BK Connect Acoustic Camera Applet Type 8493-A-N-SYS
Including Acoustic Camera Type 9712-W-FEN

BK Connect® Acoustic Camera Applet, together with Acoustic Camera Type 9712-W-FEN, is a complete system for real-time noise source identification (NSI) that can be used for both stationary and non-stationary measurements. It is a versatile tool with applications in many industrial environments. BK Connect Acoustic Camera is equally suited to NSI troubleshooting in the automotive industry and subsuppliers; buzz, squeak, and rattle (BSR) detection in vehicle cabins; and high-frequency leak detection.

Use BK Connect Acoustic Camera Applet to locate and view transient sound sources on site with an aim, shoot and measure procedure. The system allows you to take, save and share screenshots using the functionality of your tablet; make, save, review recordings and videos and complete measurement projects.

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Uses, Benefits, Features

Uses
- NSI on industrial machinery and household appliances
- Detection and documentation of BSR in vehicle cabins
- Leak detection on weather seals, firewalls and cladding
- Event measurement and recording
- Non-stationary measurements: Walk and stream
- Stationary measurements: Mount the array on a tripod

Benefits
- Easy to use, minimal training required
- View measurements on site in real time
- Locate sound sources, take screenshots of problem areas
- Perform both beamforming and acoustic holography measurements with one system
- Capture screen as picture or video for rapid reporting
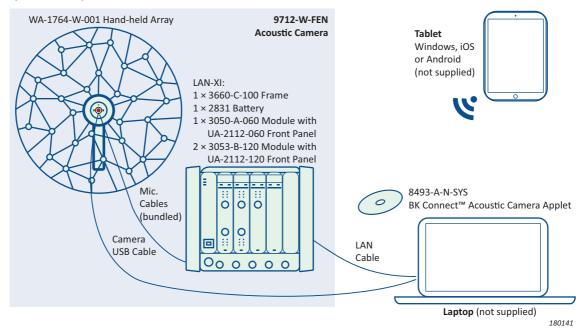- Save and share complete projects for quicker decision-making

Features
- Complete system, includes hardware and software
- Spectrogram displays sound frequencies as a function of time
- Portable, hardware comes in custom-made case
- Battery life of up to 2½ hours
- Source map superimposed on video images
- Software features:
  - Up-and-running in under ten seconds (from BK Connect project menu)
  - Continuous buffering provides real-time images
  - Simple, easy-to-use interface
  - Optional remote control mode via tablet
- Hand-held array features:
  - Small size for use in confined spaces, diameter 35 cm
  - Removable reflective plate allows measuring in either the near or far acoustic field
  - Microphones flush with reflective plate
  - Integrated video camera, films 15 to 20 frames per second
  - Integral cables keep system tidy, mobile, and easy to set up
  - Built-in tablet holder

Brüel & Kjær

BK Connect Acoustic Camera Applet is a portable solution for transient noise detection in almost any acoustic environment. It is capable of stationary and non-stationary measurements in both near and far acoustic fields, and can be used as either a detection tool or a measurement device.

The system consists of a hand-held array, LAN-XI data acquisition hardware BK Connect Acoustic Camera Applet, and a custom-made, waterproof case for transporting the hardware to and from measurement sites.

System Setup

Fig. 1
BK Connect Acoustic Camera system

The Hardware – Acoustic Camera Type 9712-W-FEN

The Hardware – Acoustic Camera Type 9712-W-FEN
Array WA-1764-W-001 is a 30-channel, sliced wheel array with integral cables and a removable reflective plate. It features an integrated handle with a built-in tablet holder. In the centre of the array is a video camera that films 15 to 20 frames per second. All necessary LAN-XI modules are included in the configuration.

The Software – BK Connect Acoustic Camera Applet Type 8493-A-N-SYS
The applet is Windows®-based analysis software that is delivered via DVD or USB. Licences are node-locked to a PC host ID or dongle. The software is up-and-running in under ten seconds and immediately connects to the Acoustic Camera hardware configuration. After that, the system is ready to stream, record and play back. Streaming is the default operating mode and is perfect for troubleshooting. In this mode, you can locate a sound source, save a screenshot and/or video, and identify and fix the noise issue with no post-processing necessary.
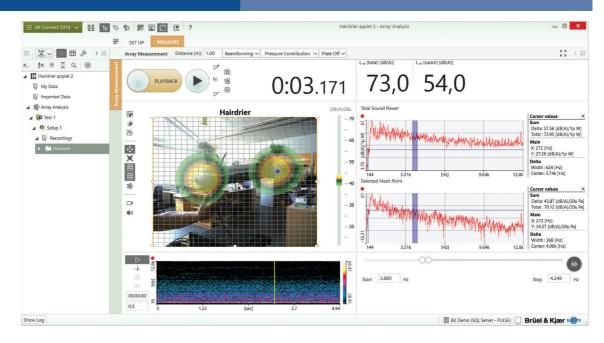
A recording can be made and saved directly in the software for further analysis. You can record multiple areas of interest since each recording is automatically stored separately.

