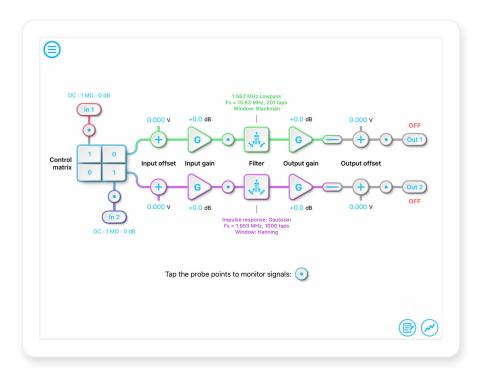# FIR Filter Builder

With Moku:Lab's FIR Filter Builder, you can design and implement lowpass, highpass, bandpass, and bandstop finite impulse response (FIR) filters with up to 14,819 coefficients. Moku:Lab's iPad interface allows you to fine-tune your filter's response in the frequency and time domains to suit your specific application. Select between four frequency response shapes, five common impulse responses, and up to eight window functions.

Sampling Rate	Filter Coefficients	Input Range	Output Voltage Range	Integrated Oscilloscope
Up to 15.625 MHz	Up to 14,819	± 0.5 V or ± 5 V	± 1 V into 50 Ω	500 MSa/s

Features

- Visualize your signal and configuration in real-time: design filters in the time domain or in the frequency domain
- Visualize the filter's transfer function, impulse and step response, or group and phase delay
- Block diagram view of the digital signal processing with built-in probe points for signal monitoring
- Load your own filter coefficients or enter an equation to create a customized impulse response

Specifications

- Independent channels: 2
- Coefficient count at various sampling rates:
  - 2 to 232 @ 15.63 MHz
  - 2 to 928 @ 3.906 MHz
  - 2 to 3712 @ 976.6 kHz
  - 2 to 14819 @ 244.1 kHz
- Filter coefficient precision: up to 24 bits
- Design domains: time (impulse response), frequency (frequency response)
- Impulse response: rectangular, sinc, equation input, custom, etc
- Frequency response: lowpass, highpass, bandpass, bandstop

Applications

- Impulse response simulation
- DSP system design
- Noise filtering
- Signal amplification