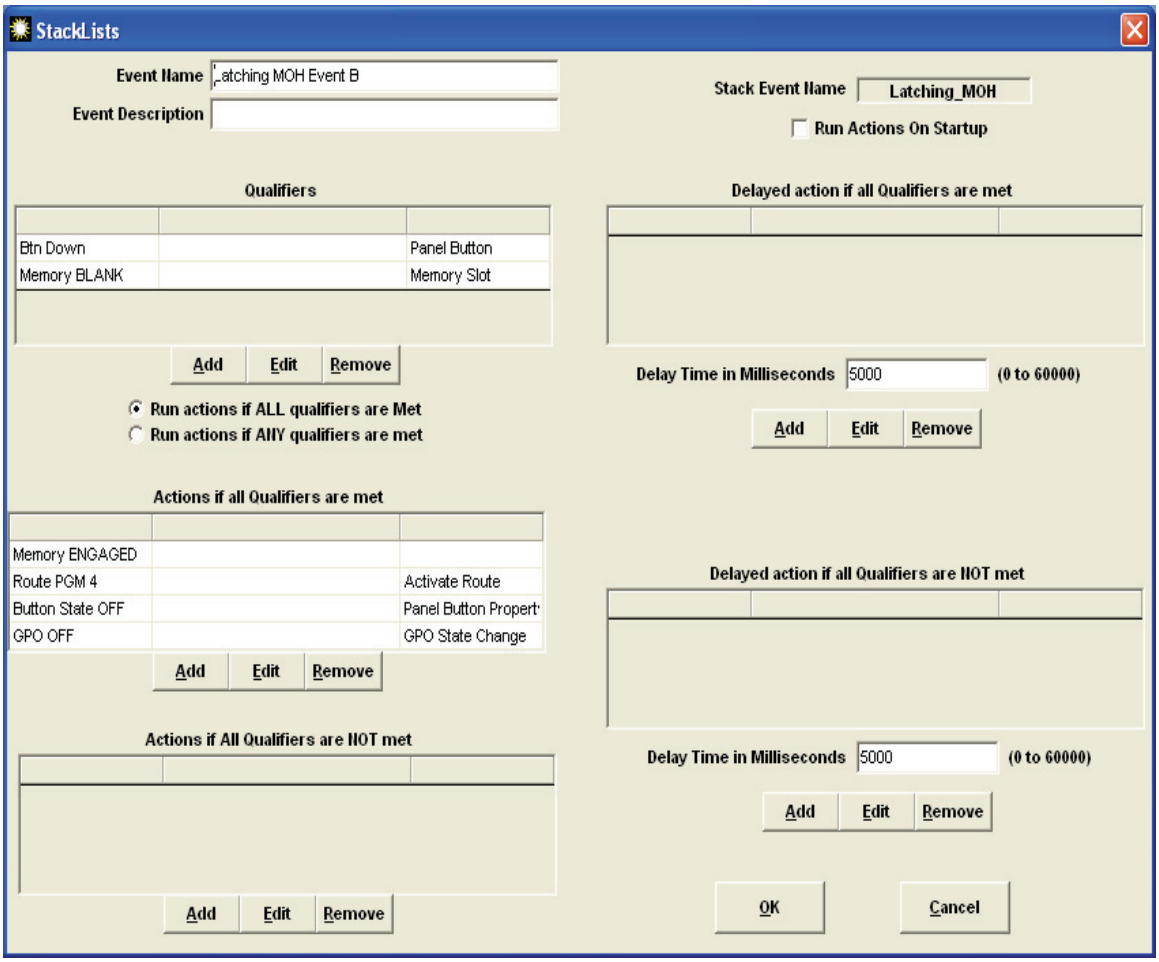
Next - change the button state to ON and give it some color - RED in this example.

Just to illustrate another option, we have decided that we will also change the state of a GPO to ON and this will also reflect our button state.

We've just created Stacking Event A! Now let's move on to Stacking Event B.