Playback mode allows you to view your recordings immediately, enabling you to determine whether another recording is necessary or to investigate the sound source further. You can adjust the frequency range during playback.

User Interface
The applet features the same ease-of-use achieved through BK Connect's innovative graphical user interface (GUI) and logical workflow. View sound pressure (or sound intensity), sound power, and a spectrogram as you measure and record, and edit the displays as needed. The sound power display is interactive in either streaming or playback mode and can be used to view a specific frequency (or a range of frequencies). The spectrogram is only interactive during playback. To pinpoint sound events, use the cursor and zoom in on selected regions and loop the playback.

Fig. 2
Graphical user interface of BK Connect Acoustic Camera Applet. The interface has been refined to view and edit data easily using a PC or tablet

Using a Tablet

With a wireless connection, the user interface can be displayed on a tablet running Windows®, iOS®, or Android™ operating system[*] enabling remote control of the system from the tablet. This features makes it possible for one person to operate the entire system.

Microphone Calibration

On-site microphone verification can be preformed using Sound Calibrator Type 4231 and Single-channel Array Adapter WA-0728-W-006. If needed, factory standard calibration is also available.

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[*] Requires software for remote support, such as TeamViewer or similar. Commercial use of TeamViewer requires a license.

Compliance to Standards

The hand-held array and LAN-XI hardware comply to the following standards:

SAFETY
EN/IEC 61010-1 and ANSI/UL 61010-1

EMC EMISSION
- EN/IEC 61000-6-3: Array and LAN-XI modules
- EN/IEC 61000-6-4: Array and LAN-XI frame
- CISPR 22, Class A: LAN-XI frame
- CISPR 22, Class B: Array and LAN-XI modules
- FCC Rules, Part 15: Limits for a Class B digital device: Array
- ISM device complies with Canadian ICES−001: Array

EMC IMMUNITY
- EN/IEC 61000-6-1: Array and LAN-XI modules
- EN/IEC 61000-6-2: Array and LAN-XI modules
- EN 61000-4-2 at ±4 kV air discharge: LAN-XI frame
- EN 61000-4-5 surge 1.5 kV line-earth: LAN-XI frame
- EN/IEC 61326: Array and all LAN-XI hardware

All LAN-XI modules live up to the ±4 kV and ±8 kV ESD discharge requirements, with temporary loss of function that is self-recoverable or restored by operation of the controls.
The above is only guaranteed using accessories listed in this document

ENVIRONMENTAL
All hardware:
- IEC 60068-2-1 & IEC 60068-2-2
  Operating Temperature: −10 to +55 °C (14 to 131 °F)
  Storage Temperature: −25 to +70 °C (−13 to +158 °F)
- IEC 60068-2-78: Damp Heat: 93% RH (non-condensing at 40 °C (104 °F))

MECHANICAL
Non-operating:
- IEC 60068-2-6: Vibration: 0.3 mm, 20 m/s^2, 10 – 500 Hz: All hardware
- IEC 60068-2-27: Shock: 1000 m/s^2: All hardware
- IEC 60068-2-29: Bump: 1000 bumps at 250 m/s^2: Array, LAN-XI modules and an empty LAN-XI frame
- IEC 60068-2-29: Bump: 1000 bumps at 150 m/s^2: LAN-XI frame loaded with modules

IEC 60529 PROTECTION PROVIDED BY ENCLOSURES
- IP 20: LAN-XI frame
- IP 31: LAN-XI modules

System

SYSTEM REQUIREMENTS

- Microsoft® Windows® 10 Pro or Enterprise (x64) with either Current Branch (CB) or Current Branch for Business (CBB) servicing model
- Microsoft® Office 2016 (x32 or x64) or Office 2019 (x32 or x64)
- Microsoft® SQL Server® 2017 or SQL Server® 2019

