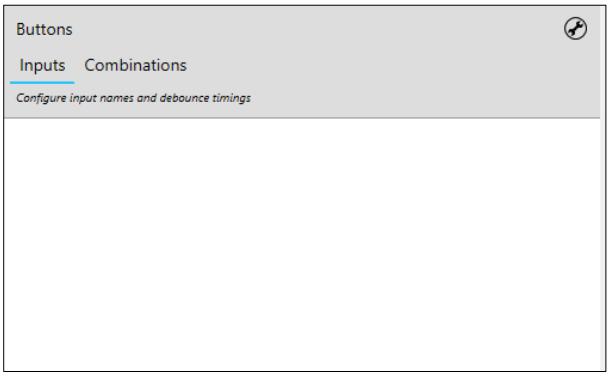
Buttons overview

Configuring buttons within Toolset is one of the best ways to expand functionality and allow flexibility when you create a setup. The following shows how you can configure buttons (with an emphasis on CCW & CSB), how buttons within Toolset are structured, and some examples of how to use them.

Configure button inputs

Add buttons

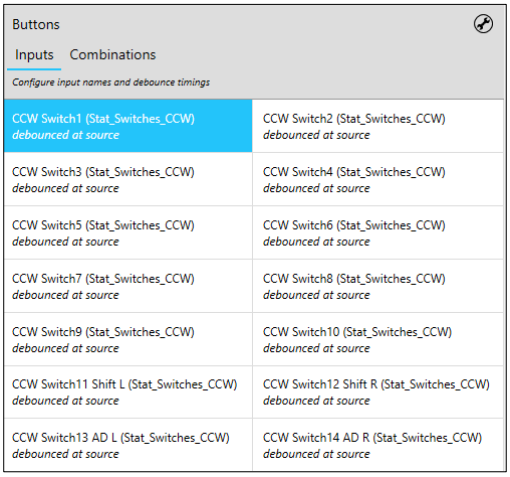
By default, on the **Buttons** node there are no entries on the **Inputs** page. Unlike a Maths channel or Logic channel, which are software defined, buttons are hardware defined. On devices such as the CCW and the CSB which communicate via CAN, the button properties are imported from the associated device CAN.



When you configure a CAN device such as the CCW or CSB, it comes with an associated CAN stream to transmit data between the primary device and the CAN device. Once the device stream has been imported to Toolset (see **Streams**), it automatically updates the **Buttons** node to show the available buttons.

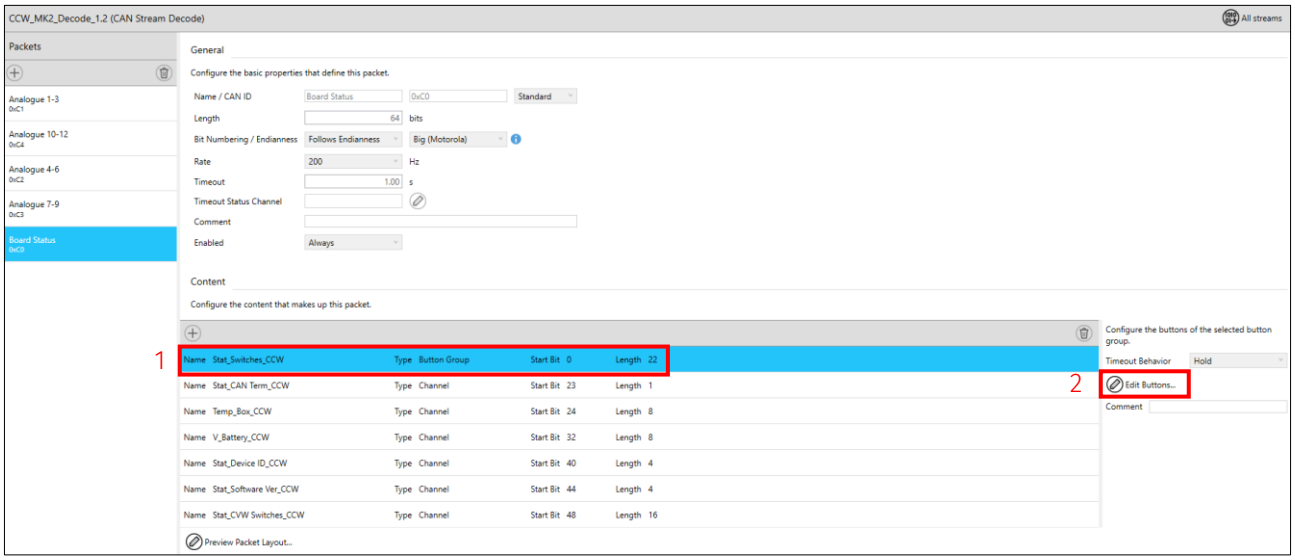
You can also generate your own virtual buttons via CAN streams and define any received channels as a 'Button Group'.

