

Analog Outputs Section

Analog Outputs Configuration Page

This page is populated with a list of the Analog Output channels available for the selected **Hardware Configuration**. Map eHS Measurements, machine model outputs, and other simulated signals to each Analog Output channel to interact with external hardware. Gain, offset, minimum and maximum saturation factors can also be applied to the signals before they are output.

The following configuration options are available for each channel:

Source	Filters the list of available Elements to be mapped to the Analog Output channel. The available options are defined by the selected Hardware Configuration , however it is typical to see the following options by default:
<ul style="list-style-type: none"> • Not Connected 	No signal is mapped to the physical channel.
<ul style="list-style-type: none"> • Measurements 	eHS Measurements made in the circuit model. In the Element dropdown, select the name of the measurement to map.
<ul style="list-style-type: none"> • Sinewaves 	Sinewave outputs of the Sinewave Generators . In the Element dropdown, select the index of the Sinewave Generator whose output signal to map.
<ul style="list-style-type: none"> • CPU (VeriStand) 	VeriStand custom device channels on the CPU. If this Source is selected, the Element dropdown is populated with a single option displaying the name of the custom device channel whose value is mapped.
<ul style="list-style-type: none"> • Machine 	Output channels of the Machine Model . In the Element dropdown, select the name of the channel to map.
Element	The name or index of the signal to be mapped to the analog output channel. The options available in this dropdown depend on the selected Source . After the Gain , Offset , Min , and Max parameters have been applied to this signal, its conditioned numeric value will be output as a voltage on the corresponding Analog Output channel.
Gain	Signal gain. The mapped signal is multiplied by this value before the Offset , Min , and Max saturation are applied. This value can be overridden by the AOXX Gain custom device channel at runtime if Enable Gain and Offset as Channels is enabled.
Offset	DC offset of the signal, added after the Gain has been applied. This value can be overridden by the AOXX Offset custom device channel at runtime if Enable Gain and Offset as Channels is enabled.
Min	Lower saturation limit of the signal, applied after the Gain and Offset . Use this parameter to avoid exceeding voltage limitations of externally connected systems.
Max	Upper saturation limit of the signal, applied after the Gain and Offset . Use this parameter to avoid exceeding voltage limitations of externally connected systems.

The following configuration options are applied to all channels:

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Synchronization Mode	<p>Defines the synchronization master for the mapping algorithm that triggers an update to the analog output channels. This is a drop-down that specifies the available synchronization masters.</p> <p>When the Default option is selected, the mapping algorithm synchronizes directly to the analog output channels using handshaking. When the analog output channels are able to output new data, they will sample the mapping algorithm for new data. This default will be sufficient for most customer applications.</p> <p>When a synchronization master is specified, the analog output channels are written to as new data becomes available from the master. This option may be useful to reduce jitter in certain situations on a specific data path, such as when the source data is available at a lower rate than the analog output sampling rate.</p> <p>Example: When the eHS simulation is set to a timestep of 2us and the analog output sampling occurs every 1us, the user may want to synchronize to the Measurements source to reduce jitter in the eHS to analog output data path.</p>
Enable Gain and Offset as Channels	<p>Enables on-the-fly updates of the signal gain and offset. When this option is enabled, an Advanced subsection is created under the Analog Outputs section and populated with AOXX Gain and AOXX Frequency custom device channels as described in the Channels table below.</p>

Analog Outputs Section Channels

This section includes the following custom device channels:

Channel Name	Type	Units	Default Value	Description
AOXX	Input	Volts	0V	<p>The Analog Outputs section is populated with one AOXX custom device channel for each physical Analog Output channel available in the selected Hardware Configuration.</p> <p>If the CPU (VeriStand) Source option is mapped to an Analog Output channel, the value of its corresponding AOXX custom device channel defines the magnitude of the voltage output on the physical channel. If the CPU (VeriStand) mapping option is unused, the value of the channel does not affect the Analog Outputs or the simulation.</p>
AOXX Gain	Input		Gain	<p>Signal Gain to apply to channel AO<XX>.</p> <p>When Enable Gain and Offset as Channels is enabled, the Analog Outputs >> Advanced >> Gain section is populated with one AOXX Gain channel for each Analog Output channel. The default value of this channel is the value of the Gain parameter in the Analog Outputs Configuration Page.</p>
AOXX Offset	Input	Volts	Offset	<p>DC Offset to apply to channel AO<XX>.</p> <p>When Enable Gain and Offset as Channels is enabled, the Analog Outputs >> Advanced >> Offset section is populated with one AOXX Offset channel for each Analog Output channel. The default value of this channel is the value of the Offset parameter in the Analog Outputs Configuration Page.</p>