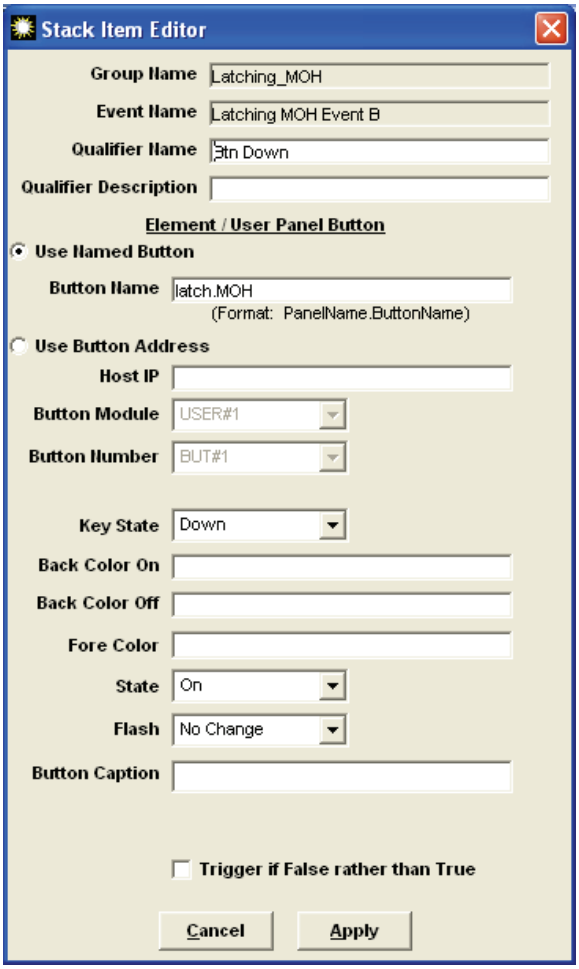
Now we will create another stacking event called Event B to create a set of different actions if the latching switch state is already ON. It will look like this.

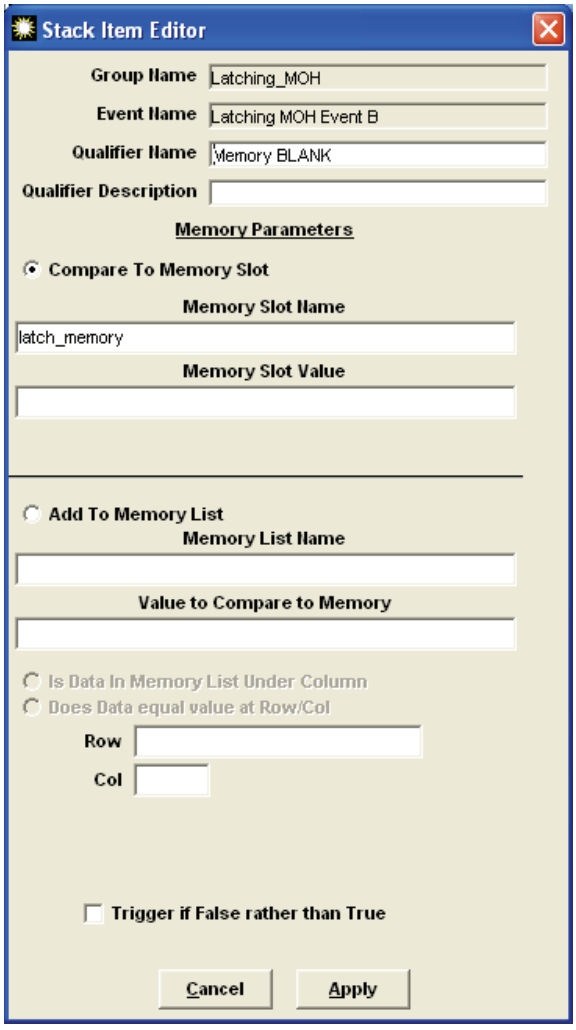


Event B has very similar qualifiers and actions to Event A which we just created. The differences are that this event runs if the switch state is ON and it will create a different audio route.

