

NI-FGEN Standard Function

Configures and runs National Instruments signal generators using NI-FGEN in Standard Function output mode.

The NI 5404 frequency generator is not supported.

Dialog Box Options

Parameter	Description
Configuration	<p>Contains the following options:</p> <ul style="list-style-type: none">• Device—Specifies the signal generator used. This ring control lists all NI signal generators installed on this computer that can be used by this step. If you loaded this step as part of an existing project and the selected signal generator is dimmed, it is no longer available.• Output—Specifies the state of the output enable relay.• Function Setup—Configures the characteristics of the function to generate. Contains the following options:<ul style="list-style-type: none">- Type—Specifies the standard waveform for the signal generator to produce.- Frequency (Hz)—Specifies the frequency of the standard waveform.- Duty cycle (%)—Specifies the duty cycle of the square waveform. This value is the percentage of time the square waveform is high in a cycle.- Amplitude (Vpk)—Specifies the amplitude of the standard waveform. This value is the amplitude at the output terminal. For example, to produce a waveform ranging from -5.00 to +5.00 V, set Amplitude (Vpk) to 5.00.- DC offset (V)—Specifies the DC offset of the standard waveform. This value is the offset from ground to the center of the waveform. For example, to configure a waveform with an amplitude of 10.00 V to range from 0.00 V to +10.00 V, set DC offset (V) to 5.00.- Start phase (deg)—Specifies the horizontal

	<p>offset of the standard waveform.</p> <p>A start phase of 180 degrees means the output generation begins halfway through the period. A start phase of 360 degrees offsets the output by an entire waveform cycle, which is identical to a start phase of 0 degrees.</p> <ul style="list-style-type: none"> - Output impedance—Specifies the output impedance of the signal generator. - Load impedance—Specifies the load impedance. Using this control allows the signal generator to produce the correct output signal for the most common applications: high (>1 MΩ) load impedance; or matched output and load impedance.
<p>Trigger and Timing</p>	<p>Contains the following options:</p> <ul style="list-style-type: none"> • Trigger type—Specifies the type of trigger to use for starting waveform generation. Selecting an Immediate trigger starts waveform generation as soon as all configuration settings are applied. • Trigger source—Specifies the trigger source. The signal generator waits for the specified trigger to start waveform generation. <p>Refer to the <i>NI Signal Generators Help</i> to determine which digital trigger sources are valid for each signal generator.</p> <ul style="list-style-type: none"> • Edge—Specifies whether to trigger on a rising edge or a falling edge of a trigger signal. • Reference clock source—Specifies the source of a 10 MHz reference clock signal. The signal generator uses this reference clock source to derive frequencies when generating output. <p>Refer to the <i>NI Signal Generators Help</i> to determine which sources are valid for each signal</p>

	generator.
Execution Control	<p>Contains the following options:</p> <ul style="list-style-type: none">• Pre-execution delay (ms)—Specifies the amount of time to wait before the step executes. If you configure the step to start after another step, the delay represents the amount of time to wait after the step to wait for has started.• Post-execution delay (ms)—Specifies the amount of time to wait after the step executes.• Start this step after—Use this control to make the step wait until another step has started before executing. You can make the step wait on any other hardware step in the project by selecting it in the ring control. <p>You may need this control to force an acquisition device to start after a generation device has started. You may also use it to ensure that a device generating a trigger signal starts after the device receiving the signal, to avoid sending the signal before the receiver is ready.</p> <ul style="list-style-type: none">• Step to wait for—Lists the possible hardware steps for which this step can wait.

NI-FGEN Arbitrary Waveform

Configures and runs National Instruments signal generators using NI-FGEN in Arbitrary Waveform mode.

Dialog Box Options

Parameter	Description
Configuration	<p>Contains the following options:</p> <ul style="list-style-type: none">• Device—Specifies the signal generator used. This ring control lists all NI signal generators installed on this computer that can be used by this step. If you loaded this step as part of an existing project and the selected signal generator is dimmed, it is no longer available.• Output—Specifies the state of the output enable relay.• Generation Mode—Specifies the generation mode of the function generator. Contains the following options:<ul style="list-style-type: none">- Finite—Configures the signal generator to generate the waveform one time. In this generation mode, the step waits until waveform generation is complete or until the time specified by Max time (s) has elapsed, whichever occurs first.- Continuous—Configures the signal generator to generate the waveform continuously and starts the generation. In this mode, the step generates data continuously until the project is stopped or the step needs to be restarted. If the Shared Waveform data changes while the signal generator is generating, the continuous waveform generation is interrupted, the updated waveform downloaded to the device and the generation restarted.• Data Source—Configures the data source of the arbitrary waveform. Contains the following options:<ul style="list-style-type: none">- Shared Waveform—Select this control to generate a waveform from a LabVIEW SignalExpress data item. Use the Shared

data selector to specify the waveform to generate.

