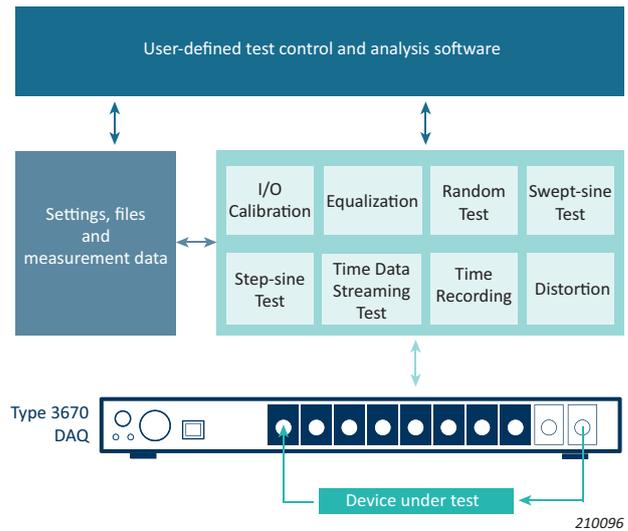


BRÜEL & KJÆR® Electroacoustic Device Testing

Electroacoustic Engine BZ-7852

Electroacoustic (EA) Engine BZ-7852 is an electroacoustic test environment intended to drive Production Test USB DAQ Type 3670 and simplify the measurement of accurate acoustic and vibration data in a production test environment. It can generate final test measurements for further analysis and evaluation, without the need for waveform generation, hardware control or digital signal processing programming experience.

The EA Engine can be operated from the command line or programmatically from popular languages such as C#, MATLAB® or Python® to develop custom user interfaces, and the results can be easily accessed in a range of commercial analysis software as well as Microsoft® Excel®.



Uses

- Test system interface to Type 3670 data acquisition hardware for closed-loop measurements on audio devices. For example, create custom software for:
 - Repetitive testing for production QA for audio devices with multiple built-in microphones and speakers
 - Testing smart devices with voice recognition systems for speech intelligibility and error rates
 - Measuring system linearity and distortion at frequencies up to 40 kHz
 - Recording high-resolution time data from a device under test (DUT) under external excitation for post-processing

Features

- Execute complete and fully calibrated acoustic or vibration tests with a single command
- Build your own electroacoustic application without having to handle hardware control or signal processing issues
- Live-stream waveform data to external devices and measure response on multiple inputs
- Use the EA Engine on any PC as the license resides within Type 3670

Benefits

- Easy-to-use functionality with simple program control and access to results
- Works with standard Windows® operating system
- Small footprint, only 23 MB installation
- Accurate measurements conforming to ISO and IEEE standards

The EA Engine uses standard Windows command line instructions to access all functionality and setup parameters are stored in XML files allowing simple programming and control from almost any programming environment including C#, MATLAB and Python.

Measurement data is stored in XML or MAT files for simple programmatic access or in CSV files for access, analysis and display in Microsoft Excel.

Time data is stored as calibrated data in WAV, HDF5 or MATLAB for easy post-processing in BK Connect® and many third-party applications.

Access to the EA Engine

Functional access to the EA Engine requires licensed firmware in the Type 3670 hardware attached to a local PC.

You can purchase an 8-channel input, 2-channel output version of Type 3670 preconfigured with an EA Engine license by ordering Type 3670-A-082-R. It is also possible to upgrade an unlicensed Type 3670 by ordering Type 3670-UPG and returning the hardware to the HBK service centre.

The EA Engine is only usable with Type 3670 data acquisition hardware.

Specifications – Electroacoustic Engine BZ-7852

Supported Type 3670 modules	Type 3670-A-082-R
Calibration	<ul style="list-style-type: none"> • Input calibration for attached transducers using reference signal levels • Output calibration of attached signal sources using a closed-loop measurement to measure the output level using a reference transducer connected to a calibrated input • Equalization of a source using a reference transducer to measure and define the frequency characteristic of the output. The equalized function can be applied during all closed-loop measurements to linearize the source as a function of frequency
Closed-loop measurements	<ul style="list-style-type: none"> • Random test: Measurements using random noise excitation. The excitation can be band-limited using high- and low-pass filtering, shaped to provide white (flat response in the passband) or pink -6 dB/octave in the passband noise. The output can also be equalized to provide a flat response at the source • Swept-sine test: Measurements using a continuous swept sine excitation. The start and end frequencies can be defined, and the sweep rate can be linear, logarithmic or octave based. The output can also be equalized to provide a flat response at the source • Step-sine test: Measurements using an incremented, steady-state sine excitation where the start and end frequencies are user-selectable and steps can be specified as linear, logarithmic or user-defined. The output can also be equalized to provide a flat response at the source • Waveform streaming test: Measurements based on the response to time data streamed from one or more outputs and response measured at one or more inputs. The output can also be equalized to provide a flat response at the source
Measurement results	<p>Single-channel results:</p> <ul style="list-style-type: none"> • Narrowband spectra • CPB* 1/1-octave, R10 = 1/3-octave, R20 = 1/6-octave, R40 = 1/12-octave, R80 = 1/24-octave • Synthesised CPB* 1/1-octave, R10 = 1/3-octave, R20 = 1/6-octave, R40 = 1/12-octave, R80 = 1/24-octave <p>Cross-channel results:</p> <ul style="list-style-type: none"> • FRF, phase-assigned spectra • THD, Rub & Buzz (available in step sine test only)
Time data recording	<p>Recordings of time data from one or more input channels. Time recordings can be stored in the following formats:</p> <ul style="list-style-type: none"> • WAV: Calibrated 32-bit, multi-channel binary file data that can be accessed by most third-party analysis software • HDF5: Multichannel time data conforming to the HDF5 standard • MATLAB: Specifically aimed at Mathworks® MATLAB users to simplify post-processing functionality in that environment
Result file formats	<p>Processed measurements can be stored in various file formats depending on the user's requirements:</p> <ul style="list-style-type: none"> • CSV: Text file format that is easily imported into third-party software such as Microsoft Excel • XML: Standardized extended markup language that can be easily accessed programmatically for automated post-processing • MATLAB: Specifically aimed at Mathworks MATLAB users to simplify data access for applications developed in that environment
Code Samples	Samples are available at Github/hbk-world . Use Git to clone or fetch as zip file

* Conforms to IEC 61260-1:2014 Class 1, IEC 1260-1995 Class 1 and ANSI S1.11-2004 Class 1

Ordering Information

The EA Engine is only usable with a licensed version of Type 3670 data acquisition hardware. The license may be purchased pre-installed in the hardware or purchased as an upgrade to unlicensed units:

Type 3670-A-082-R Data acquisition hardware with 8 input channels and 2 output channels and preconfigured with a BZ-7852 EA Engine license

Type 3670--UPG Upgrade of Type 3670-A-082 to Type 3670-A-082-R with a BZ-7852 EA Engine License

Contact your local HBK sales representative for more information.



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To learn more about all HBK offerings, please visit hbkworld.com

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