

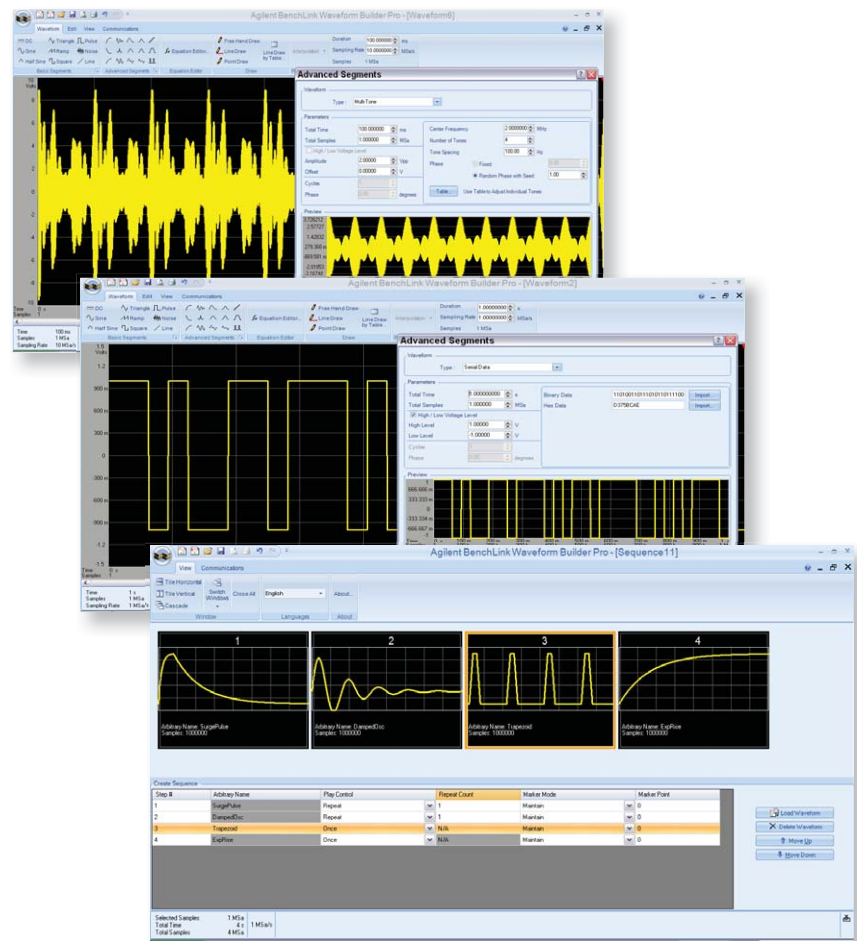
Agilent 33503A BenchLink Waveform Builder Pro Software

For Agilent Function/Arbitrary/Pulse Waveform
Generator Models 33522A, 33521A, 33250A, 33220A,
33210A, 81180A, 81150A

Data Sheet

Fast and Easy Analysis Tools for More Insight

- Standard waveform library provides quick access to common signals (DC, half-sine, noise, sine, square, triangle, ramp, pulse, exponential)
- Comprehensive library of built-in signals provides fast, easy access to complex signals
- Free-hand, point and line-draw modes to create custom shapes
- Equation editor enables creation of waveforms with exact polynomials
- Advanced math functions provide additional flexibility for more complex signals
- Sequencing editor to build and arrange composite waveforms for design optimization
- Filtering and windowing functions allow smooth transitions between waveforms
- Fast Fourier Transform (FFT) capability enables viewing of signal frequency characteristics
- Complimentary Cumulative Distribution Function (CCDF) curves enables viewing of signal power characteristics



Create custom waveforms faster



Agilent Technologies

Fast, Efficient Custom Waveform Creation

The Agilent 33503A BenchLink Waveform Builder Pro is the first full-featured waveform creation software for waveform generators. The software enables engineers to take full advantage of the signal generation capabilities of the Agilent 33521A, 33522A, 33210A, 33220A, 33250A, 81150A, 81180A Series waveform generators and makes custom waveform creation fast and simple. It is ideal for R&D engineers characterizing new designs and test system engineers validating production units.

BenchLink Waveform Builder Pro is a Microsoft Windows®-based program that provides easy-to-use creation tools, such as an equation editor, waveform math and drawing tools, which can be used to create custom signals. It features a standard function library, waveform sequencer; as well as filters and windowing functions that allow you to easily modify and further refine your waveform. A library of built-in signals supports fast creation of more complex waveforms such as multi-tone, serial data, trapezoid and Gaussian.