NOTE: Microsoft SQL Server 2017 is included in BK Connect installation

MINIMUM PC

- Intel® Core™ i7, 3 GHz processor or better
- 32 GB RAM
- 480 GB Solid State Drive (SSD) with 20 GB free space, or better
- 1 Gbit Ethernet network[*]
- Microsoft® Windows® 10 Pro or Enterprise (x64) with CB
- Microsoft® Office 2016 (x32)
- Microsoft® SQL Server® 2017
- Screen resolution of 1920 × 1080 pixels (full HD)

TABLET REQUIREMENTS

Operating System: Windows®, iOS®, or Android™
Recommended Size: 20 × 13 cm (8 × 5 in)
Remote Control/Display Requirement: TeamViewer or similar

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[*] A dedicated data acquisition network (LAN or WAN) is recommended. A network that only handles data from the front end improves the stability of the data

Acoustic Camera Type 9712-W-FEN

HAND-HELD ARRAY WA-1764-W-001[†]

Frequency Range: 140 Hz to 12 kHz
- Near field, without reflective plate (SONAH): 140 Hz to 3 kHz
- Far field, with reflective plate (beamforming): 1 kHz to 12 kHz[‡]

Weight: 1 kg (2.2 lb)
Diameter: 35 cm (13.8 in)
Number of Microphones: 30
Camera:
- Frame rate: 15 per second
- Pixels: 1280 × 1040
- Angle of view: 76°

WATERPROOF STORM CASE

Dimensions: 60 × 34 × 64 cm (24.6 × 13.4 × 25.2 in)
Weight (hardware and case): 22 kg (48.5 lb)

FRONT END

LAN-XI data acquisition hardware including battery module
Battery Life: 2½ hours
Full specifications given in product data BP 2215

BK Connect Acoustic Camera Applet Type 8493-A-N-SYS

MEASUREMENTS

Analysis (Narrow band): 1/1-, 1/3-, 1/12-octave
Acoustical Weighting: Linear, A, C
Time Constant (Exponential): 1/8 s (fast), 1 s (slow), 8 s

[†] Specifications for maximum side lobe (MSL) of at least 7 dB
[‡] Frequency range can be extended up to 20 kHz with reduced MSL

Ordering Information

Type 8493-A-N-SYS **BK Connect Acoustic Camera Applet**
Type 9712-W-FEN **Acoustic Camera**
Type 9712-W-FEN includes:
- WA-1764-W-001: 30-ch. Hand-held Array
  - 1 × Array Frame with handle, integral cable and tablet stand
  - 1 × Camera
  - 30 × Type 4959: Short 20 kHz Array Microphone
  - 1 × Reflective Plate
  - 1 × WE-0313: Storm Case
  - WA-0728-W-006: Single Channel Array Adapter for Type 4231
- LAN-XI Data Acquisition System
  - 1 × Type 3660-C-100: 5-module Front-end Frame with GPS
  - 1 × Type 3050-A-060: 6-ch. Input Module, 51.2 kHz (Mic, CCLD, V)
  - 2 × Type 3053-B-120: 12-ch. Input Module, 25.6 kHz (CCLD, V)
  - 1 × UA-2112-060: Detachable Front Panel, 6-ch. mic. array, 1 × circular 7-pin (F) connector
  - 2 × UA-2112-120: Detachable Front Panel, 12-ch. mic. array, 2 × circular 7-pin (F) connectors
  - 1 × Type 2831: Battery Module for LAN-XI

SOFTWARE MAINTENANCE AND SUPPORT (REQUIRED)

M1-8493-A-N-SYS   Software Maintenance and Support Agreement for BK Connect Acoustic Camera Applet

Supported Accessories

HARDWARE
UA-0750	Tripod with ball head, 40 to 131 cm (15.7 to 51.6 in)
Type 4231	Sound Calibrator

Calibration Services

ANA-LNXI-CAF	Accredited Calibration of LAN-XI Modules
WA-1764-W-001-TCF	Standard Factory Calibration of WA-1764-W-001, includes calibration and TEDS update of 30 × Array Microphone Type 4959, and a (BK Connect Acoustic Camera) system test

Other BK Connect Products

For an overview of all BK Connect applications and applets, visit the BK Connect page on the Brüel & Kjær website.
NOTE: Applets cannot be upgraded to full-version applications or added to other applets

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