Brüel & Kjær

Sonoscout™ is an intuitive mobile device app[*] that combines with a wireless data acquisition unit to form a complete and highly portable system for quick recordings and immediate measurement validation during NVH testing.

Measurements are controlled on your Apple® iPad® tablet and a simple user interface lets you mark events and replay time histories promptly after recording.

This setup guide will help you get started using your Sonoscout NVH Recorder.

Apple support information

To find out more about using apps on your tablet, check out the following websites:
- support.apple.com/ipad
- help.apple.com/ipad/10

WHAT IS IN THIS GUIDE?

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[*] Sonoscout is compatible with iPad 4, or later, running iOS 10, or later.

WHAT IS IN SONOSCOUT?

The Sonoscout app is available for download via the App Store[SM] or iTunes®. To record sound and vibration data with the app, you need to have the following LAN-XI hardware: an input module, a battery module and a wireless LAN frame. You will also need a Sonoscout licence.

You can use your pre-existing LAN-XI module and add Sonoscout Licence BZ-5950-L and Wireless LAN Frame Type 3660-A-200 or acquire a Sonoscout Kit, which includes all of the above inventory in one portable case.

130216/1

The system is pre-configured (including Sonoscout Licence BZ-5950-L) and ready to use. Simply set up your tablet and Sonoscout app.

Inside a Sonoscout Kit case

1) LAN-XI Battery Module Type 2831-A (including mains charger)
2) LAN-XI input module (4-, 6-, 8- or 12-channel module) with licence
3) 1-module Wireless LAN Frame Type 3660-A-200
4) Car Utility Socket Cable AO-0546
5) Compartments for all system accessories, such as the tablet

NOTE: *Sonoscout Kits are not delivered with tablets.*

Recommended accessories

Available from Brüel & Kjær
- LAN-XI Notar BZ-7848-A: To record data to an SD card
- Apple iPad UL-1029
- Sound Calibrator Type 4231: To calibrate acoustic transducers
- Calibration Exciter Type 4294: To calibrate vibration transducers
- Sound Quality HATS Type 4100-D: For sound quality testing
- Binaural Recording Headset Type 4965-B: For real-time audio
- 4-channel CAN-to-Analogue Converter ZH-0700
- Transducers (as required)

Available from third parties
- Suction Mount: To attach the tablet to a car windscreen
- Cradle for the tablet

Both are available from RAM Mounts® (www.rammount.com)

SETUP BASICS

1 Configure your front end.*

2 Connect your transducer.

3 Power up your front end.

4 Install your Sonoscout licence.*

5 Download the Sonoscout app.
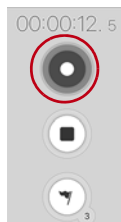
6 Set up your Wi-Fi® connection.

7 Start the application.

8 Make a recording.

*   This step is not necessary if you have purchased Sonoscout Kit Type 3663-A-040, 3663-A-060, 3663-B-080 or 3663-B-120.

CONFIGURE YOUR FRONT END

Front-end configuration is only needed if you purchased your LAN-XI hardware separately (if you did not purchase a Sonoscout Kit).

What do you need?

1) LAN-XI Wireless LAN Frame Type 3660-A-200: referred to as the 'frame'

2) Battery Module Type 2831-A: referred to as the 'battery'

3) LAN-XI Module: referred to as the 'input module'

4) An SD card if using LAN-XI Notar BZ-7848-A

NOTE: Type 3660 must have firmware version 2.1.0.190 or later to use the Sonoscout app. All pre-configured systems have the correct firmware installed.
If you are using an earlier firmware version, please see "Updating Front-end Firmware" on page 17 for instructions.
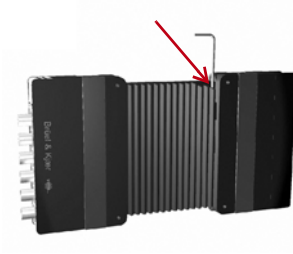
What do you do?

Front-end configuration is a 2-step process:

Step 1: Connect the input module to the battery[*].
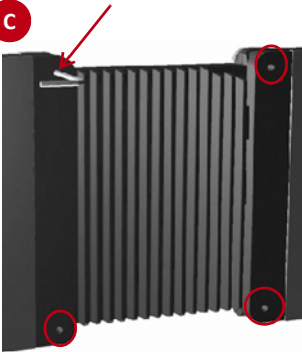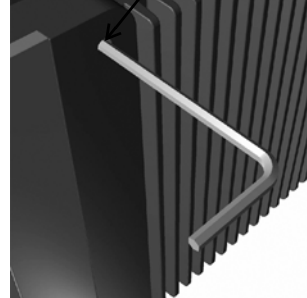
Step 2: Connect the frame.

