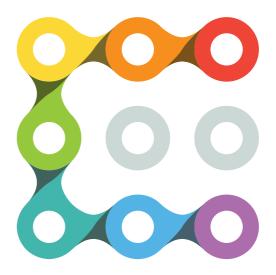# BK CONNECT 2019.0
PULSE 23
HIGHLIGHTS

BK Connect® 2019.0 has been released! To download, go to:

https://www.bksv.com/en/Service/license-management

The installation package includes:
- BK Connect 2019.0
- PULSE™ LabShop version 23
- PULSE™ Operational Modal Analysis version 23
- Team Server (NEW!)

With the BK Connect 2019.0 release, we continue to provide you with the tools to get the job done – with a logical workflow and strong team collaboration. The release's major highlights include:

- NEW PRODUCT! **Team Server:** A data sharing tool that allows individuals to share data across their teams via the network without the need of a database
- **New in BK Connect:**
  - Data Viewer: Client support of the new Team Server; replacement of the Scratchpad Calculator with the new Matrix Calculator and an improved workflow; flexible display grids
  - Hardware Setup: BK Connect now supports CAN bus and auxiliary data as well as LAN-XI-based generator signals
  - Time Data Recorder: Geometry-guided recordings; Time Review task now available to all
  - Data Processing: Simplification of the product structure; further improvements to the operator > test engineer workflow; addition of accept/reject criteria; new Calculation Setup task
  - Structural Dynamics suite: All applications within the suite now provide flexibility in laying out displays and windows
  - Array Analysis: In both Array Analysis Type 8430 and Acoustic Camera Applet Type 8493-A-N-SYS, there is now linear averaging and order mapping
  - Angle Domain Analysis: Support for streamed angular velocity is added as well as two new options for enhancing analysis quality
  - Core applets: Generator support in Types 8490-A, 8490-C and 8490-D, as well as additional analysis options in the Type 8490-D applet
- **New in PULSE LabShop:**
  - NEW APPLICATION! Impulse Noise Evaluation Type 7963 for evaluating firearm noise
  - Updates in Vehicle Pass-by software to support the latest revisions to vehicle pass-by and stationary noise standards and regulations
  - New Experimental Modelling task in PULSE Acoustic Material Testing
  - Targeted enhancements to improve functionality and provide the latest tools and standards compliance
- **New in PULSE Operational Modal Analysis:** A number of features and improvements have been implemented
  - A tabbed SDI user interface style
  - The estimation of uncertainties is now expanded to include mode shape complexities
  - New Modal Alignment view showing simultaneously all three modal parameters as a function of model order
  - Several enhancements to Frequency ODS
  - A number of other enhancements to strengthen our market-leading position within OMA
- **New in Data Acquisition Hardware:**
  - NEW LAN-XI MODULE! LAN-XI Light Type 3677 data acquisition module with 4 input channels and 1 output channel
- **MyBKWorld:** A new annual lease option for BK Connect and PULSE LabShop software
- **Campaigns:** Limited offers exclusively to our M1 customers
  - Hands-on evaluation of structural dynamics software
  - IDAe hardware trade-in

Further Information

To find out more about the latest additions, go to Analysis Applications and Software. Contact your Brüel & Kjær sales representative for product and solutions information as well as for special hardware, software and maintenance offers – including any not mentioned here.

Brüel & Kjær

BEYOND MEASURE

Share data across a team

New Team Server

Brüel & Kjær's new Team Server is a data sharing tool that allows individuals to share data across their teams via the network. No database is required. Data are stored as files in a file repository (the Team Folder). The Server's indexing system indexes the attributes defined through user-definable metadata, making it easier and quicker to query, preview and download query.

Why is this important? Because data has life after the test is complete. You may need to find a set of measurements that you took yesterday, last week or even last year. Normally, a simple request for data can turn into hours of browsing, but with this search capability it can take seconds – even if the data is buried in an old project from years ago. Team Server makes it possible to browse through files to find data without having to explicitly download and import to the local database.

The installation, which is separate from the BK Connect installation, includes the licencing and indexing system. Access to the repository is handled through your BK Connect software interface.

