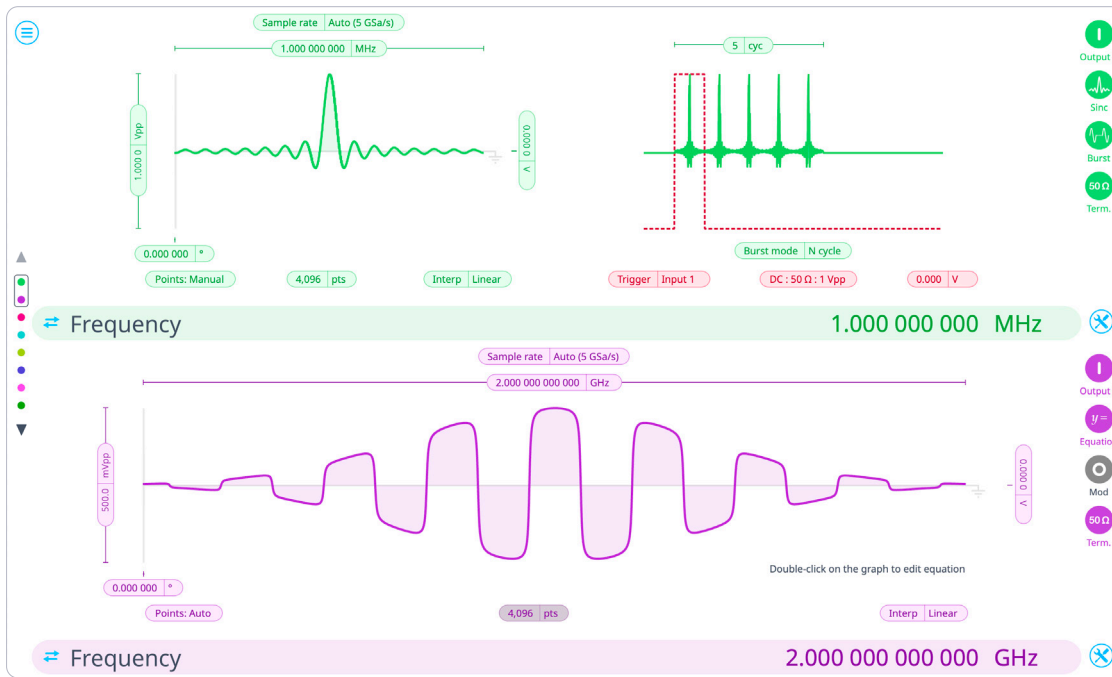




# Arbitrary Waveform Generator



The Moku:Delta Arbitrary Waveform Generator offers eight independent analog outputs with 14-bit resolution and supports sample rates up to 5 GSa/s with waveform lengths of up to 65,536 points. Users can define waveforms via file import or as up to 32-segment piecewise equations, with fine-grain control over amplitude, phase ( $0.001^\circ$  resolution), and DC offset ( $100\ \mu\text{V}$  resolution). Burst mode enables triggered waveform generation and channel synchronization, while pulsed mode supports precise dead time insertion between pulses for advanced timing control.



**Maximum Sample Rate**  
5 GSa/s

**Output Bandwidth**  
Up to 2 GHz

**DAC Resolution**  
14-bits

**Independent Triggering**  
Burst/Pulsed

**Supported Waveforms**  
5 predefined, segmented equations (up to 32), or custom

## Features

- Eight independent AWG channels with up to 2 GHz bandwidth
- Choose between preset waveforms, load points from a file, or input an equation directly
- Phase synchronization output between the eight channels
- Configure pulsed output with over 250,000 cycles of dead time between pulses
- Trigger output from TTL trigger port or any of the input channels
- Ultra-stable clock of 1 ppb with selectable 10 MHz or 100 MHz external reference