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[*] If you have LAN-XI Notar BZ-7848-A, you may need to insert the SD card before connecting the frame. Normally, this is done at the factory.
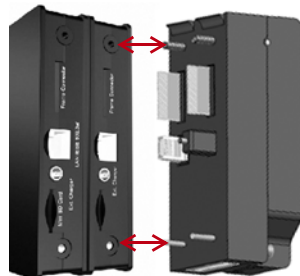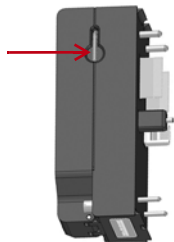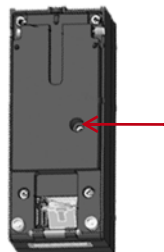
Front-end Configuration Step 1:
Connect the Input Module to the Battery

The battery provides mobile power to the front end during recording.

A) Place the battery 'next to' the input module so that the type number on both modules is facing the same direction, and the battery is to the left of the module (when viewed from the front).

B) Remove the hex key from the input module.

C) Using the hex key, push out the four spring-loaded screws around the input module.

D) Using the screws, fasten the input module to the battery and place the hex key back into place.

E

F

G

H

Front-end Configuration Step 2: Connect the Frame

E) If you have LAN-XI Notar BZ-7848-A, ensure that the memory card is inserted in the mini-SD slot at the back of the input module[*].

F) Align the prongs on the frame with the holes at the back of the assembled input module and battery unit. Insert carefully.

Magnets hold the frame into place. To ensure connection during use, you should screw the frame securely into place.

G) At the side of the frame is a hex key, remove it and pull open the frame.

H) Using the hex key, turn the captive screw in the middle of the frame until it is tightened.
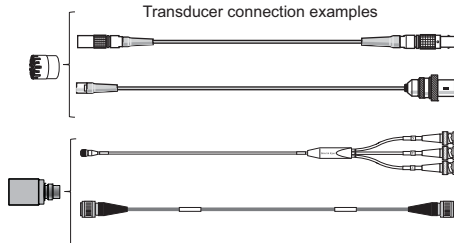
I) Close the frame and place the hex key back into place.

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[*] Use of an SD card is not mandatory. You can also stream recorded data directly to your tablet's internal storage.

CONNECT YOUR TRANSDUCER

Transducer connection examples

LEMO

BNC

SMB

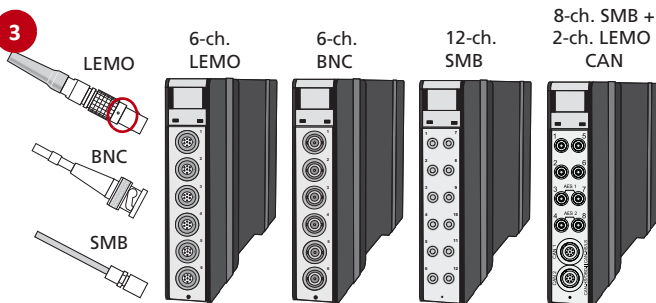6-ch. LEMO

6-ch. BNC

12-ch. SMB

8-ch. SMB + 2-ch. LEMO CAN

Microphones, accelerometers or any other voltage input[*] can be used. LEMO, BNC and SMB connections are supported – all depending on your input module's front panel.

When connecting the transducer, do it gently to avoid damaging threads. In the case of microphones, make sure that you do not touch the diaphragm with anything as it is very delicate.

1) Assemble your microphone cartridge and preamplifier, if not already assembled.

2) Connect the relevant cabling (plus adapter, if necessary) to your transducer.

3) Connect the cable to your front end.

