

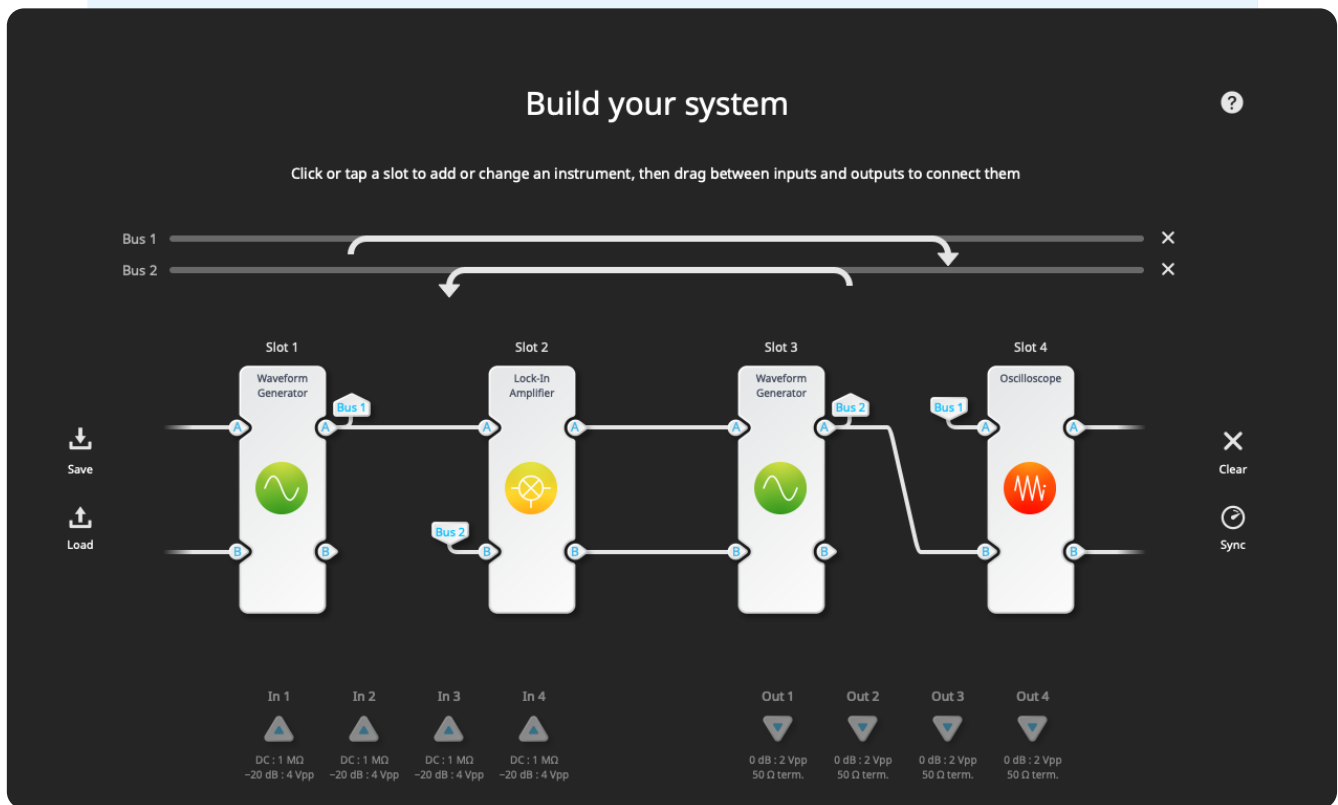


# Phase-locked loop checklist

Fast-track digital PLLs with the Lock-in Amplifier and Waveform Generator

## 1. Build your PLL system and set up connections

- After connecting to your Moku device, select Multi-instrument Mode.
- Set up a Waveform Generator in both Slot 1 and Slot 3, a Lock-in Amplifier in Slot 2, and an Oscilloscope in Slot 4.
- Set the connections according to the diagram below.



## 2. Set up the instruments

- Enter the Waveform Generator in Slot 1 and enable the output. Adjust the frequency and amplitude as needed.
- Open the Waveform Generator in Slot 3. Enable the output and set the modulation type to FM. Set the center frequency and the modulation depth. Change the source of the FM from “Internal” to “Input A.”
- Enter the menu for the Lock-in Amplifier. Change the demodulation source from “Internal” to “External (PLL).” Click on the PLL block and set the frequency and bandwidth. Adjust the lowpass filter and coordinate frame. Flip the switch to  $\theta$  and give the signal a small gain boost.
- Make sure all the switches are closed and enable the output. Click “Reacquire.”

## 3. Verify your PLL

- Enter the Oscilloscope and select an appropriate window from the “Timebase” tab. You should see a phase-locked signal on Channel B.