For more information, see the Team Server product data

New in Data Viewer Types 8400, 8400-A, B, C, D and F

Access to the Team Folder

With a connection to a Team Server, a BK Connect client can share any data to the Team Folder (file repository) via the Project Browser. The file's metadata, which is defined in BK Connect, is quickly indexed by the Team Server. All file types supported by BK Connect can be shared, however the .bkc file has more attributes available to be indexed.

To locate data in the Team Folder, BK Connect has added a Team Search tool. Running either a basic search or advanced query language search, you can scroll through the results using BK Connect's tried-and-true Result Matrix and preview it in the Display Manager – before you even download it. Once certain of your selection, you can download the data and perform further analysis as needed.

Flexible display grids

In the User-defined Display task, individual displays can now be dragged and rearranged as necessary – including having an unevenly organized display grid.

Replacement calculator in Data Viewer (advanced) Type 8400-A

There is a replacement for Scratchpad Calculator: Matrix Calculator. The Matrix Calculator features all the same calculation options that were available in the Scratchpad Calculator, just with a completely rethought workflow, based on the Result Matrix. All calculation results are automatically stored to the Project Browser as well as being available in the matrix for viewing or further calculations. Additionally, you can predefine names for the calculated results by setting up a naming strategy for the different function operators.

Enhancements in this release

- In Data Viewer Type 8400: Import and export of 3D CSV files is now supported, which includes analysis vs time and order slices
- In External File Importers Type 8400-C: Import and export of HDF5® file format is now supported, which is the recommended format for MATLAB® software

For more information, see the BK Connect Data Viewer product data

New in Hardware Setup Types 8401, 8401-A and 8401-V

CAN bus and auxiliary channel monitoring and recording

You can now stream CAN bus and auxiliary data using your LAN-XI CAN Bus Module Type 3058-B-080 directly to BK Connect software. To enable, use the new CAN Setup task, where you will select the CAN connector to enable, select and edit the CAN Definition file to use and edit signal parameters. From there you can monitor and record CAN bus data using the SAE J1939, ODBII or specific .dbc file. If you have Sonoscout NVH Recorder (BZ-5950-L-N01 licence), use the Sonoscout CANdidate wizard to generate the .dbc file if you want a faster update rate than what is available via the standard.

All of the information provided about CAN, equally applies to auxiliary data. With a LAN-XI 4-ch. Input/HS-Tacho + 8-ch. Aux. Module Type 3056, you can monitor and record auxiliary signals.

Generator support in Standard Measurement, Time Data Recorder and the Monitor

With at least one output channel enabled, the table in the new Generator Setup task will populate with all the generators available in the test setup. The monitors can be used to verify that the output is set up properly for both frequency content and level before moving to the Time Data Recorder or Standard Measurement task to use the generator. The generator can also be switched on in the Monitor recorder.

Enhancements in this release

- Integration and acoustic weighting options added to real-time monitoring, strengthening your ability to validate data before recording and measuring
- New F10 hotkey functionality in the Hardware Browser to switch on/off the fans on LAN-XI Frame Type 3660
- New column in the monitor selector called Profiles where CAN bus and auxiliary data as well as rpm profiles can be selected. In the resulting Profiles display, the current value is shown in large numbers
- It is now possible to move the monitors to optimize the layout for your given workflow. This gives you the flexibility to prioritize what is shown where on the screen during a test
- Reset of the playback audio level, which is helpful if there is a large transient that makes it difficult to hear the proper level of the test object

For more information, see the BK Connect Hardware Setup product data

New in Time Data Recorder Type 8402

Geometry-guided recordings

Geometry-guided recordings are now possible if you have a Geometry Type 8410 licence and have loaded a geometry and created a DOF sequence in the DOF Setup task. Once configured, the DOF (measurement) sequence will create the appropriate number of tracks in the Time Data Recorder task with the geometry visible to help you rove the transducers to the correct location between recordings. This is helpful in operational modal analysis (OMA) and operating deflection shape (ODS) measurements.

Time Review now available to all

The Time Data Recorder product structure has been consolidated into one type number: Type 8402. With this change, the Time Review task is now available for all Time Data Recorder users.

