S&V OBSERVER

PULSE – The Engineer's Choice

PULSE continues to be the most popular analyzer in the world – now with more than 8000 systems installed globally. The continued success of this versatile dynamic measurements platform clearly shows that PULSE remains the engineer's choice. Key factors for this success include: measurement accuracy and reliability; the quality of Brüel & Kjær transducers, measurement hardware and application software; and technology innovations behind the platform. The introduction of Dyn-X and REq-X and their unique features has provided users with additional performance.

Dyn-X is a hardware technology offered with state-of-the-art input modules. There is no longer a need to perform an autorange before the measurement, since the hardware supports a dynamic range in excess of 160 dB. This eliminates over and under range errors in the measured data.

Response Equalization (REq-X) is a new technique that allows the frequency response of accelerometers, microphones and couplers to be flattened and stretched in real time. It corrects the output signal of a transducer by the inverse of its calibrated frequency response.

REq-X extends the frequency range in which the transducer can be used and improves the accuracy of the measurement. This means that you can use the same microphone for different sound fields (free field, pressure and random). The microphone frequency response can be corrected for the sound-field angle of incidence and for various microphone accessories (windscreens and nose cones). It provides major benefits when using accelerometers, because the extended frequency range makes it possible to use clip mounting instead of stud mounting in some measurement

situations with the same usable frequency range. This saves significant setup and reconfiguration time. Furthermore, PULSE 12 augments REq-X with phase compensation, allowing the phase of DC accelerometers to be used all the way up to half their mounted resonance frequency.

To ensure value for more than 8000 PULSE customers, B&K has held customer workshops all over the world, gathering input from more than 250 customers. This input has been used to significantly improve workflow support in PULSE – something that will especially benefit new users and postanalysis of already measured data.

Ease of Use. PULSE is widely regarded as the most complete analyzer system on the market. With the enhancements made in PULSE 12, it is easy to use from day one, but advanced enough for most applications. Here are the more salient points:

- The smart-start feature creates the most likely analyses and functions automatically – with all properties accessible via "right click" in the hardware setup table. This allows data acquisition to be started almost immediately after a project is created.
- The front-end browser allows front-end control via a LAN connection without leaving a PULSE project. This is useful if hardware must be changed on the fly or if there are multiple front ends on the same LAN segment.
- Signals can be reconnected in PULSE projects to match any front end by mapping signals across physical inputs and automatically propagating changes throughout a project – no need to set up functions again or make any further changes. This makes projects more independent of specific front ends and is very
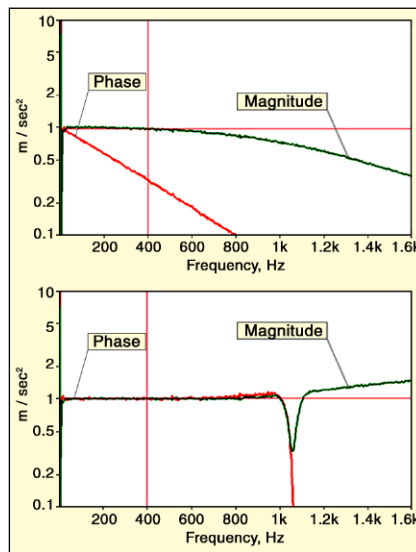
Frequency response of DC accelerometer Type 4574 using REq-X in PULSE 12 – without REq-X (top), with REq-X up to 1 kHz (bottom).

useful when the front-end browser is used to change attached hardware.

Spherical Beam-Forming. This new technology allows a full 360° overview sound field map in confined environments such as a car or aircraft cabin without making any assumptions about the sound field. Spherical beam-forming can be used to make a quick map of the sound field and possibly perform further analysis by using patch holography or conformal mapping applications that can be run on the same system. Data are acquired by placing a sphere at the centre of the measurement area. The sphere has microphones and cameras distributed on the surface, allowing a full 360° × 180° map to be made without knowing the geometry of the measured object.