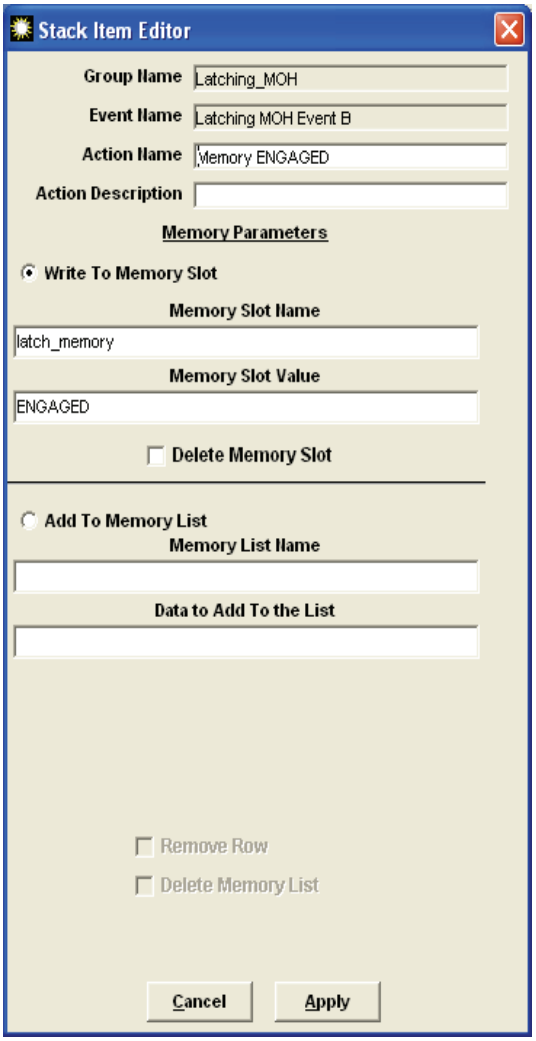
Below left is the Button Down qualifier for Stacking Event Bthat checks for the button press and the button state of ON.

Then, a memory check, identical to the one in Event A, takes place to make sure there is no memory value, as shown below right.



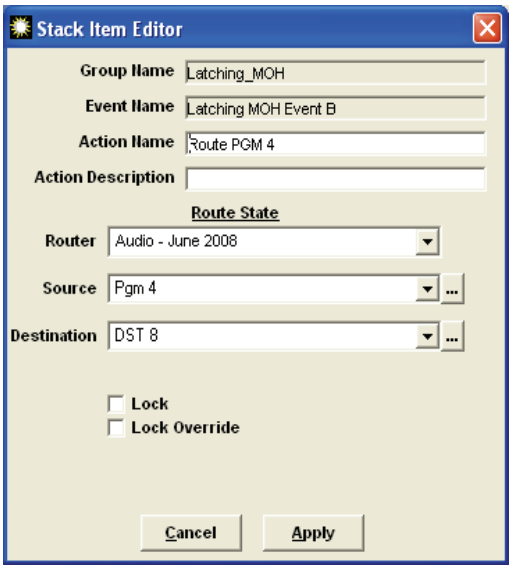


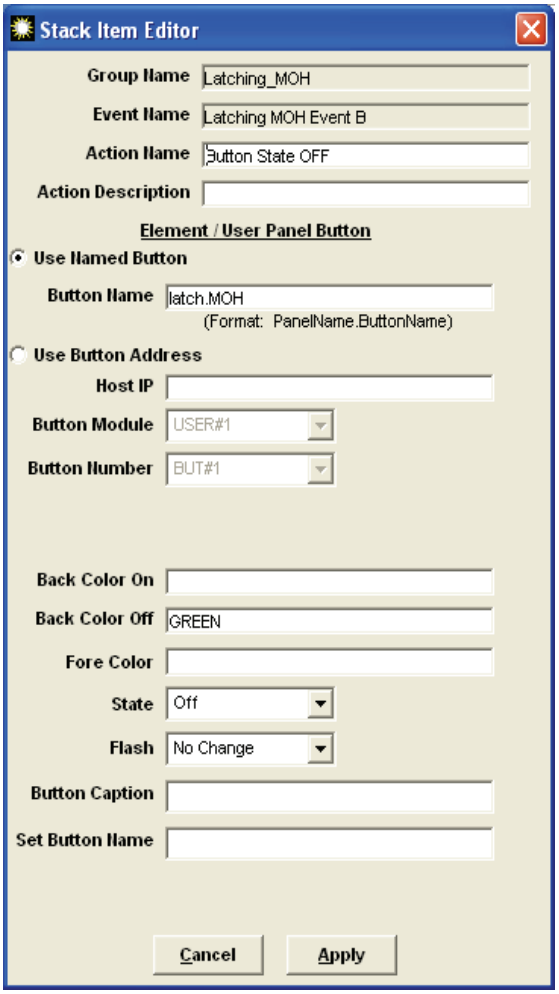
Now, we'll create our Actions.



First, as with Event A, we will write a memory value.

