

NoiseMeters

LiveNoise
LNT-SE Noise
Monitor
User's Manual

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Introduction

This manual covers the LiveNoise LNT-SE Noise Monitor, version 1.x.x.

The LNT-SE is a noise monitor that connects to the LiveNoise Supervisor software, becoming part of a LiveNoise Monitoring System. The LNT-SE noise monitor provides the following:

- Data Logging of:
 - o Noise Profile - LAeq,1s – the average A weighted sound level every second
 - o Periodic Noise Parameters, LAeq, LAFmin, LAFmax, L5, L10, L50, L90, L95, L99 over 5, 10, 15, 30 and 60 minute periods
 - o Threshold triggered noise alarms
- Live Noise (via Supervisor Software)

The noise monitor is designed to be secured to a wall using four screws. It has protection against rain and dust and so can be mounted inside or outside for long periods of time.

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It connects to your WiFi or wired Ethernet network in order to communicate with the **Supervisor** software, which is included with the monitor.

Software Installation

Two programs are included with the LNT-SE Noise Monitor.

LiveNoise Supervisor

The **Supervisor** software should be installed on one computer on your network, preferably a computer that is switched on all the time, although this isn't essential.

The **Supervisor** software connects to all the LiveNoise Noise Monitors on your local network. It displays the sound levels in real time, is used to configure the noise monitor settings and can display alarms when high noise levels are detected. It also downloads noise measurements and stores them on your local disk or network so you can generate long term noise reports.

If you only want a live sound level display then you only need the **Supervisor** software. You can always add **Reporter** at a later date if you change your mind.

Please read the [Windows Firewall](#) section in the Supervisor Software section of this manual before running the software.

LiveNoise Reporter

The **Reporter** software is used to view the long term noise measurements that have been downloaded by the **Supervisor** software. You view, print and export noise reports over daily, weekly, monthly and custom periods.

You can install this software on the same computer as the **Supervisor** software (this is the easiest) or on any other computer on your network. As long as **Reporter** has access to the data folder that **Supervisor** is storing in, it will be able to generate the reports. You can install **Reporter** on multiple computers, there are no license restrictions.

Install from USB Memory Stick

A small USB memory stick will be included with the noise monitor. Both the **Supervisor** and **Reporter** software will be available to install.

Downloading the Software

You can download the latest versions of both programs from:

<http://livenoise.net/install/>

Noise Monitor Installation

The LNT-SE enclosure has the facility to be mounted using four screws, one at each corner. It is ideally suited for mounting on a wall, but of course other mounting methods can be used.

Please note that when using the standard power adapter and power cable, the unit needs to be mounted within 10m (or 32 ft) of an indoor power socket. See **Power Connection** section for more details.

Wall Mounting

Remove the front panel by undoing the four screws.

You can now access the four screw holes that are used to mount the unit to the wall.

The picture shows the noise monitor with its front panel removed.



Power Connection

The noise monitor is provided with 10m (32ft) of cable already installed through a weatherproof gland at the bottom of the enclosure. The connector at the end of this cable and the power adapter itself **are not weatherproof and should be mounted indoors.**

Plug it in and switch on. After a brief startup time the display should start showing the sound levels. The monitor is now recording and storing noise measurements. It will also be trying to connect to the **Supervisor** software, but will not succeed until you have connected it to the network.

Wired Ethernet Connection

The LNT-SE Noise Monitor has an RJ45 Ethernet Port on the bottom of the box.

For indoor use, a standard Ethernet cable can be used.

For outdoor use you need either a weatherproof Ethernet cable of the correct type (to connect to the threaded socket) or you can use a standard cable with a weatherproof RJ45 cable housing. Both options are available from NoiseMeters.

WiFi Connection

With the LNT-SE Noise Monitor plugged in and powered up, it now just needs to know the name and password for your WiFi router. This information is programmed into your noise monitor using a memory stick - the Supervisor software writes the WiFi settings to a memory stick, which you then insert into the noise monitor.