With BenchLink Waveform Builder Pro, you gain access to advanced signal creation and editing capabilities, without requiring hours of programming. The result is quicker, easier creation of custom waveforms, coupled with deeper analysis insight into your signals.

Key Applications

- Electronic controls, baseband wire less communications
- Linear amplifiers, DC brushless motors, switching power supplies
- Medical devices, digital audio
- Clock signals, modulation source

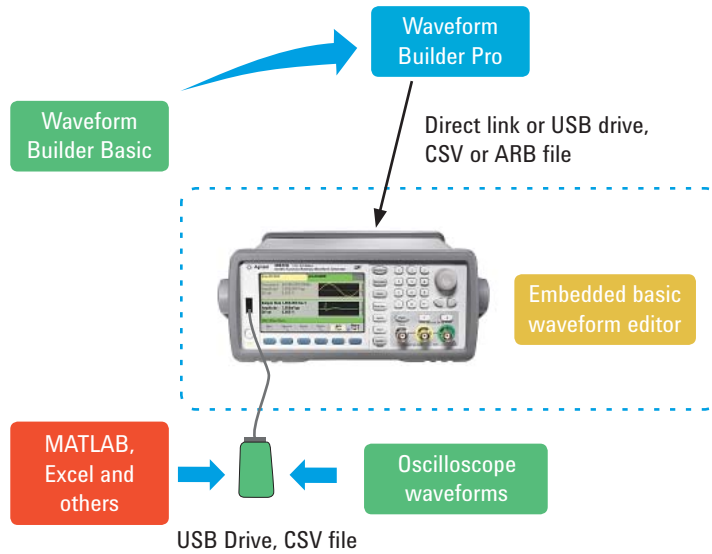


Figure 1. Multiple methods to create and import waveforms into the new 33500 Series.

Exceptional Functionality

The BenchLink Waveform Builder Pro software features a range of functionality designed to make common and custom waveform creation a fast and simple process. This functionality is summarized in Table 1.

Table 1. 33503A BenchLink Waveform Builder Pro functionality.

Category	Description
Waveform Type	
Basic waveforms	DC
	Sine
	Triangle
	Square (with transition)
	Pulse (with transition)
	Ramp
	Noise
	Half-sine
	Line
Advance waveforms	Exponential rise
	Exponential fall
	Noise
	Sinc
	Sweep
	Multi-tone
	Lorentz
	Stair step
	Haversine
	Gaussian
	Logarithmic
	Trapezoid
	Serial data
	Damped oscillation
	Distorted sine
Surge pulse	
Instrument Connectivity	
33521A, 33522A	Set of basic instrument parameters
	Load waveforms or sequences to instrument
	Instrument-based waveform creation and editing
	Import from oscilloscope
	Agilent I/O support
	National Instruments I/O support
81150A, 81180A	Set of basic instrument parameters
	Load waveforms or sequences to instrument
	Instrument-based waveform creation and editing
	Basic instrument parameters
	Import from instrument and load to instrument
	Instrument-based waveform creation and editing

Single-Channel Waveform	
View	Segment markers
	X and Y cursors
	Pin cursors
Edit	Multi-level undo/redo for all basic waveform editing operations
	Paste options such as at beginning, end, cursor, or replacement selection
	Copy/paste options with excel sheet
	Copy/paste options with text file
	Insert options such as at beginning, end, cursor, or replacement selection
	Edit/add/remove waveform points via table
Math	Addition
	Subtraction
	Multiplication
	Math operation with waveform library
	Math operation with constants
	Math operation with clipboard
	Division by constant
Dual-Channel Waveforms	
View	Segment markers
	X and Y cursors
	Pin cursors
	Blinking cursor
Edit	Multi-level undo/redo for all basic waveform editing operations
	Paste options such as at beginning, end, cursor, or replacement selection
	Copy/paste options with Excel sheet
	Copy/paste options with text file
	Insert options such as at beginning, end, cursor, or replacement selection
	Edit/add/remove waveform points via table
Math	Synchronize and un-synchronize editing of dual-channel waveform
	Addition
	Subtraction
	Multiplication
	Math operation with waveform library
	Math operation with constants
	Math operation with clipboard