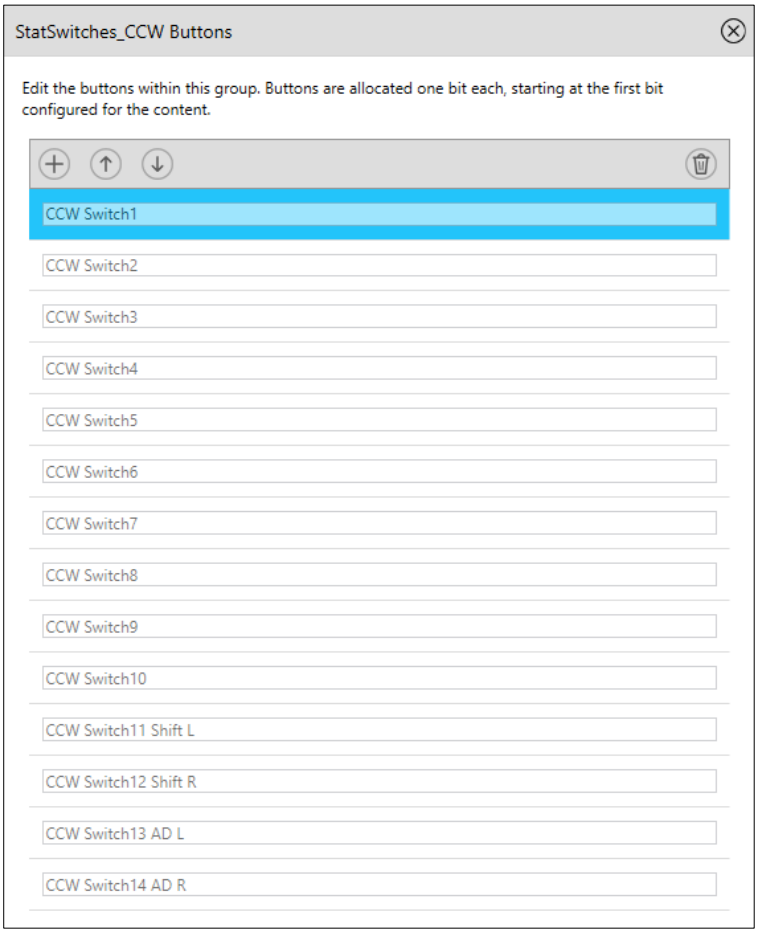
When the device stream is imported (a CCW stream in the example below), button inputs are shown on the **Buttons** node in the format of 'Name (Source)'.