PULSE Electroacoustics. This application provides very precise methods for measuring fundamental audio performance of an electroacoustic device such as a loudspeaker, a microphone or a headphone using a swept or stepped sinusoidal excitation signal.

New in PULSE 12 is the support for swept sinusoidal excitation using advanced, simulated, free-field time-selective response (TSR). This ensures that measurements performed in an ordinary room give results with the same quality as those made in an anechoic room. Furthermore, the TSR analyzer will produce results faster than most other known simulated free-field methods. For stepped sinusoidal excitation, the unique algorithm used by the steady-state response (SSR) analyzer allows the required accuracy of the result to be set prior to performing the actual measurement.

ASAM-ODS Import and Export. With the addition of support for import and export of ASAM-ODS (Association for Standardisation of Automation and Measuring Systems-Open Data Services) data in PULSE, it is now possible to share data from PULSE with all other applications supporting the industry-standard, open-data environment. Through this new link, it is possible
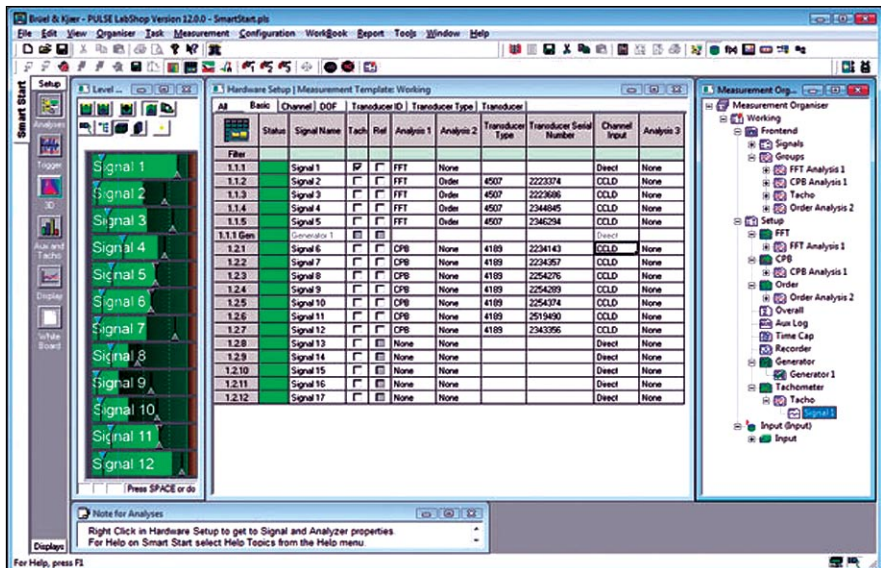
The new smart start template in PULSE 12. All typical analyses can be set up directly through the hardware setup table, making PULSE fast and easy to configure.

to share both function and time data with other ASAM-ODS-compliant applications, making it a very important addition to the already strong import and export functions of PULSE.

Sound Power. The PULSE Sound Power application sports a completely redesigned user interface, with more intuitive interaction and no unnecessary measurement steps. Database support has also been added for both free-field and reverberation room methods.

Structural Dynamics Update. PULSE structural analysis applications and ODS (Operational Deflection Shape) applications are now available through the same framework with improved geometry and animation functions as well as a general speed increase to significantly improve ease of use and intuitiveness. Operational modal analysis now has an automatic modal parameter extraction algorithm that simplifies and speeds up the modal analysis task. This supports more applications by reducing the skill level required to detect proper modes and minimizes human error in proper modes.

NVH Simulator. The NVH simulator has been upgraded with support for an on-road simulator, allowing acoustical evaluations in a roadworthy vehicle. Other new functions include a data preparation tool for extracting both NVH data and vehicle performance characteristics from recordings made on the road or on a test bench and Road Creator, which supports automatic generation of visual scenarios through acquired GPS data.

Please visit www.bksv.com for additional information on PULSE 12 and other Brüel & Kjær products.