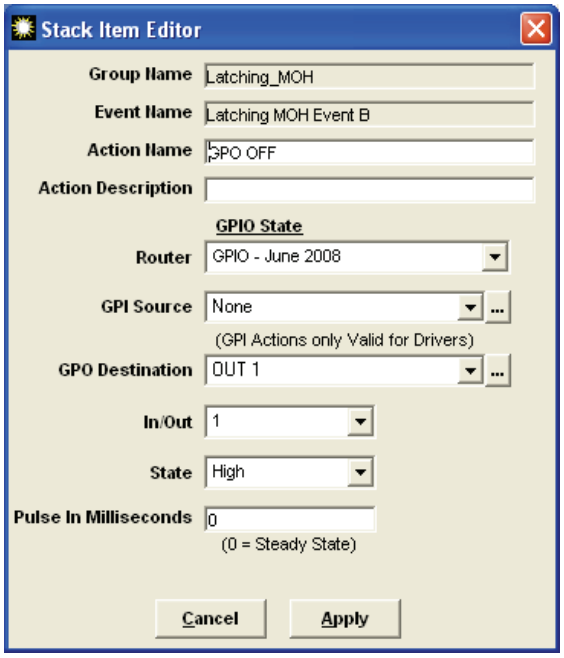
Then we will establish an audio route. In this example, we are routing PGM 4 to destination 8 of the microphone node which changes the route we had established in Event A.





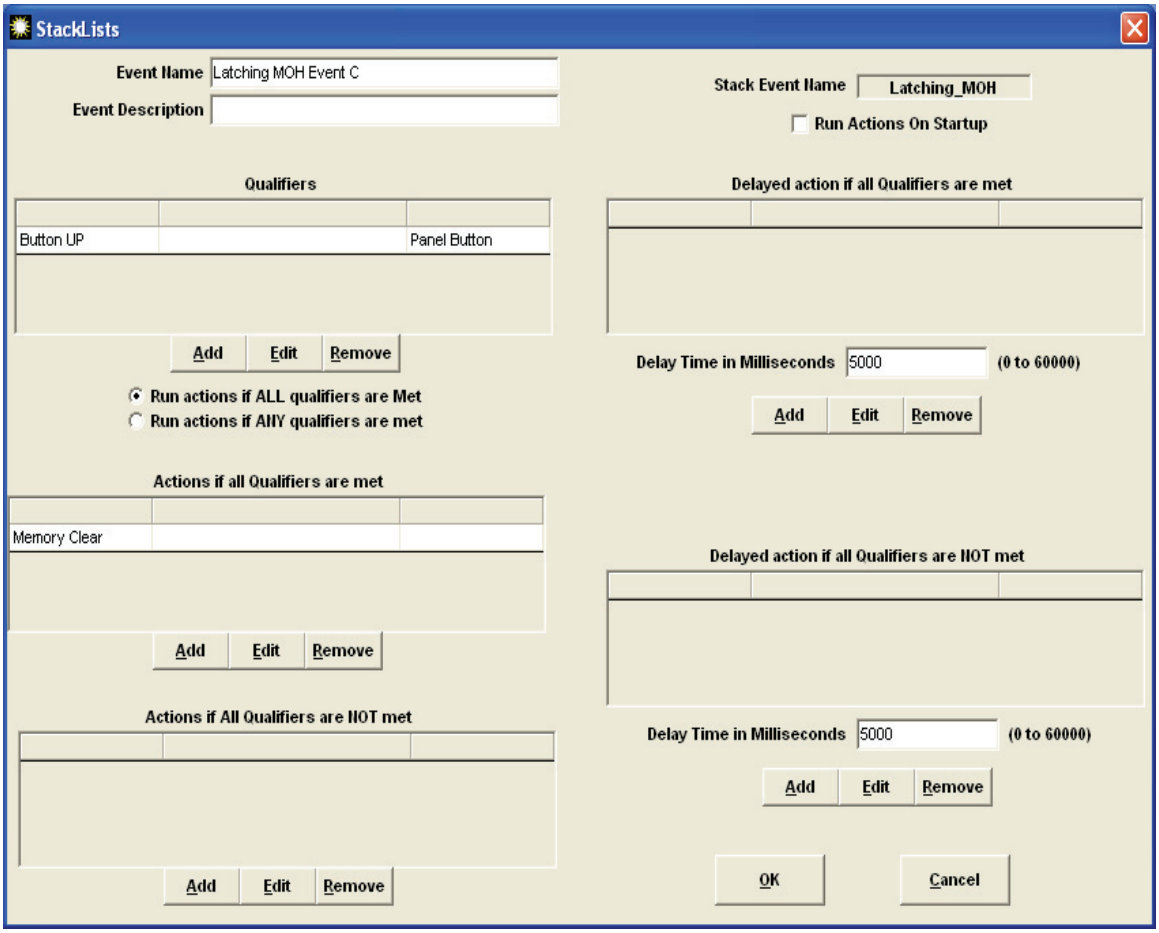
Next, we will change the button state. We checked to see if it was ON before we ran this operation, and now we will set it to OFF plus change our background color to GREEN.