Name buttons

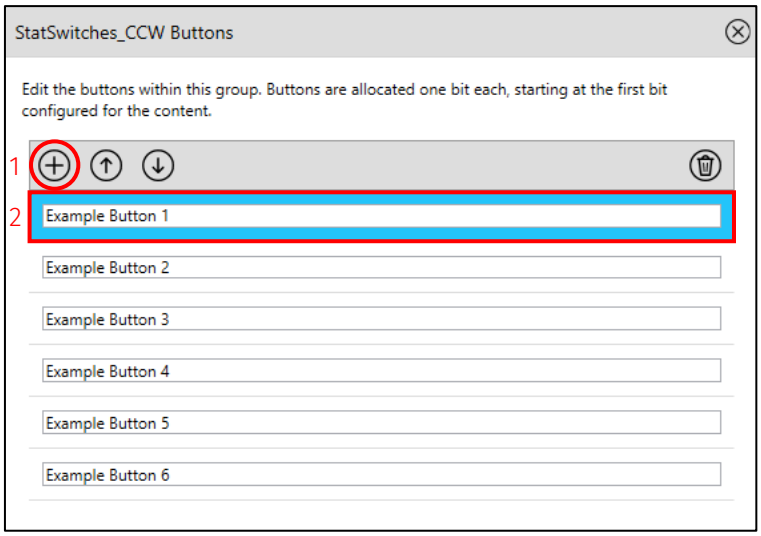
The name of the button is configured in the **CAN Streams** node. To edit the name of the button, select the 'Button Group' packet content (1), and then click **Edit Buttons** (2).





If a pre-compiled CAN stream for a device (that has been locked) is imported, you cannot edit the default button name, and it is greyed-out.

If a new CAN stream is compiled, you can add buttons by clicking the **+** icon (1), and then enter the button name (2).

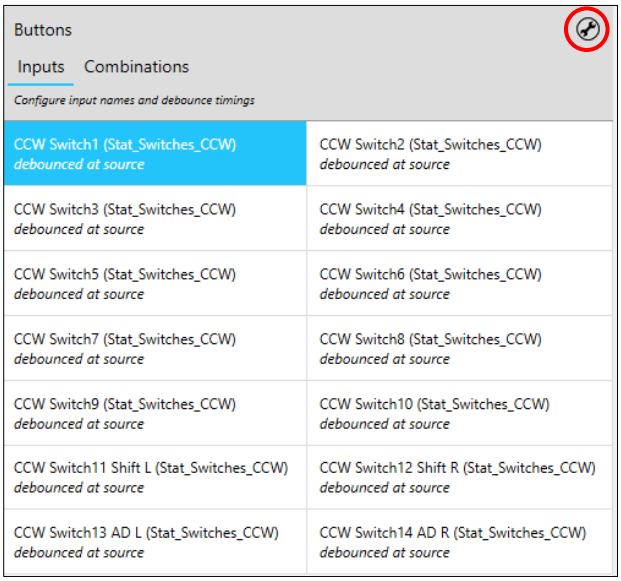


Configure button properties

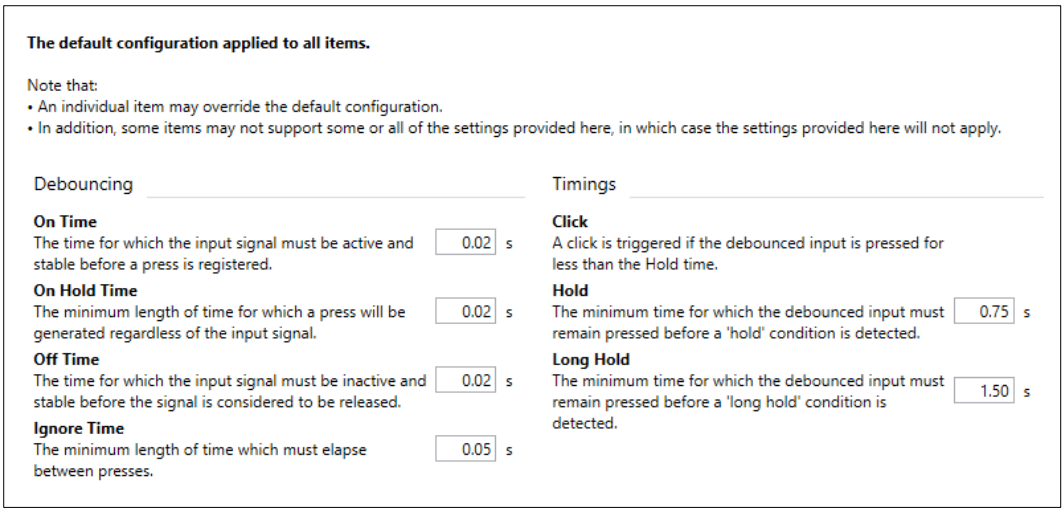
From the **Buttons** node, the **Button Configuration** option is displayed. Here the name of the button is displayed, and you can define the **Timing configuration**. Select or unselect the **Use default timings** option (1).