- Run the **LiveNoise Supervisor** software
- Select the **System | Device Setup | Create Memory Stick** option from the menu

You should see a window similar to this:

The screenshot shows a window titled "Create Network Memory Stick" with the following elements:

- WiFi network configuration
 - Network Name (SSID):
 - Network Password (PSK):
 -
 - Networks Added:
 -
- LiveNoise Supervisor
 - IP Address:
 - Port:
- Service Mode
 - Put the monitor into "Service Mode" while the USB stick is inserted. For field calibration.
-
- Insert a USB Memory Stick:
 -
 -

- Select the **WiFi network configuration** option
- Enter the name of your network (SSID) and the password (PSK) and click the **[Add]** button
- If you have multiple routers and want the noise monitor to connect to whichever is available then enter the name and password for each, followed by the **[Add]** button
- Click the **LiveNoise Supervisor** option - this informs the noise monitor where to find the **Supervisor** computer on your network
- Insert a memory stick in your computer's USB port - a suitable one will have been included
- Select the memory stick drive from the **Select Memory Stick** option
- Click the **Create Memory Stick** button

You can now remove the memory stick from your computer's USB port.

This memory stick can now be used to configure the WiFi settings of one or more noise monitors. With the monitor switched on and left for at least 30 seconds to start up, plug the memory stick into its USB port. After three or four seconds the red display, which shows the current sound levels, will go off and then back on again. This

means the monitor has read the memory stick and is ready to connect to the network.

When you remove the memory stick the noise monitor will restart and connect to the network.

The memory stick contains your network name and password and so should be erased or stored securely.

Networks, Firewalls and File Storage

The noise monitors communicate with the **Supervisor** software over your network and they synchronize their clocks via the Internet. On a basic local area network the noise monitors should work with no additional changes. However, extra security and firewalls may restrict communications.

The following information is intended for the network supervisor or IT manager and assumes a certain level of knowledge about networks, firewall and router configuration, and access rights.

Fixing Local IP Addresses

The IP address for each monitor need **not** be fixed. Under normal operation communication is initiated by the noise monitor connecting to the **Supervisor** software. The **Supervisor** software does not need to know where each monitor is.

The noise monitors need to know where computer running the **Supervisor** software can be found. It is better to fix this computer's IP

address on your local network. Failure to do this will mean you have to instruct the software to search for each noise monitor whenever the computer's IP address changes, which is a time consuming process.

Firewalls and Ports

Port 53941 - Noise Monitor Communications

The LNT-SE Noise Monitors use Port 53941 to communicate with the **Supervisor** software. The system will not function at all if the network or the computer's firewall restrict two way communication on this port.

Port 53942 - Search for Noise Monitors

The **Supervisor** software can be instructed to search for noise monitors on the local network. It uses Port 53942 for this purpose, sending a message out, instructing noise monitors to connect up. If this port is not open for communication then you can use a memory stick to inform each noise monitor of the **Supervisor's** IP address and the system will function correctly.

Port 123 - Network Time Protocol

The noise monitors need to connect to an NTP server on the Internet to keep their clocks in synchronization. This is done approximately once every hour.

The noise monitors have an accurate internal clock and so can operate for long periods without access to the Internet, but for accurate time keeping it is essential to have access to the outside world on Port 123.

Port 80 - Software Updates

The **Supervisor** and **Reporter** software use Port 80 (HTTP) to check for updates. The software will operate without this access, but will not be able to check for updates. Please note that the update checks are not carried out automatically, but whenever you use the **Help | About** menu option. At this point you can choose whether to view and install any updates that may be available.

Port 25 or Port 587 - Email Alerts

If you want the software to send you email alerts of high noise levels, it will need access to Port 25 (SMTP) or Port 587 (SMTP). Some service providers allow Port 25, some allow Port 587. If

you are unsure, try one and then the other and use the **Test** button.

The emails are sent using a NoiseMeters SMTP server, so the software does not need to know your email login details, just the email addresses to send to.

If you are not using email alerts then Ports 25 and 587 can be left closed.

File Storage

Each noise monitor stores its noise measurements in internal memory for up to five years. These measurements are also downloaded by the **Supervisor** software and stored on the computer's hard drive or local network.