Enhancements in this release

- You now have the ability to predefine metadata in a text file and load the file before a recording to reduce the risk of error during the test

For more information, see the BK Connect Time Data Recorder product data

Simplification of the product structure

The Data Processing product structure has been consolidated and simplified. Where previously there was a type number for the "operator" role (Type 8403) and two type numbers for the "specialist" role (Type 8404 for setup and Type 8404-A for validation), there are now only two type numbers:

- **Type 8403** – basic software for the operator
- **Type 8403-A** – advanced software on top of Type 8403, for the specialist with both setup and validation functionality

Sub-tasks in Standard Processing Setup task

Process chain creation has now become easier in the Standard Processing Setup. The task now has both Processing Parameter Editor (operator mode) and Process Chain Configuration (specialist mode) sub-tasks. With just a Type 8403 licence, the operator can edit chain element parameter values in the Processing Parameter Editor sub-task, while with a Type 8403-A licence, the specialist can set up the process chain in the Process Chain Configuration sub-task.

This change also means that the specialist can now can more easily review the operator mode, as the interfaces are part of the same task.

Accept or reject measurements

In the Standard Processing task, you can now define accept/reject criteria, using the thumbs up and thumbs down options, allowing you to review the results immediately and decide if the measurement was good or bad. From there, you can repeat the measurement or continue with another task.

Define function calculations

In the new Calculation Setup task, you can define a calculation chain to perform function calculations. You can even export and import process chains as necessary. The chain is then loaded in the Matrix Calculator, BK Connect's central interface to process and perform function math, where you can select the functions and the calculation chain, then execute the chain.

Enhancements in this release

- In Data Processing Type 8403:
  - New automated filtering options in the Standard Processing task to select what data should be shown in the Result Matrix and the Results Selector components
  - Access to the Standard Measurements task for real-time FFT measurement and recording
  - New integration method without the high-pass filter that follows the Simpson method
  - The Overall Analysis element allows you to skip the averaging settling data when set to exponential averaging to help minimize any higher than expected levels at the beginning of a measurement to the averaging artefacts
  - Done Management is now available in all tasks and Source Management is available in relevant tasks, with smart defaults set
  - New default start-up view to reduce the number of tasks shown to the minimum necessary for a Data Processing workflow
- In Data Processing (advanced) Type 8403-A
  - A dedicated Time Editor task allowing you to skip the creation of regions and editing of time data if not necessary
- In Advanced Frequency Analysis Type 8405-B: Added the Bessel filter, which has very light ringing in the step response but a softer roll off than other filter types
- In CPB Option Type 8405-C: All CPB analysis elements offer an option to skip the averaging settling data when set to exponential averaging to help minimize any higher than expected levels at the beginning of a measurement to the averaging artefacts
- In Sound Quality Metrics Option Type 8405-G: Additional frequency resolution options (8 Hz and 16 Hz) in the tonal metric calculations to support backwards compatibility with PULSE Sound Quality Type 7698

For more information, see the BK Connect Data Processing product data

New Structural Dynamics suite features	**Flexible display grids** You can now move and resize the displays and windows in all structural dynamics post-processing applications: ODS Analysis, Modal Analysis and Correlation Analysis. With flexible display grids, you have a very powerful tool for customizing a task's layout according to company standards, personal preferences and actual data. For more information, see the BK Connect Modal Analysis product data for an example
New in Array Analysis	The following new features are implemented in both **Array Analysis Type 8430** and **Acoustic Camera Applet Type 8493-A-N-SYS**: **Linear averaging** During playback, instead of exponential averaging you can now also apply linear averaging to the entire recorded signal, or a portion of it (using the spectrogram to select the region). **Order mapping** If a recording is made together with a tacho signal, then order mapping can be shown with 1 to 100 contiguous orders. **Enhancements in this release** • The minimum calculation distance for beamforming with the Acoustic Camera has been reduced to 15 cm before the algorithm is changed from beamforming to SONAH as beamforming has been shown to work better with a calculation distance down to a factor of 0.4 of the array diameter • The dynamic threshold level in the contour plot can be set to operate above a certain minimum level For more information, see the BK Connect Acoustic Camera and/or BK Connect Acoustic Camera Applet product data
New in Angle Domain Analysis Type 8440	**Streamed angular velocity** Added automatic creation of a high-resolution angular velocity signal, derived from the angle signal that can be analysed just like any other streamed analogue signal such as acceleration or sound pressure. You can then perform high-precision torsional vibration analysis on both stationary and non-stationary signals by taking this signal, together with the other measured signals, into the Data Processing application. **Enhancement of analysis quality** To improve the robustness of cycle extraction, two new correction options have been added: • Outlier detection and correction of the high-speed angle signal • Drift detection and correction when the high-speed angle and reference tachometer signals drift apart For more information, see the BK Connect Angle Domain Analysis product data
New in the core applets Types 8490-A, B, C and D	**Generator support** In **Types 8490-A**, **8490-C** and **8490-D**, with LAN-XI Light Type 3677's output channel enabled, the table in the new Generator Setup task will update with channel information. The Monitor can be used to verify that the output is set up properly for both frequency content and level before moving to the Standard Processing task to start the generator.