## Specifications

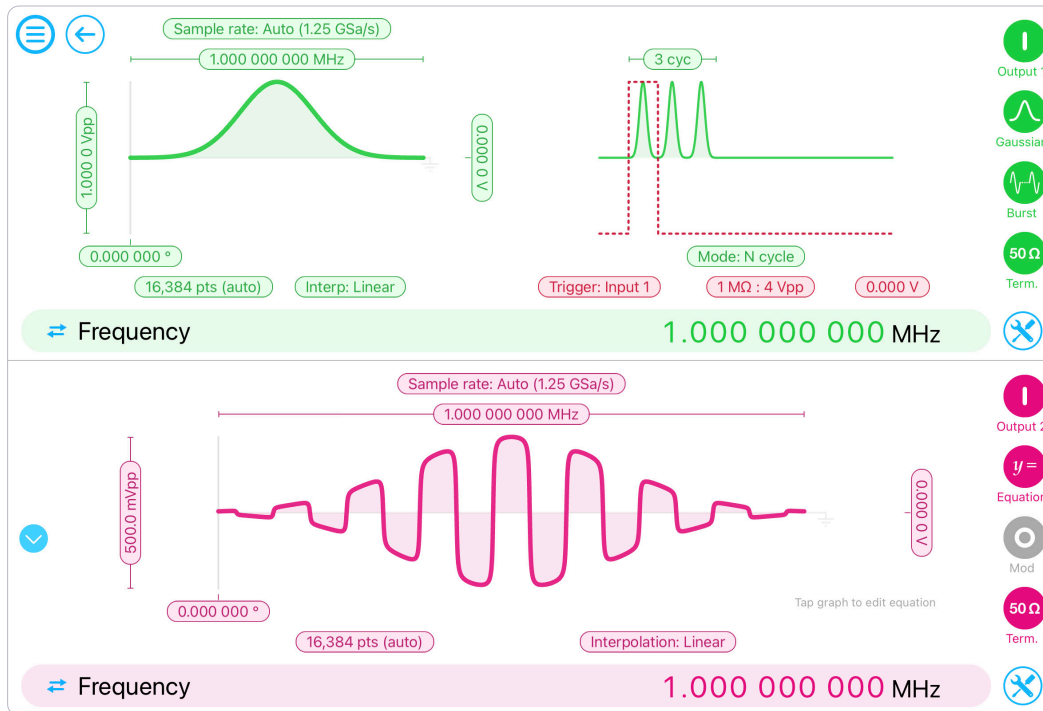
- Supported waveforms: Sine, Gaussian, Exponential fall, Exponential rise, Sinc, equation editor, and custom (from file)
- Output amplitude (50  $\Omega$ ):
  - 10 Vpp @ 312.5 MSa/s
  - 1 Vpp above 312.5 MSa/s
- DC offset:  $\pm 5\ \text{V}$  with  $100\ \mu\text{V}$  resolution
- Phase offset:  $0^\circ$  to  $360^\circ$  with  $0.001^\circ$  resolution
- Maximum output rate:
  - 312.5 MSa/s with 65,536 points
  - 625 MSa/s with 32,768 points
  - 1.25 GSa/s with 16,384 points
  - 2.5 GSa/s with 8,192 points
  - 5 GSa/s with 4,096 points

## Applications

- Random pattern scanning
- Sensor excitation and system identification
- Biomedical signal emulation
- Quantum optics and cold atom experiments
- Quantum control and qubit manipulation
- Multi-channel RF signal emulation
- Photonic modulation and pulse shaping
- Mixed-signal system co-simulation



The Moku:Pro four-channel Arbitrary Waveform Generator can generate four custom waveforms with up to 65,536 points and sample rates ranging from 312.5 MSa/s to 1.25 GSa/s. Load waveforms from a file or input as a piece-wise mathematical function with up to 32 segments, enabling you to generate truly arbitrary waveforms. In burst mode, waveform generation can be triggered from input channels with start or n cycle modes. In pulsed mode, waveforms can be output with more than 250,000 cycles of dead time between pulses.



**Maximum Sample Rate**  
1.25 GSa/s

**Output Bandwidth**  
Up to 500 MHz

**DAC Resolution**  
16-bits

**Independent Triggering**  
Burst/Pulsed

**Supported Waveforms**  
5 predefined, segmented equations (up to 32) or custom

## Features

- Four independent AWG channels with up to 500 MHz bandwidth
- Choose between preset waveforms, load points from a file, or input an equation directly
- Phase synchronization output between the four channels
- Configure pulsed output with up to 250,000 cycles of dead time between pulses