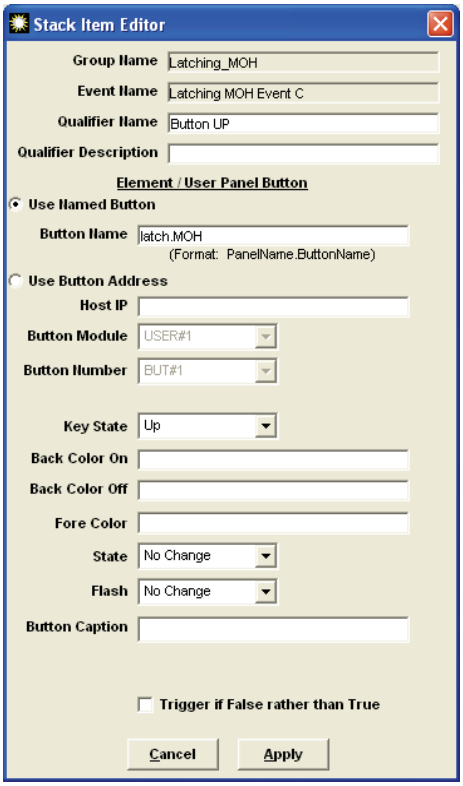
Lastly, we will change the GPO state to OFF to reflect our button state.



So far, so good! We have determined what happens if a button is pressed. Of course, most of the time the button will not be pressed so we also need to determine what happens in that case. So, we'll need to construct a Stacking Event C.

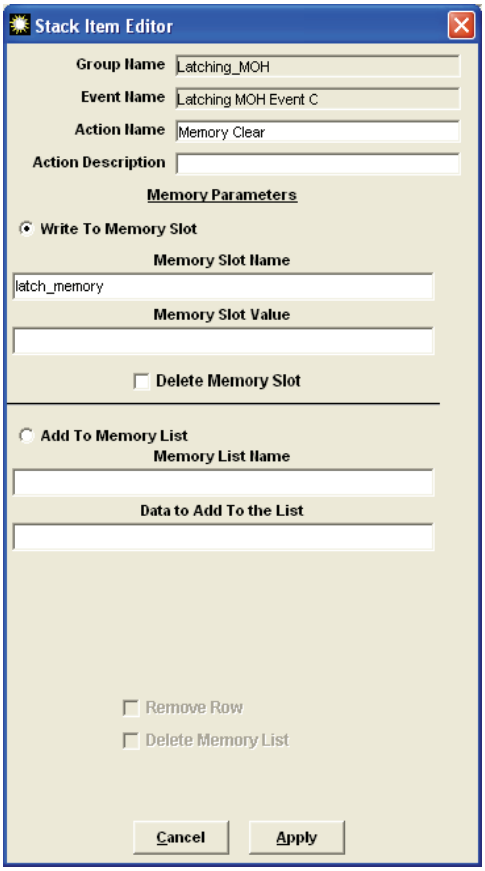
Stacking Event C is a very simple event that just clears the memory value whenever the button is not pressed. It will look something like this:





Here is the qualifier looking for a button state of UP…

…and here is the action of clearing the memory.



Just to prove this actually works, here are the results illustrating the two states of the latching mini panel button. Of course, you can get a lot prettier than this example. We want to show you the basics so you can use the example as a guide for more complex cases.

Here is Button ON state:

Here is Button OFF state:

Conclusion

There are lots of variations to the Latching Button theme. For instance, we could use hardware buttons on user panels or GPI as qualifiers. The resulting actions can be anything you want. The important things to remember are:

1. For a latching button you should use three stacking events
2. You must write a memory value
3. You must pay attention to the order of the qualifiers and actions – specifically, write the memory value *first*.

See how easy that was? Have fun!

For questions or assistance, please contact Axia Support at Support@AxiaAudio.com .