Additional analysis properties

In all core applets, more analysis properties have been made editable in the Standard Processing Setup task to give you more flexibility.

Loudness and Overall Analysis Applet Type 8490-D now includes the Articulation Index calculation.

For more information on the various applets, see BK Connect Applets on our website

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New PULSE application to evaluate firearm noise

Impulse Noise Evaluation Type 7963

This software provides accurate measuring and reporting of unsuppressed and suppressed firearms impulse noise in accordance with MIL-STD-1474-D (1997) and MIL-STD-1474-E (2015). A battery-driven system for evaluating firearm noise has been developed based on Type 7963. The complete portable system uses three 1/4-inch microphones for simultaneous measurements at the left and right ear and the muzzle. After each shot, the noise parameters are calculated and displayed immediately. Full documentation of the shooting session is available in a Microsoft® Excel® report.

For more information, see the Impulse Noise Evaluation System product data

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Updates to Vehicle Pass-by Types 7788-G and 7788-V

Comply with current exterior vehicle noise standards and regulations

The following capabilities have been added to keep in line with vehicle exterior noise standards and regulations:

• Implementation of new standards: Minimum noise standards R138, US141 (including draft 8); SAE J986; R41 rev. 4, R51 rev. 03 ASEP and additional amendments
• Compliance with ASEP: Added Reference Sound Assessment (requirement to the ASEP procedure) and possibility to measure P5 and P6
• R51.03 – Update to Amendment 3, where it is required to measure an additional 20 metres to detect 'backfire' after the throttle pedal is released

Other enhancements in this release

• Extended Microsoft® Excel® export using templates, selectable export of spectral data, and export of selected runs only
• Ground-controlled scenario for multi-vehicle setup so the driver can follow the progress in the Driver's Aid in the vehicle
• In horn tests, measure with three microphones simultaneously at different heights – saving time
• It is possible to use ground microphones in a multi-vehicle scenario for stationary measurements (like exhaust, engine and horn noise) instead of using additional microphones in the vehicle. This means only two microphones have to be calibrated (three for minimum noise)
• In Type 7788-G: Now includes PDM components, which means BK Connect Data Viewer Type 8400-A is no longer a prerequisite

For more information, see the PULSE Vehicle Pass-by System product data

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New in PULSE Acoustic Material Testing Type 7758

Experimental modelling

A new task for the Transmission Loss template based on measurements according to ASTM E2611 has been implemented. Using this new Experimental Modelling task, you can calculate normal incidence transmission loss for layered material based measurements of individual layers or calculations of known materials.

Enhancements in this release

• In the absorption templates, you can perform multiple 1/n-octave extractions for a single measured absorption result

For more information, see the Acoustic Material Testing product data

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| Other enhancements in PULSE LabShop | • In the Array Acoustic Suite: |

Other enhancements in PULSE LabShop

- In the Array Acoustic Suite:
  - In **Refined Beamforming BZ-5639**: Improved methods for removing noise in the measured cross-spectral matrices
  - The time to calculate the cross-spectral matrices has been considerably improved
- In **Sound Power Type 7799**: Measurements on a half-cylinder based on Annex D (informative) of ISO 3744 with a top and a bottom surface now possible
- In **Sound Power Determination for Earth-moving Machinery Type 7883**:
  - Trenchers (section A.9 of ISO 6393) have been added
  - Other machine families such as horizontal directional drills (section 3.4 of ISO 6165) and compact tool carriers (section 3.4 of ISO 6165), which are not specifically mentioned in ISO 6393, can be dealt with as a custom machine
- In **Sound Power in Reverberation Rooms Type 7884**: Updated to comply with ISO 3743-2:2018
- In **PULSE Noise Emission Outdoor Machinery, Directive 2000 Type 7885**: Now allows measurements down to 25 Hz
- In **PULSE Sound Power of Fans Type 7886**: Now allows measurements in 1/3-octave bands at >11.2 kHz using ISO 3744 without requiring the ISO 9295-based PULSE High-frequency Sound Power Type 7888. Measurements at frequencies above 11.2 kHz can be made, but with the warning to use an application where ISO 9295 is implemented