## Specifications

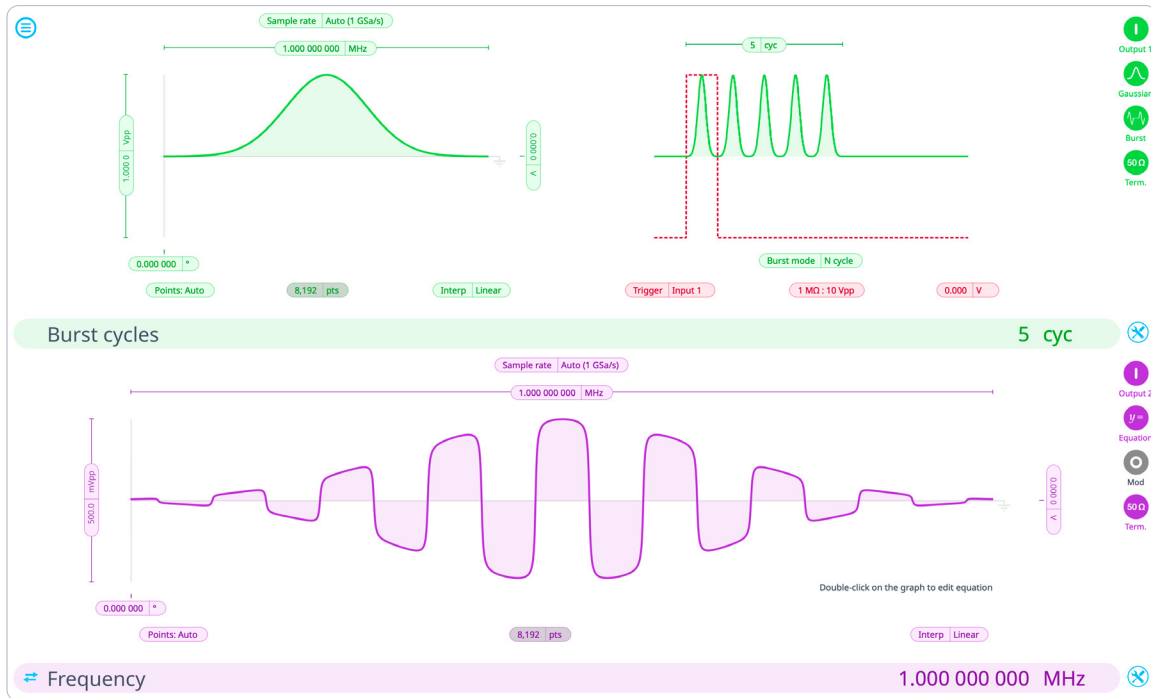
- Supported waveforms: Sine, Gaussian, Exponential fall, Exponential rise, Sinc, equation editor, and custom (from file)
- Output bandwidth:
  - 10 Vpp @ 312.5 MSa/s
  - 2 Vpp @ 625 MSa/s and 1.25 GSa/s
- DC offset:  $\pm 5$  V with 100  $\mu$ V resolution
- Phase offset: 0° to 360° with 0.001° resolution
- Maximum output rate:
  - 312.5 MSa/s with 65,536 points
  - 625 MSa/s with 32,768 points
  - 1.25 GSa/s with 16,384 points

## Applications

- Random pattern scanning
- System response simulation
- Additive manufacturing
- Quantum optics
- Quantum computing



The Moku:Lab Arbitrary Waveform Generator can generate custom waveforms with up to 65,536 points at sample rates of up to 1 GSa/s. Waveforms can be loaded from a file, or input as a piece-wise mathematical function with up to 32 segments, enabling you to generate truly arbitrary waveforms. In pulsed mode, waveforms can be output with more than 250,000 cycles of dead time between pulses, allowing you to excite your system with an arbitrary waveform at regular intervals over extended periods of time.



**Maximum sample rate**  
1 GSa/s

**Output bandwidth**  
300 MHz

**DAC resolution**  
16-bits

**Independent triggering**  
Burst/Pulsed

**Supported waveforms**  
6 predefined, segmented equations  
(up to 32), or custom

## Features

- Two independent AWG channels that can generate DC - 125 MHz waveforms
- Choose between one of the preset waveforms, load points from a file or input an equation directly
- Phase synchronization output between the two channels
- Configure pulsed output with up to 250,000 cycles of dead time between pulses