Click the 'Wrench' icon on the **Buttons** node to configure default timings.

Click the 'wrench' icon to display a dialog box where you can configure the default timing configuration.



You can configure timing configuration settings such as 'On', 'On Hold', 'Off, and 'Ignore' times under **Debounce**. 'Click', 'Hold', and 'Long Hold' timings are configurable under the **Timings** section.



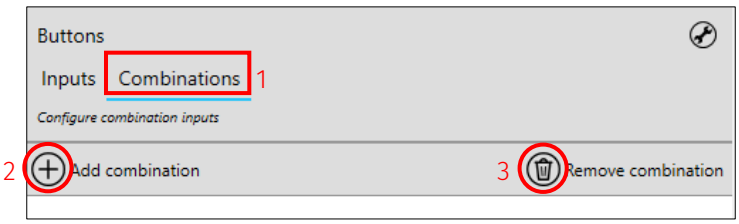
For most functions, the default values should work well.

Note: These settings are for all buttons on the Inputs tab. If you need to edit button settings, unselect the 'use default settings option.

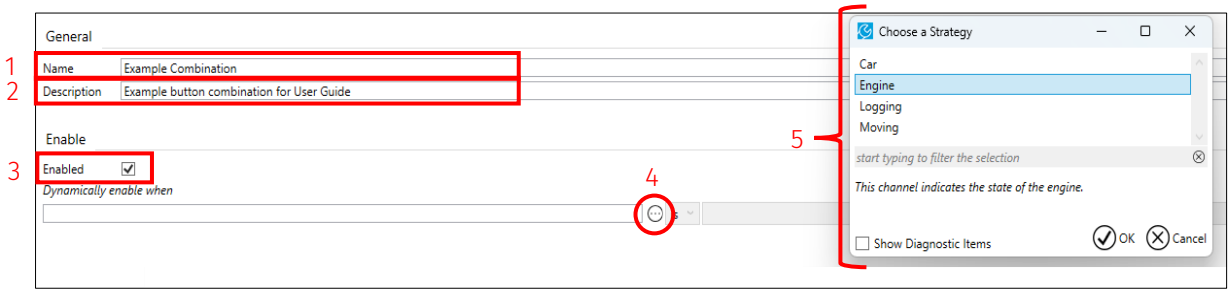
Configure button combinations

On the Combinations tab, you can configure channels that react from combinations of button inputs. For example, you can configure a channel to be triggered when two buttons are pressed simultaneously. This channel can be used to drive miscellaneous functionality within the setup.

To create a new button combination channel, click the Combinations tab (1), and then click the + button (2). Combinations can be deleted with the 'bin' icon (3).

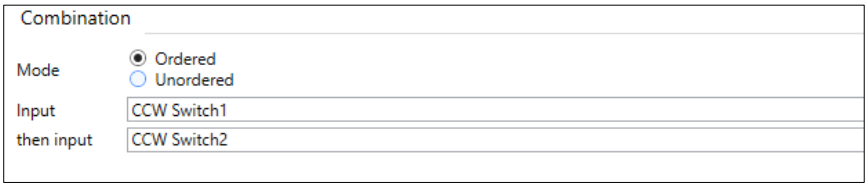


You can configure the new button combination. Name the combination (1), and then provide an optional description (2). You can select if the combination is enabled in the setup (3). You can then use the Choose a Strategy option to select the strategy condition (4/5.).

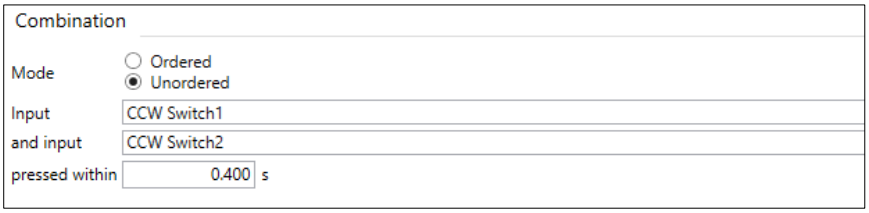


You can then define the button combination with options for the **Ordered** or **Unordered** button inputs:

- **Ordered**: the button needs to be pressed first, and then the second button to trigger the output channel.



