DDS option boosts flexibility of general-purpose AWGs

***Grosshansdorf, Germany – 11. March 2026*. Spectrum Instrumentation has introduced a new Direct Digital Synthesis (DDS) option for its 65xx series Arbitrary Waveform Generators (AWGs), providing a highly economical solution for generating sinusoidal signals, finely tuneable reference sources, combined sine waves, waveform trains, frequency sweeps, and modulated signals. The release completes the rollout of DDS functionality across Spectrum's entire AWG portfolio, which now includes more than 70 DDS-enabled product variants, supporting multitone, multi-channel signal generation with bandwidths up to 3.9 GHz.**

Link to the product video (5 min):

Combining traditional AWG operation with a powerful DDS mode in a single instrument, the 65xx series delivers exceptional performance. In DDS mode, each channel can generate up to 16 individual sine wave tones, with frequency, amplitude, and phase controlled through simple commands that allow parameter changes with just 8 nanoseconds spacing. This approach enables the fast creation of multitone and modulated signals without large data transfers or complex waveform calculations.

waves (shown as FFT), programmed with just a few commands or adjusted with the DDS CONTROL surface.

AWG-Mode

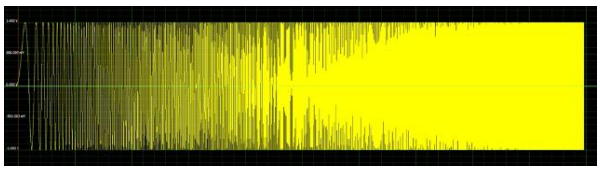
Designed for everyday test and measurement applications, the 65xx series offers a compact, general-purpose platform with output rates from 40 MS/s to 125 MS/s, 16-bit resolution, and bandwidths up to 70 MHz. Individual cards provide 1 to 8 channels, while complete systems can scale to 80 fully synchronized channels, making the series suitable for both stand-alone use and larger automated test systems. The products are available in two industry-standard form factors: PCIe cards for direct installation in PC-based systems, and LXI stand-alone instruments that support Ethernet-based control in laboratory and production environments.

DDS-Mode

With the new DDS option, advanced features such as frequency and amplitude slopes, along with flexible command sequencing, allow engineers to adapt signals in real time. These capabilities are particularly valuable in applications that require agile frequency sources to help identify resonant frequencies or compensate for system drift, like in network stimulation, automated testing of filters and amplifiers, or the operation of medical and industrial sensors. Here are two examples of other automated testing applications:

Examples

Example 1 shows how the option generates a slowly swept sine wave from 20 Hz to 20 kHz. Such waveforms are commonly used to drive vibration shakers when identifying mechanical resonance and fatigue in automotive and aerospace applications. The 65xx series DDS option can run up to 16 parallel sweeps with different frequency ranges, significantly reducing test time.



Example 1: Sine wave sweep to drive a vibration shaker.

Example 2 shows waveforms for circuit fault detection by simulating voltage and current transducer outputs. The upper trace simulates a three-phase power fault with a line-to-ground fault on phase A. The lower trace shows the resulting phase A current, demonstrating the DDS option's ability to generate non-sinusoidal waveforms such as an exponentially decaying current.

Example 2: T

Software & Service

Optimized for computer-controlled operation, all 65xx series instruments use Spectrum Instrumentation's unified software toolkit, simplifying system integration and future upgrades. Software support is provided for Windows and Linux, with programming examples for Python, MATLAB, C++, and LabVIEW, as well as a high-level Python API. A complimentary "DDS CONTROL" GUI is also included, enabling simple signal generation and control without the need for any programming.

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All products are backed by lifetime technical support directly from Spectrum Instrumentation's engineering team, along with free software and firmware updates.

About Spectrum Instrumentation

Spectrum Instrumentation, founded in 1989, uses a unique modular concept to design and produce a wide range of more than 250 digitizers and generator products as PC-cards (PCIe and PXIe) and stand-alone Ethernet units (LXI). In over 35 years, Spectrum has gained customers all around the world, including many A-brand industry-leaders and practically all prestigious universities. The company is headquartered near Hamburg, Germany, and is known for its 5-year warranty and outstanding support that comes directly from the design engineers. More information about Spectrum can be found at www.spectrum-instrumentation.com

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