



## Waveform Capture, Modification and Playback Using a Function Generator

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**Function generators** are used to simulate real-world signals on a device. A speaker test might require a sweep through an audio band over several seconds or a DSP controller may need different pulse waveforms to simulate varying frequencies of a clock. However, real-world signals are not always perfect sine waves or pulses. It is more useful to capture a real-world waveform, modify it and recreate the waveform with a function/arbitrary waveform generator during design validation or qualification testing. Using a system such as the Agilent 33220A function/arbitrary waveform generator along with the free Agilent IntuiLink Waveform Editor provides flexibility and reduces the headaches of trying to capture, modify and playback real-world signals.

### Snapshot: Immunity testing

When lightning strikes, power lines and other signals experience disturbances caused by the power surge. A home electronics manufacturer found that lightning affected the input power signal to the IC board in its product. The phase-locked loop retained its lock with additional noise on the signal. The manufacturer needed to characterize the power signal of the board through a series of immunity tests to ensure proper behavior of the product after an uncontrollable event, such as lightning, occurs. By using an oscilloscope to capture the standard signal of the board and the Agilent IntuiLink Waveform Editor software to import the oscilloscope data, the manufacturer was able to add noise to the signal and export it to the Agilent 33220A function generator. This solution provided improved productivity during test development.

### Creating arbitrary waveforms

Recreating a modified standard waveform requires arbitrary waveform capabilities. With modern arbitrary waveform generators that use direct digital synthesis (DDS) technology, you can create arbitrary waveforms two ways: from the front panel or by using software. Graphical user interfaces and linear interpolation make it easy to create simple waveforms from a generator's front panel, but a software application is recommended for more complex arbitrary waveforms.

The Agilent IntuiLink Waveform Editor is a powerful stand-alone application for creating arbitrary waveforms.

Waveform data can be imported from a file or captured using an oscilloscope. From here, you can modify or design waveforms from scratch using the waveform editor. Once you create the waveform, you can download it to the Agilent 33220A or 33250A function generator. In addition, complete instrument setups can be saved and restored from the PC.

- Create waveforms graphically
- Import waveform data
- Modify waveforms
- Transfer waveforms from the PC to the function generator
- Manage waveforms

### Measurement Tips Using Agilent IntuiLink Waveform Editor:

- If you are having trouble importing the waveform from your oscilloscope, check to see if the version of the IntuiLink software supports your oscilloscope. You may need to install an add-in that will help you connect to newer oscilloscopes.
- There are additional IntuiLink add-ins for pulse creation, filtering and equation editing available on the IntuiLink home page at [www.agilent.com/find/intuilink](http://www.agilent.com/find/intuilink)

### Summary

Capturing, modifying and recreating a waveform involves arbitrary waveform capabilities. We have discussed the Agilent IntuiLink Waveform Editor which simplifies this process by providing an easy way to download waveforms from a file or an oscilloscope, modify the signal with filters or math functions, and export the waveform to an Agilent function/arbitrary waveform generator.



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