Sequencing	
	Drag/drop sequence thumbnails
	Sequence editing via grid
	Simple undo/redo support
	Samples information
	Time duration
	Scrolling
	Repeat
33521A, 33522A, 81180A	Create and save sequence
	Send and play sequence
Common Math Operations (Single & Dual-Channel)	
Math	Clip
	Absolute
	Invert
	Mirror
	Resize
	Shift/rotate -> horizontal
	Normalize waveform
	Trim
	Scale
	Re-sampling of waveform (sinc, linear, add points with zero amplitude)
Filters	Low pass (F)
	High pass (F)
	Band pass (F,F)
	Low pass (second order) (F)
	Raised cosine
	Root-raised cosine
	Butterworth
	Chebyshev
	Bessel
	Elliptical
	User FIR (16 coefficients)
Windowing	Hann
	Hamming
	Rectangular (uniform)
	Triangular
	Smooth (circular)
	Gaussian
	Blackman
	Flat top

File Operations (both open and save files)		
File format	Single-channel waveform	Dual-channel waveforms
IntuiLink (.wvf)	✓	✓
CSV (.csv)	✓	✓
Binary	✓	✓
Text (.txt)	✓	
33500 Series ASCII (.arb)	✓	
33500 Series Binary (.barb)	✓	
33500 Series Sequence (.seq)	✓	
81100 Series Sequence (.dseq)	✓	
Dual-channel operation	✓	

Equation Editor

	Build equations to create more advanced waveforms
Arithmetic operators	+ , - , * , / , x^y , (,)
Function library	ABS, ARCTAN, COS, EXP, FACT, LN, NOISE (uniform), NOISE (normal), POINT, SIN, SQRT, STEP, TAN

Common View Operations

View	View individual data points/connect dots
	Panoramic view
	Time scale
	Scrolling
	Flexibility in editing the application display properties
	View FFT of waveform
	View CCDF of waveform
	View constellation (X vs. Y) of waveform
Edit	Set total samples/total time duration/sampling rate
	Freehand draw
	Line draw
	Point draw (with interpolation as linear, smooth, staircase)
Zooming	Horizontal zoom
	Vertical zoom
	Area zoom
	Zoom out
	Zoom with mouse wheel

Waveform Creation Examples



Figure 2. **Arbitrary Waveform Sequences:** Use the Waveform Sequence Tool to create longer custom waveforms by linking multiple waveforms together.

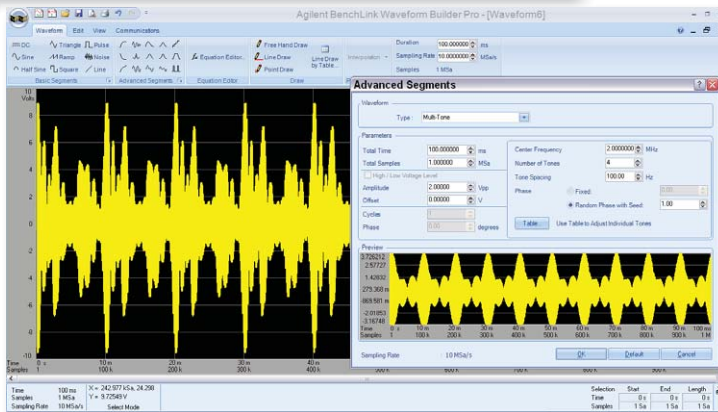


Figure 3. **Multi-tone Signals:** Use the Multi-tone Segment Tool to create a multi-tone signal, up to 64 tones, to analyze a communications device.

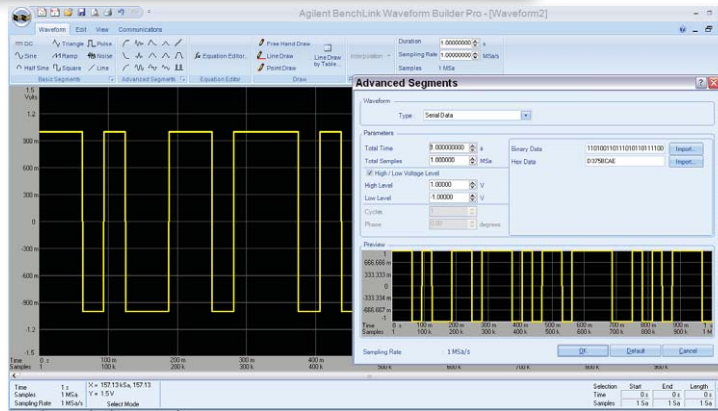


Figure 4. **Serial Data Stream:** Use the Serial Data Segment Tool to create a digital bit stream to simulate the data flow of a serial link in your device.