NOTE: *If you are using a LEMO connector, align the red dot at the cable end with the red dot on the front-end connector.*

Connector compatibility

• BNC connectors are compatible with any RG58 5 Ω cable

• LEMO connectors are LEMO 1B – use a Brüel & Kjær cable:
  – LEMO 0B to LEMO 1B Connector Cable AO-0419
  – LEMO 1B to LEMO 1B Extension Cable AO-0414

• SMB connectors are compatible with RF/Coax SMB connectors such as Farnell® 1212896/Tyco Electronics® 1-1337475-0

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[*] For CAN data support, use 4-channel CAN to Analogue Converter ZH-0700

7

POWER UP YOUR FRONT END

Power up the front end by moving the power switch on the battery to **Active**. The input module's display will initially show an IP address of 0.0.0.0. LAN-XI input modules are pre-configured for dynamic IP addressing using dynamic host configuration protocol (DHCP). After activation, the DHCP server in the built-in router will provide an IP address.

Setting your module to use static IP addressing

For wireless communication with Sonoscout, it is recommended to use static IP addressing.

NOTE: Sonoscout kits are pre-configured to use a static IP address.

To assign the module a static IP address, first connect the input module to your computer, either directly or through a DHCP network. Open the input module's web page by typing the IP address from the front of the input module into a web browser, and follow these steps:

1) Click **Network**.
2) Select **Static**.
3) Enter an IP address, and, if necessary, a mask and gateway[*].
4) Click **Save changes**.

The module now has a static IP address.

Alternatively, use the BK Connect® Front-end Setup program, which works also if the current IP address is not within the existing address range.

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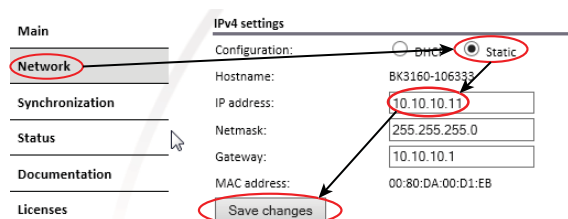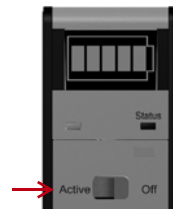
[*] For Sonoscout, use: an IP address in the range 192.168.1.2 to 192.168.1.99, a subnet mask of 255.255.255.0 and no gateway

Resetting your module to use DHCP (dynamic IP addressing)

If you are using an input module that has been previously set to a static IP address, you can reset the module to use DHCP:

1) Press and release the **Control** button at the front of the input module to display the menu.
2) Scroll down the menu by pressing the button once for each menu item.
3) Stop scrolling at **LAN Reset**. Press and hold the **Control** button for 5 seconds.

NOTE: *You can also use the display menu to check the module's firmware version. Simply scroll down to **Module Info** in the menu and press and hold the **Control** button until the display changes. If the "Ver." is earlier than 2.1.0.190, then you must update the firmware. See page 16 for update instructions.*
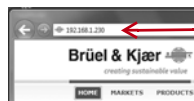

Press Control to scroll   Hold 5 seconds
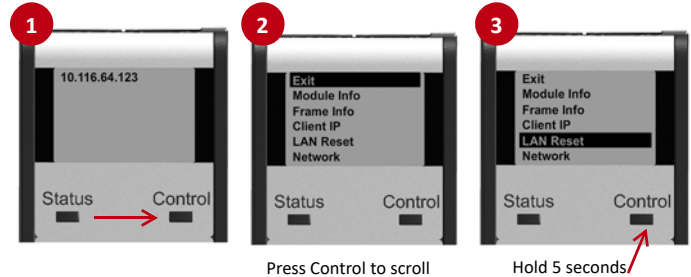
INSTALL YOUR SONOSCOUT LICENCE

Licence installation is only needed if you did not purchase a Sonoscout Kit.

What do you need?

- Licence text file (saved on a USB stick, a PC or tablet)
- Wireless device with web browser
- Password for your front end

What do you do?

1) Enable your wireless device for wireless network/Wi-Fi connection. From the available wireless/Wi-Fi networks, select the **BK3660A-xxxxxx**[*] access point. The access point is a secure network using WPA2-PSK and requires a key (password). Enter **3660xxxxxx**[*].

2) Open a web browser and from the front end's display, enter the displayed IP address in the browser's address line (for example: *192.168.1.229*) and press **<Enter>**. The front end's unique web page will open.

3) Click **Licences** in the side menu.

4) Open the licence text file and copy the licence string.

5) Paste it into the *Licence key(s)* box on the web page and click **Add**.