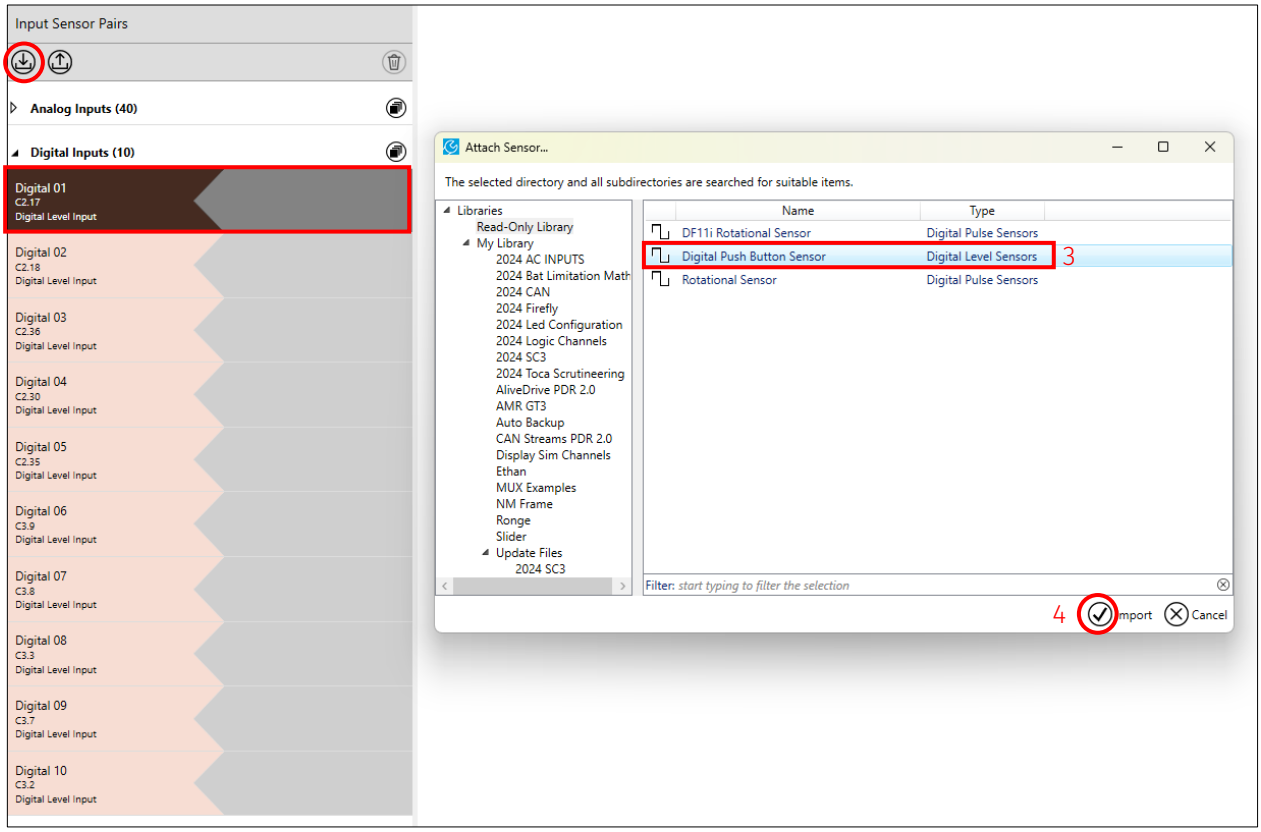
- **Unordered** – Two buttons must be pressed to trigger the output channel but a time threshold 'pressed within' must be defined to trigger the channel.