New in PULSE Operational Modal Analysis (OMA)

Tabbed user interface style

The default user interface now uses SDI (single document interface), which allows each panel (window) to contain multiple tabbed views at one time. This provides a clear and logical overview, when large amount of information needs to be quickly accessed without changing the screen layout. You can, however, select between the legacy MDI (multiple document interface) and the new SDI user interface style.

Expanded uncertainty calculations

Uncertainty calculations on mode shapes are now available for all three modal parameters: natural frequencies, damping ratios and mode shapes.

Showing the modal parameters as a function of mode

A new Modal Alignment view shows for a selected mode the natural frequency, damping ratio and mode shape complexity as a function of model order, including display of uncertainty confidence band.

Enhancements in this release

- Export of movie files of animations in GIF format in addition to the current AVI format
- Normalization can now also be performed with respect to the real or imaginary axis using a normalization angle slider. This allows for normalization of complex modes to real modes, for example, for correlation with FEA modes
- Frequency ODS enhancements:
  - Results can now be scaled as peak-peak, rms or power in addition to the current peak scaling
  - Shape table results can now be shown in velocity and acceleration in addition to the current displacement
  - Results can now be shown with Imperial units in addition to the current SI units
- A colour map (contour bar) is now available for time ODS and frequency ODS animations with absolute scaled values and units, and for mode shape animations with relative scaled values
- Export of multiple movie files simultaneously is now possible
- A MAC Rejection Level slider is now available in the SVD plots for all the frequency-domain techniques when doing automated mode estimation
- A new "Steel Plate" sample file is included in the installation, which illustrates the analysis of a dual-measurement test, where each measurement contains 8 accelerometers including 2 references. With this file, there is now a total of 9 sample files.

For more information, see the PULSE Operational Modal Analysis product data

New LAN-XI data acquisition hardware

LAN-XI Light Type 3677

The new LAN-XI Light Type 3677, is a stand-alone data acquisition module with four input channels with BNC connectors and a single output channel with BNC. The module has a very rugged industrial design, perfect for use in the field. The four 25.6 kHz dynamic input channels support CCLD transducers and transducers with TEDS (transducer electronic data sheet). The module can also supply 200 V polarization voltage with the optional front plate UA-3102-041.

NOTE: LAN-XI Light (both Types 3676 and 3677) is only supported in BK Connect software.

For more information, see the LAN-XI Light product data

MyBKWorld

A MyBKWorld pack is a self-contained software pack node-locked to a single dongle for one user only. "Self-contained" means that the pack includes all of the prerequisites, application software and support needed to run and perform an application. The software contents are also fixed – no adjustments can be made, nor can licences be split over multiple dongles.

Licences are leased annually. Once the lease runs out and is not renewed, the user will no longer have access to the software and support. If you download the free Data Viewer Type 8400-NT licence, you can view and report the data, but measurements, recording and processing will not be possible.

Contact your local sales representative for more information.

Exclusive offers

Free structural dynamics software trial

Get a free 4-week trial version of any BK Connect Structural Dynamics software, PULSE Operational Modal Analysis (OMA) or PULSE Structural Health Monitoring (SHM) software (including example files) to get an idea of how the software can help you go further in post-processing your structural dynamics data.

For more information on this offer, see Structural dynamics systems for every need on our website

Get hardware to match your software

Brüel & Kjær's legacy IDA^e hardware is no longer supported, starting from BK Connect 2019.0, so now is the time to take advantage of our IDA^e hardware trade-in campaign.

As an IDA^e customer, you can get a substantial trade-in discount when you upgrade to the LAN-XI platform.

For more information on this offer, see IDA-E to LAN-XI Trade-in campaign on our website

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