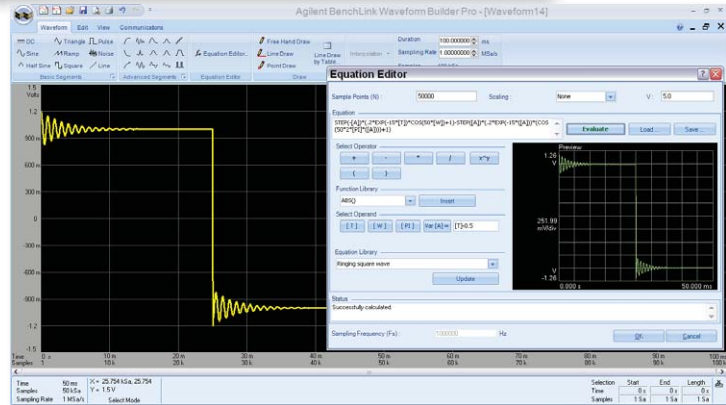


Figure 5. **Equation Editor:** Use the Equation Editor Tool to create more advanced waveforms by writing equations that simulate your specific applications.

Comparing BenchLink Waveform Builder Basic and Waveform Builder Pro

The BenchLink Waveform Builder software is a demo version of the BenchLink Waveform Builder Pro Software. Table 2 provides a comparison of the different functionality available with each version.

Table 2. A comparison of BenchLink Waveform Builder Pro to its demo version BenchLink Waveform Builder Basic.

Features	Waveform Builder Basic	Waveform Builder Pro
Basic waveform library	✓	✓
33200, 33500 Series connectivity	✓	✓
Cut, copy, paste with Excel	✓	✓
Waveform math	✓	✓
Free hand	✓	✓
Line draw	✓	✓
Advanced waveform library		✓
81100 Series connectivity		✓
Equation editor		✓
Point draw		✓
FFT, CCDF, and constellation diagram		✓
Filters		✓
Windowing functions		✓
Dual-channel operation		✓

Supported waveform generators

The BenchLink Waveform Builder Pro software supports the following Agilent waveform generators:

- 33210A, 33220A, 33250A function/arbitrary waveform generators
- 33521A, 33522A function/arbitrary waveform generators
- 81150A, 81180A pulse/function/arbitrary noise generators

Supported interfaces

- USB
- LAN
- GPIB

System and installation requirements

- **Operating system:** Windows 7[®] Pro, Windows Vista[®] (32-bit), Windows XP[®] SP3 (Does not support any Home editions), Enterprise and Ultimate (32-bit)
- **Processor:** Recommend Intel CORETM, Minimum Pentium[®] 5
- **RAM:** Recommend 3 GB or greater. For the 33521A and 33522A models with 16 MSa Arb memory installed, a minimum of 2 GB is required.
- **Disk Space:** Recommend 300 MB, Min 200 MB
- **Display:** 1024x768 resolution, 256 colors
- **PC administrator access:** must login PC with a user password or have administrative access (soft-ware does not run in “guest mode”)
- **Agilent IO Libraries Version 14.1 or later installed on your machine:** The IO libraries are included with instrument on CD or can be downloaded from the ADN web site: www.agilent.com/find/adn
- **33521A, 33522A models:** firmware revision 1.12 or greater

Run-time software components included in the download version

- Microsoft .NET V3.5
- MATLAB Runtime V7.11
- Microsoft Visual Studio[®] Redistributed Runtime v9.0.30729.17

NOTE:

- Software is currently available in the 32-bit version only. Not for use on 64-bit systems.
- This software is fully functional and can be used for 30 days before a software license is required.
- If you need to reinstall the software for any reason on the same PC, the 30-day trial automatically expires even if your 30-day has not been reached.

Ordering options and licensing information

Model number	Product name
33503A	BenchLink Waveform Builder Pro software

1. Order the software and download directly from the Agilent web site for immediate use.
2. Order CD-Rom containing the software from the Agilent web site and it will be shipped to you.

To order your copy or download a free 30-day trial version and start gaining insights into your measurements today, visit www.agilent.com/find/33503.

Related literature

30 MHz Function/Arbitrary Waveform Generators Data Sheet
(33521A, 33522A 1- & 2-channel) literature number 5990-5914EN



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