

Migrating 33210A to EDU33210A & 33500B Waveform Generators

For Uncompromising Performance and Enhanced Capabilities

Overview

The Keysight Technologies, Inc 10-MHz 33210A Function/Arbitrary Waveform Generators is a legacy instrument of the 332xx family. Generating waveforms using direct digital synthesis (DDS) technology with uncompromising performance at an affordable price.

With the retirement of the 33210A, EDU33210A Series continues its offering of uncompromising performance at affordable prices with enhanced capability from the 33210A; while the 33500B Series provides the next generation of Function/Arbitrary Waveform Generators with higher performance and flexibility while maintaining compatibility with the 33210A.



Introduction

The EDU33210A Series and the 33500B Trueform Series are designed to be compatible with the 33210A, with several exceptions. Many of these differences improve the performance of the 33210A function generators.

The 2 sections below cover the comparison on the Key Features and Specifications as well as the Usability of Functions. The few differences between the 33210A, EDU33210A Series and 33500B Trueform Series generators that might affect migration are listed below.

Product Replacement Guide

If you use these models/options:	Now order these models for:	
	EDU33210A Series	33500B Series
33210A function/arbitrary waveform generator, 10 MHz	EDU33211A Waveform Generator, 20 MHz, 1-channel	33509B Trueform Waveform Generator, 20 MHz, 1 channel
Opt.001 External timebase reference	N/A	Built-in external timebase reference
Opt. 002 8K-point arbitrary waveform generator	Built-in 8MSa arbitrary waveform generator	33511B Trueform Waveform Generator, 20 MHz, 1 channel, with built-in 1MSa Arb (optional 16MSa Arb)

Table 1. Product Replacement Guide

Key Features and Specifications

Trueform Technology

The EDU33210A Series and the 33500B Series comes with Trueform technology, which is unique to Keysight generators. Trueform offers greater waveform integrity than the old DDS architecture which is used in 33210A. Signal edges are now faster, having less jitter and are generally better

For more information on these differences see: Trueform Waveform Generation Technology Overview, publication number 5991-0852EN.

Table 2 below specifies the Key Specifications Comparison between the 33210A, EDU33210A Series and 33500B Trueform Series.

Specifications for Comparison	33210A	EDU33210A Series	33500B Trueform Series
Sample Rate	50 MSa/s	250 MSa/s	250 MSa/s
Bandwidth	10MHz	20MHz	20 MHz or 30 MHz
Amplitude Resolution	14-bit	16-bit	16-bit
Output Voltages (50 Ω)	10mVpp to 10Vpp	10mVpp to 10Vpp	10mVpp to 10Vpp
Arb Memory	8k points (optional)	8MSa	1MSa (16MSa optional)
Jitter	1 ns + 100 ppm (square wave)	≤ 5 MHz: 2 ppm of the period + 100 ps > 5 MHz: 100 ps	< 40 ps
Phase Noise (10 kHz offset)	-115 dBc/Hz	-105 dBc/Hz	-115 dBc/Hz
Total Harmonic Distortion (THD)	0.04%	< 0.075%	< 0.04%
Graphical display	256x64 monochrome	7-inch WVGA display	WQVGA color TFT LCD
IO connectivity	USB, LAN, GPIB	USB, LAN	USB, LAN, GPIB

Table 2. Comparison of Key Specification

Usability of Functions

When looking to replace reliable instruments like the 33210A, there are several factors to consider; not the least of which is compatibility and differences between the existing and recommended replacement models. Table 3 below summarizes all the key attributes of usability of functions on its similarity and differences.

Attributes	EDU33210A Series	33500B Trueform Series
Signal Type and Modulation	EDU33210A generators offer two channels of waveform output and phase synchronous two channel behavior (phase sync, 90 degrees phase offset and modulation by “other” channel, etc.)	Same as EDU33210A generator with additional phase synchronous two channel behavior such as Combine, and Sum etc.
Internal amplitude range	Internal amplitude range changes are different for each set of generators. Most users will not notice a difference, but those that expect a certain range of voltages before internal generator relay state changes should take notice.	

Attributes	EDU33210A Series	33500B Trueform Series
SCPI compatibility & Key Programming Differences	Response times may be different on programming interfaces on identical SCPI commands.	
	Response to the *IDN? command is unique and specific to each instrument. No IDN emulation mode is offered.	
	<p>The programming code utilizes the same syntax and can be used on the newer EDU33210A Series and 33500B Series models. However, users must add programming to make use of the new functionality. Some commands are not documented in the programming manual but are still available for backwards compatibility. For new systems, do not use the older commands.</p> <p>Commands that are in the SOUR:DATA subsystem are not documented but supported:</p> <ul style="list-style-type: none"> • APPLY:TRiangle • APPLY:USER 	
	The 33210A uses MEMory commands to configure power-on state recall; whereas the 33500B & EDU33210A generators uses MMEMory commands to configure from either the internal or USB file systems.	
	<p>LAN was available on the 33210A. The following LAN setup commands are no longer supported with the 33500B & EDU33210A generators.</p> <p>SYSTem:COMMunicate:LAN</p> <ul style="list-style-type: none"> • :AUTOip[:STATe] {OFF 0 ON 1} • :AUTOip[:STATe]? • :LIPaddress? • :MEDiasense {OFF 0 ON 1} • :MEDiasense? • :NETBios {OFF 0 ON 1} • :NETBios? 	
Connectivity	USB and LAN are available. GPIB connectivity no longer available.	USB, LAN & GPIB connectivity are available.
Mechanical size	The dimension is different, the size is 314 mm W x 130 mm H x 165 mm D	The height and width dimensions of the 33500B Trueform Series are the same as the 33210A models: 261.1 mm W x 103.8 mm H x 303.2 mm D
	BNC Input/Output Connectors are in different positions.	
Accessories	Instrument stacking kit (to use with other education series instruments) is available.	Rack mount kits and probe accessories are compatible with all products.
Manufacturing	All Keysight waveform generators are produced to the same rigorous quality standards and manufacturing process controls.	
Service and support from Keysight	Our worldwide team is available to help you calibrate your waveform generators or answer any questions about either instrument. Get peace of mind with Keysight's standard three-year warranty	
	The 33210A, EDU33210A Series and Trueform Series generators use different calibration procedures with different default passwords.	

Table 3. Comparison of Usability of Functions

Conclusion

Keysight's next generation of waveform generators with the new EDU33210A Series and Trueform 33500B Series generators offer signal fidelity that exceeds that of older generators. While the EDU33210A Series offers uncompromising performance at affordable prices with enhanced capability, the 33500B offers a virtual drop-in replacement for the 33210A function generators. For those looking for more bandwidth or signal flexibility, both the new EDU33210A and Trueform 33500B Series generators offer higher bandwidth options and a second channel.

Convert your existing systems today to our latest offering!

For more information about the EDU33210A Series waveform generators visit:

www.keysight.com/find/EDU33211A

For more information about the 33500B & 33600A Series Trueform waveform generators visit:

www.keysight.com/find/trueform

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