The following licences will be added for correct operation of Sonoscout:
- BZ-5950 (Sonoscout)
- BZ-5951 (LAN-XI input channel streaming)
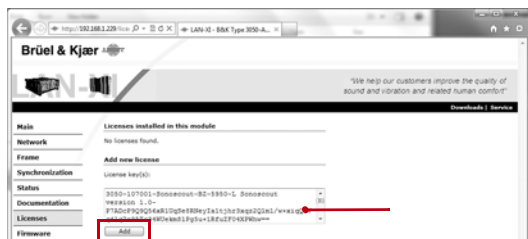- BZ-7848-A (LAN-XI Notar, if installed)

[*] xxxxxx are the last six digits in the front end's serial number

DOWNLOAD THE SONOSCOUT APP

To download the app, you must be connected to the Internet and have an Apple ID. See your tablet's user manual or the Apple website (http://appleid.apple.com) for information on Apple IDs.

NOTE: *The Sonoscout app is free of charge.*

Download directly on your tablet
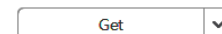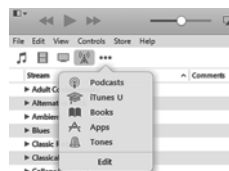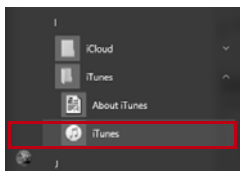
1 On your tablet's Home screen, tap the App Store icon.

2 With the App Store open, tap in the Search field and enter **Sonoscout**.

3 Tap **<Search>** on the keyboard.

4 After the Sonoscout app is displayed, tap **GET**, then tap **INSTALL**.
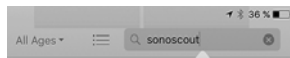
Download via iTunes (for example, on a remote PC)

You can download the app on your PC and synchronize your mobile device to your iTunes library over Wi-Fi. If it is not, see **Settings** > **General** > **iTunes Wi-Fi Sync** on your tablet for instructions.

1 Start iTunes on the PC.

2 On the toolbar click ⊞⊞⊞ and select **Apps** from the drop-down menu.

3 Click **App Store** in the toolbar to open it, then enter **Sonoscout** in the Search field.

4 After the Sonoscout app is displayed, click **GET** to download the app.
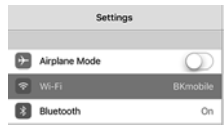
SET UP THE WI-FI CONNECTION

Connect your tablet with the Sonoscout system network.

1

2

3
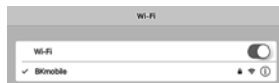
4
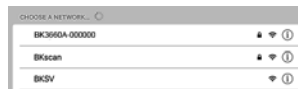
5

1) On your tablet's Home screen, tap the **Settings** icon.

2) Select **Wi-Fi**.

3) If the Wi-Fi connection is switched off, switch it back on.

4) Under *Choose a Network...* all available Wi-Fi networks are listed. Select the Sonoscout system's access point, called **BK3660A-xxxxxx**[*].

5) The access point is a secure network using WPA2-PSK and requires a key (password). Enter **3660xxxxxx**[*].

NOTE: *The Sonoscout system network is a closed, secure network. Once connected, you will not be able to access the Internet.*

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[*] xxxxxx is the front end's serial number

START USING THE APP

1

2

Swipe tab >>

3

4

5

Start the app

1) On the Home screen, select the Sonoscout app icon.
   The application will start and open in the Recording task – see the bottom of the user interface for the task icon ●● .
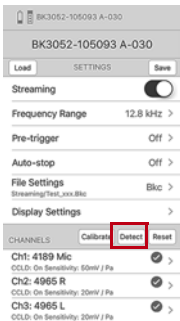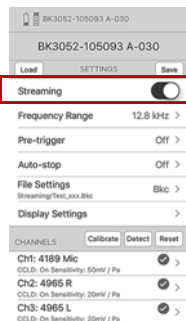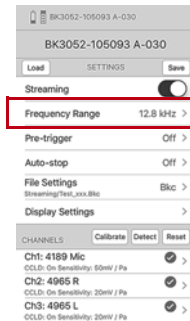   Recording

NOTE: If the app has not detected the front end, the status line will be blank.

Set up the hardware and recording

2) From the left edge of the screen, swipe to the right to open the **Settings** menu and set up the hardware (all front end channels will have default settings).