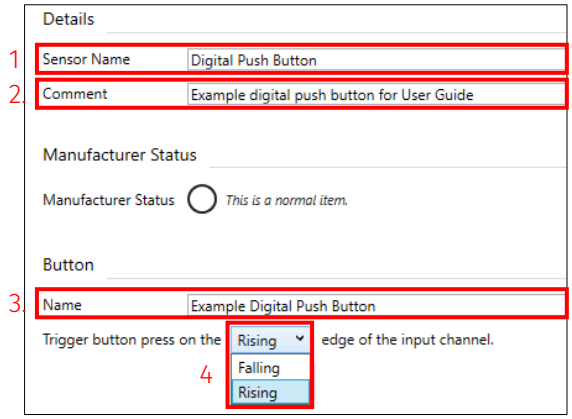
Configure a digital button

A button can also be configured from a digital input rather than from a CAN device. This is useful if you need an additional button in the setup which is separate to any CAN devices.

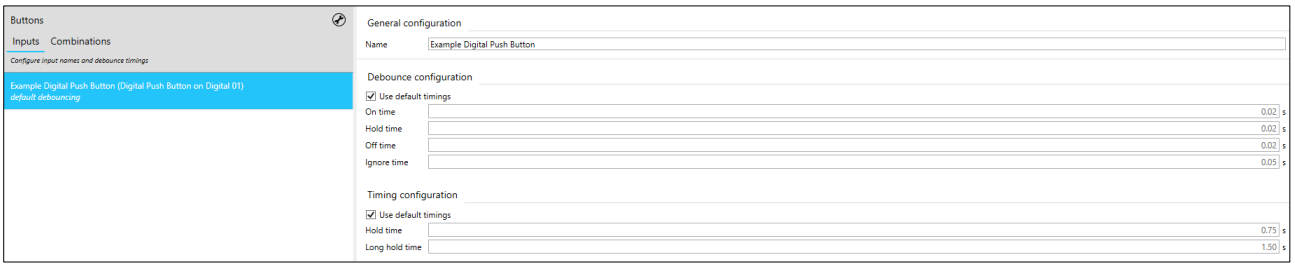
To configure a digital button, go to the **Sensors** node, and navigate to the available digital inputs. Click a digital input (1), click the import tool (2), select 'Digital Push Button Sensor' (3), and then click **Import** (4).



You can now configure the digital button. Enter a **Sensor Name** (1) and an optional comment about the digital button in the **Details** section (2). The actual button **Name** is configurable (3), as is the 'mode' (4), in the **Button** section. The 'mode' allows the user to configure if the button triggers on the rising or falling edge of the digital input channel.



Return to the **Buttons** node and acknowledge the creation of the digital button. The default button settings apply to this button, but default timings can be deselected. You can use the digital button in button combinations and in conjunction with CAN buttons.



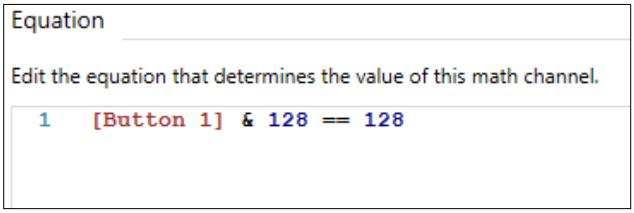
Button structure and examples

The CSB or CCW buttons consist of an 8-bit output to determine what type of button press is commanded. These are configured as bit-fields by default with bit 0 to the left, and bit 7 to the right. You might need to acknowledge specific buttons press types and ignore others. The table below shows the press type and the output bit number and decimal value:

Press Type	Bit Number	Decimal Value
Raw	0	1
Debounced	1	2
Clicked	2	4
Held	3	8
Long Held	4	16
Click Latched	5	32
Latched Held	6	64

Latched Long Held	7	128

For example, to command a Maths channel to enable on a 'Latched Long Hold', the channel syntax is configured as shown below:



For this channel, when the button value is both equal to 128 (the '& 128' portion of the equation) **and** equal to 128 (the '== 128' portion), then the button output is acknowledged. Therefore, there is no chance that an intermediary button state triggers the channel output. The computed Maths Channel generates a value of 1 or 0.