## Specifications

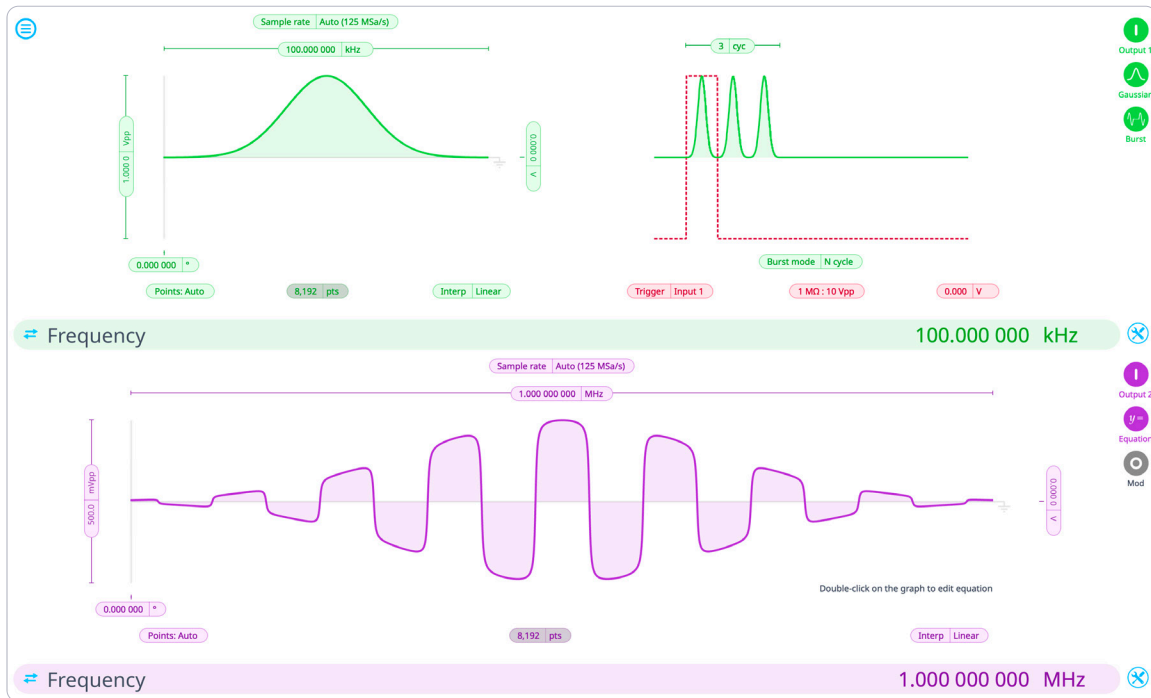
- Supported waveforms: sine, Gaussian, exponential fall, exponential rise, sinc, cardiac, equation editor, custom (from file)
- Output bandwidth: 300 MHz
- Output voltage: 2 Vpp into 50  $\Omega$
- DC offset: 2 Vpp with 100  $\mu$ V resolution
- Phase offset: 0° to 360° with 0.00 001° resolution
- Maximum output rate:
  - 125 MSa/s with 65,536 points
  - 250 MSa/s with 32,768 points
  - 500 MSa/s with 16,384 points
  - 1 GSa/s with 8192 points

## Applications

- Random pattern scanning
- System response simulation
- Additive manufacturing
- Quantum optics



Moku:Go's Arbitrary Waveform Generator can generate custom waveforms with up to 65,536 points at sample rates of up to 125 MSa/s. Waveforms can be loaded from a file or input as a piece-wise mathematical function with up to 32 segments, enabling you to generate truly arbitrary waveforms. In burst mode, waveform generation can be triggered from input channels with start or n cycle modes. In pulsed mode, waveforms can be output with more than 250,000 cycles of dead time between pulses.



**Maximum Sample Rate**  
125 MSa/s

**Output Bandwidth**  
20 MHz

**DAC Resolution**  
12-bits

**Independent Triggering**  
Burst/Pulsed

**Supported Waveforms**  
6 predefined, segmented equations  
(up to 32), or custom

## Features

- Two independent AWG channels with 20 MHz output bandwidth.
- Choose between one of the preset waveforms, load points from a file, or input an equation directly.
- Phase synchronization output between the two channels.
- Triggered start or n-cycle mode with burst output.
- Configure pulsed output with up to 250,000 cycles of dead time between pulses.

## Specifications

- Supported waveforms: Sine, Gaussian, Exponential fall, Exponential rise, Sinc, Cardiac, Equation editor, and Custom (from file)
- Output bandwidth: 20 MHz
- DC offset:  $\pm 5$  V with 3 mV resolution
- Phase offset:  $0^\circ$  to  $360^\circ$  with  $0.001^\circ$  resolution
- Maximum output rate:
  - 15.625 MSa/s with 65,536 points
  - 31.25 MSa/s with 32,768 points
  - 62.5 MSa/s with 16,384 points
  - 125 MSa/s with 8,192 points

## Applications

- Random pattern generation
- System response simulation
- Additive manufacturing
- Instrument response function simulation