3) If you have TEDS transducers connected, tap **Detect** and the app will automatically fill in the details.

*NOTE: Tap ? at the top of the user interface and select **Help** for instructions on setting up the hardware manually. Manual setup is necessary with LAN-XI Notar as it does not currently support all TEDS transducers.*

4) Select the recording file location:
   – Save to the SD card in the front end[*]: tap **Streaming** to Off
   – Save to your tablet: keep **Streaming** set to On (default)

5) Set the **Frequency Range**. Data are sampled at 2.56 times this frequency. The default is 25.6 kHz.

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[*] Only available when used with LAN-XI Notar BZ-7848-A
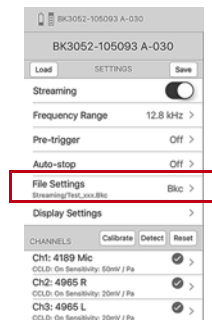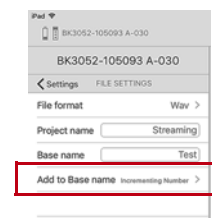
6) Navigate to **File Settings > File Format** and select a recording format:
   – .wav: Wave file (default)
   – .hdf: Hierarchical data format
   – .pti: PULSE Time file
   – .bkc: Brüel & Kjær common file

7) Enter a **Project name** and **Base name**.
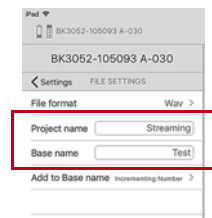   – **Project name:** The name of the folder where the file will be written. The default is "Streaming".
   – **Base name:** File name used for all recorded files. The default is "Test".

8) In **Add to Base name**, define the text that is added to the Base name to give each recording a unique file name.

9) Swipe to close the Settings menu. You are now ready to start a recording.

10) Tap the Pre-recording button to initialize the system. There is a short delay whilst the front end is configured:
   – The enabled channels on the front end will light up green
   – The time counter will light up (showing 00:00:00.0)
   – The Peak Level Meter will display green bars
   – The Level History display will initiate
   – If you are streaming data, data streaming starts immediately

MAKE A RECORDING

Channel selection

Test_074.wav   Driver Left 1
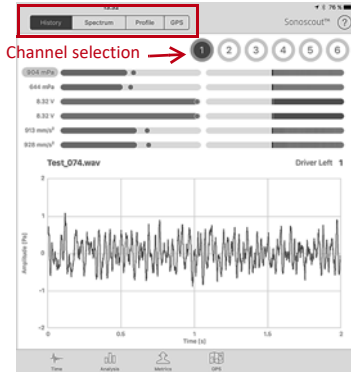
1) Tap the **Rec** button. The button flashes and recording starts immediately.

2) To view real-time displays, use the sub-task tabs at the top of the interface.

   – Tap the **History** tab and select the channel for a history display.

   – Tap the **Spectrum** tab (and channel) for a spectrum display.

   – Tap the **Profile** tab (and channel) for an rpm profile display.

   – Tap the **GPS** tab* (and channel) for a speed profile. (To view the route, tap on the GPS task at the bottom.)

3) To pause the recording, tap the **Rec** button. The button will change to a pause icon. To restart, tap the **Pause** icon. The recording will continue and the data will be attached to the same file.

4) To stop the recording, tap the **Stop** button. There will be a short delay before file writing is complete.

5) If you are streaming data, streaming will continue until you tap the **Stop Streaming** button.

For detailed instructions on use of the app, including user interface descriptions, in-depth setup instructions and file handling and display tips, simply tap **?** at the top of the screen and select **Help**.

Tap to pause

Tap to restart

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* Only available for iPad with the 'Cell Option'.