- **Shared data selector**—Specifies the waveform to generate.
- **Waveform from file**—Select this control to generate a waveform stored in a Hierarchical Waveform Storage (HWS) file. HWS files can be created by the NI-HWS API or the NI Analog Waveform Editor. Use the **Waveform file selector** to specify the file to load.
- **Waveform file selector**—Select the file that contains the waveform to generate. Use the **New waveform** and **Edit waveform** options to easily create and edit waveforms using the NI Analog Waveform Editor.
- **Output**—Contains the following options:
 - **Extract from waveform**—Specifies whether settings for **Sample rate (S/s)**, **Gain**, and **Offset (V)** should be extracted from the waveform or specified manually.

When **Extract from waveform** is not selected, first normalize the data points to a range of -1.00 to +1.00.

- **Sample rate (S/s)**—Specifies the sample rate with which the signal generator produces arbitrary waveforms.

This control is disabled if the option **Extract from waveform** is selected. In this case, the control displays the extracted value to apply to the signal generator.

- **Gain**—Specifies the factor by which the signal generator scales the data.

When **Extract from waveform is not**

selected, you must first normalize the data points to a range of -1.00 to +1.00. Use this control to scale the arbitrary waveform to other ranges. For example, to configure the output signal to range from -2.00 to +2.00 V, set **Gain** to 2.00.

This control is disabled if the option **Extract from waveform** is selected. In this case, the control displays the extracted value to apply to the signal generator.

- **Offset (V)**—Specifies the value the signal generator adds to the data.

When **When Extract from waveform** is not selected, you must first normalize the data points to a range of -1.00 to +1.00. Use this control to shift the arbitrary waveform range. For example, to configure the output signal to range from 0.00 to 2.00 V instead of -1.00 to 1.00 V, set **Offset (V)** to 1.00.

This control is disabled if the option **Extract from waveform** is selected. In this case, the control displays the extracted value to apply to the signal generator.

- **Output impedance**—Specifies the output impedance of the signal generator.
- **Load impedance**—Specifies the load impedance. Using this control allows the signal generator to produce the correct output signal for the most common applications: high (>1 M Ω) load impedance; or matched output and load impedance.

Refer to the *NI Signal Generators Help* for more information about impedance matching.

	<p>- Filters enabled—Specifies whether the onboard analog and/or digital filters are enabled.</p> <p>Refer to the <i>NI Signal Generators Help</i> for detailed information about filtering.</p>
<p>Trigger and Timing</p>	<p>Contains the following options:</p> <ul style="list-style-type: none"> • Trigger type—Specifies the type of trigger used for starting waveform generation. Selecting an Immediate trigger starts waveform generation as soon as all configuration settings are applied. • Trigger source—Specifies the trigger source. The signal generator waits for the specified trigger to start waveform generation. • Edge—Specifies whether to trigger on a rising edge or a falling edge of a trigger signal. • Update clock mode—Specifies the update clock to use. In Divide-Down sampling mode, the sample rate can only be set to certain frequencies, based on dividing down the update clock. However, in High-Resolution mode, the sample rate can be set to any value. In Automatic mode, NI-FGEN determines the correct update clock depending on the selected sample rate. <p>Refer to the <i>NI Signal Generators Help</i> to determine which modes are valid for each signal generator.</p> <ul style="list-style-type: none"> • Reference clock source—Specifies the source of a 10 MHz reference clock signal. The signal generator uses the reference clock source to derive sample rates when generating output. <p>Refer to the <i>NI Signal Generators Help</i> to determine which sources are valid for each signal generator.</p> <ul style="list-style-type: none"> • Sample clock output terminal—Specifies which

	<p>front panel terminal, if any, the signal generator should use to export the Sample clock signal.</p> <p>Refer to the <i>NI Signal Generators Help</i> to determine which terminals are valid for each signal generator.</p> <ul style="list-style-type: none"> • Max time (s)—Specifies the maximum time to wait for the finite waveform generation to complete.
<p>Execution Control</p>	<p>Contains the following options:</p> <ul style="list-style-type: none"> • Pre-execution delay (ms)—Specifies the amount of time to wait before the step executes. If you configure the step to start after another step, the delay represents the amount of time to wait after the step to wait for has started. • Post-execution delay (ms)—Specifies the amount of time to wait after the step executes. • Start this step after—Use this control to make the step wait until another step has started before executing. You can make the step wait on any other hardware step in the project by selecting it in the ring control. <p>You may need this control to force an acquisition device to start after a generation device has started. You may also use it to ensure that a device generating a trigger signal starts after the device receiving the signal, to avoid sending the signal before the receiver is ready.</p> <ul style="list-style-type: none"> • Step to wait for—Lists the possible hardware steps for which this step can wait.