START USING CAN DATA[*]
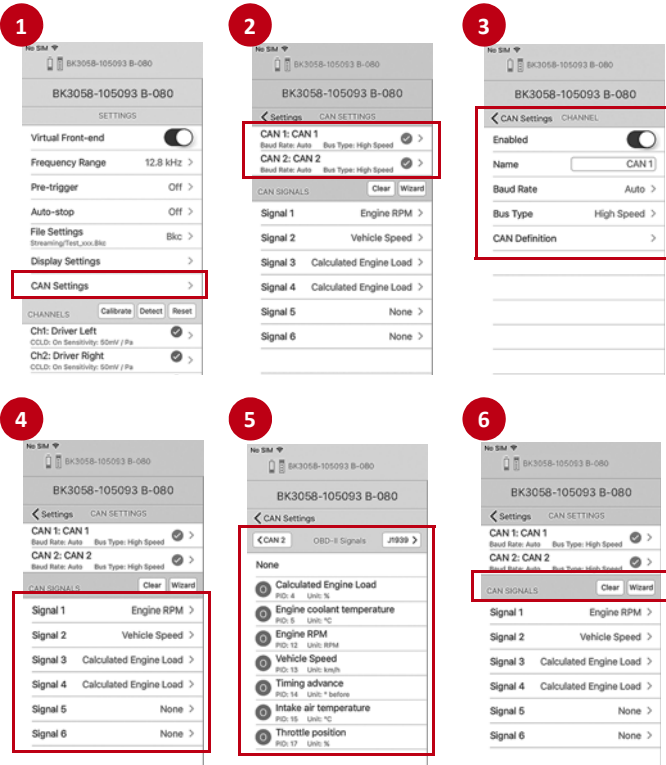
Set up and view CAN signals

1) Open the **Settings** menu, then select **CAN Settings**.

2) The two CAN channels are visible under **CAN Settings**, the green tick icon signifies that the channel is enabled. The baud rate and bus type are also displayed.

3) To edit the settings, tap the arrow to the right of the tick icon to access the **Channel** panel.

4) Assign CAN signals to a monitor channel (up to six available). Click on the arrow to the right of the signal name to access the **CAN Signals** panel.

5) In the **Signals** panel you can select which input connector/adapter you are using (CAN 1, CAN 2, OBD-II or J-1939) and then assign the signal to a monitor channel. Use the two buttons at the top of the **Signals** panel to toggle between CAN inputs.
   The icon to the left of the signal name signifies whether the signal is from the CAN connector ('C'), the OBD-II connector ('O'), or the J-1939 connector ('J').

6) Using the two buttons at the top of the **CAN Signals** panel, you can also:

   – Clear all the signals in the CAN Signals list

   – Open the CANdidate Wizard – this allows you to identify the CAN-messaged IDs of CAN engine rpm, vehicle speed and throttle position signals for monitoring and recording

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[*] Only available when you are using LAN-XI Module Type 3058, with 2-ch. CAN LAN-XI front panel

UPDATING FRONT-END FIRMWARE

Brüel & Kjær continually updates LAN-XI firmware and provides the updates in zip files on the Brüel & Kjær website (www.bksv.com). Once the file is downloaded from the Internet, install the update via the front end's home page.

To download and install firmware updates, you must use a PC.

NOTE: Apple Safari® and iOS systems do not support zip files.

Step 1: Download the Firmware Update

A) Go to www.bksv.com.

B) Select **Services** > **Downloads**.

C) In the list of software downloads, select **LAN-XI**.

D) Click on **LAN-XI Software Updates**.

E) Click the latest firmware filename and **Save** the zip file to any location on your PC.

Step 2: Install the Firmware Update

F) Connect the PC to the front end's wireless access point.

G) Open a web browser and enter the IP address from the front end's display into the address line.

H) On your front end's home page, click **Firmware**.

I) Click **Browse...** and navigate to the saved file.

J) Click **Start update**.

USING THE FRONT END HOME PAGE

Each LAN-XI module and frame has its own home page containing information about the module, including configuration, calibration history, self-test, log file, etc.

To access the home page:

1) With your tablet connected to the front end's access point, open a web browser.

2) Enter the IP address shown in the front end's display into the browser's address line, (for example: *192.168.1.229*).
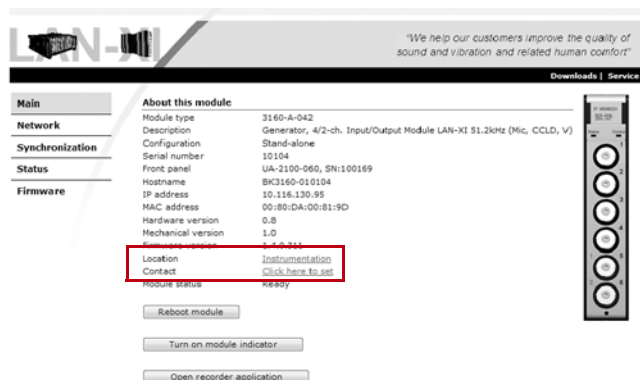
The **Main** page looks similar to the one shown here with the front end's general settings. The two links on the page can be set as needed:

- **Location:** Where the module is physically located
- **Contact:** Who to contact, either an email address or phone number

The buttons at the bottom provide the following functionality:

- **Reboot module:** Reboot the module to factory settings
- **Turn on module indicator:** Enables the module's LED indicators to light up in the case of multi-module configurations (not relevant for single stand-alone modules)
- **Open recorder application:** Use this button to control a recording using LAN-XI Notar and/or access the data stored on the SD card

1

Main
Network
Synchronization
Status
Firmware

Network settings

Configuration: ◉ DHCP
                ○ Static
Hostname: BK3160-010104
IP address: 10.116.130.95
Netmask: 255.255.0.0
Gateway: 10.116.0.12
MAC address: 00:80:DA:00:81:9D

[Save changes]

DHCP

Lease obtained: Tue, 1 Dec 2009 13:18:14 UTC
Lease expires: Sat, 5 Dec 2009 13:18:14 UTC

[Renew] [Release]

2

Main
Network
Synchronization
Status
Firmware

Synchronization

Synchronization method   Module standalo
                                Frame standalone/
                                Frame PTP master/
                                Frame IDAe maste
                                Frame IDAe and P

PTP
Current PTP time   1970-01-01 00:07)
Subdomain name
Current grandmaster   00:80:DA:00:81:9
Grandmaster traceability to UTC DFLT
Parent clock   00:80:DA:00:81:9
Preferred master   No
Sync interval   1.0 s
Mode   Undefined
Slave Offset to Master   0.0 ns
Slave time standard deviation   0.0 ns

LAN Switch
Switch method   Unknown
Switch latency   0

IDAe
Subdomain
Master/Slave   Not in use

3

Main
Network
Synchronization
Status
Firmware

Power-on selftest
Power-on selftest succeeded.

Client status
Not connected to any client
Last Client   Module
Last User   Module
Last Application   Notar

Temperature
Module temperature 41.0 °C / 105.8 °F.

Power status
Module power sources
DC input   Active
Power over ethernet

Frame power sources
AC input   Not available
DC input   Not available
Battery slot 10   Not available
Battery slot 11   Not available

4

Main
Network
Synchronization
Status
Firmware

Update firmware
Firmware file (*.lxi):

Progress: 0 %
Status: Waiting to receive firmware file

This module requires firmware version 0.5.6.166 or later. The curr

Help
To update the firmware in this module:

1. Use the Browse button to locate a suitable firmware file (.lxi
2. Press the Start update button
3. When the update process has completed, the module will ret

The default location for firmware files installed with Pulse is:
C:\Program Files\Bruel and Kjaer\PULSE\IdaSW\PromUpdate

1) The **Network** page allows you to set a static IP address, or obtain a new DHCP IP address (not recommended).

2) The **Synchronization** page shows the current synchronization method in use (not relevant for single stand-alone modules).

3) The **Status** page shows the status of the front end, including self-test status, temperature, power, etc.

4) The **Firmware** page shows the front end's current firmware and provides detailed information on firmware updates.

NOTE: It is not possible to download or open files such as firmware updates using Apple Safari (the default browser on iPad).

CHARGING YOUR BATTERY

		Flashing LEDs			*Solid LED*
0 – 20%	20 – 40%	40 – 60%	60 – 80%	80 – 90%	Fully charged

To check the charge level, press the **Status** button on the battery. The status indicators are as shown to the left. Each LED bar is equal to approximately 1.5 hours operation.

You can charge the battery using the following:

- DC charge: using Battery Charger ZG-0858. To utilize in-vehicle cigarette lighters, use the included Car Utility Socket Cable AO-0546

- AC charge: using Battery Charger ZG-0469[*] (input range: 100 – 240 V AC, 50 – 60 Hz)

With either option, it takes approximately three hours for the battery to be fully charged.

1) Ensure the battery's power switch is in the **Active** position.

2) Plug the charge cable into the frame's charge input connector.

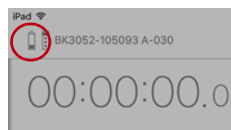3) In the Sonoscout app, an icon in the top left corner displays the charge level.

1

2

3

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[*] Included with the battery

Brüel & Kjær

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