By default, the **Supervisor** software stores the noise measurements from all monitors in:

C:\ProgramData\NoiseMeters\LiveNoise-SV\data

The location of **ProgramData** may have been changed by your IT manager, in which case this path may be different.

You can check the exact path used, and change it to something else, using the **System |**

Preferences menu option in the **Supervisor** software.

If you change this, for example to save the data to a networked location, then you should change all copies of **LiveNoise Reporter** too, using its **Edit | Preferences** menu option.

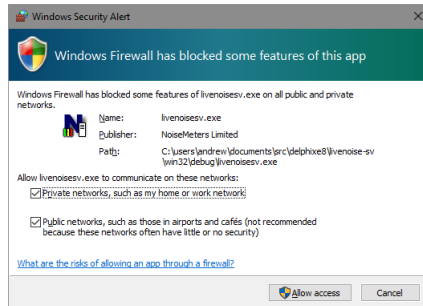
Supervisor Software

This section of the User Manual covers the basics of the **Supervisor** Software to get it connected to the noise monitors. More operational details are available from the program's help files.

The purpose of the **Supervisor** software is to communicate with the noise monitors, show the real-time sound levels, indicate any high noise level alarms, and store the noise measurements for later reporting.

Windows Firewall

When you first run **LiveNoise Supervisor** you may receive a message from Windows Firewall.



Select your network type(s)
and click **[Allow Access]**

It is important that you click the **[Allow Access]** button, otherwise it will not be able to communicate with the noise monitors.

If you fail to do this, you can access the Windows Firewall from Control Panel and add **LiveNoise Supervisor** (livenoisesv.exe).

Connecting to Noise Monitors

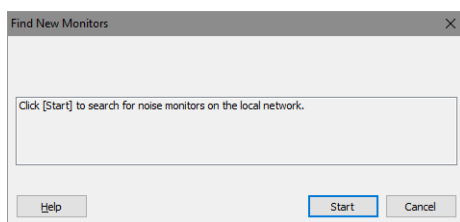
Start the **Supervisor** software. If the noise monitors already know the address of the **Supervisor** computer (have been connected before, or informed of the address using a memory stick) then they should automatically connect up within 30 seconds.

If you have new noise monitors connected to your network that don't know the address of the

Supervisor computer then they need to be informed. There are three ways to do this:

Method 1 - Search for Monitors

You can instruct **Supervisor** to search your local network. Select the **System | Device Setup | Find New Monitors** menu option.



Click the **[Start]** button to begin the search, which should take around 2 ½ minutes to complete. Once you see that it has detected all your noise monitors you can stop the search early using the **[Cancel]** button.

Technical: This search assumes subnet mask of 255.255.255.0. For example, if your computer's IP address is 192.168.0.27, this search will look at all 256 addresses from 192.168.0.0 to 192.168.0.255 to detect noise monitors. If the monitors are outside this range then you need to use one of the other two methods to detect them.

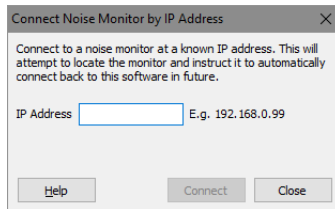
Technical: This method will only work if the noise monitor and software are allowed to

communicate over Port 53942. See the manual section [Port 53942](#).

Method 2 - Connect by IP Address

This method can be used if you know the current IP address of the noise monitor on your local network.

Select the **System | Device Setup | Connect by IP** menu option.



Type in the IP address of the noise monitor and click the **[Connect]** button. You should get one of the following messages:

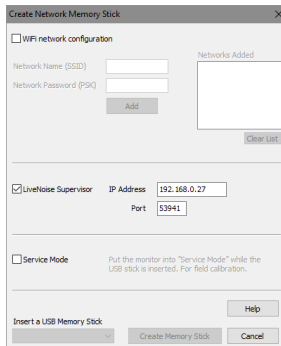
Device found on xxx.xxx.xxx.xxx - The software has found the noise monitor and instructed it to make a connection. It should connect up within the next 30 seconds.

Failed to connect on xxx.xxx.xxx.xxx - Check the IP address is correct and that your computer is free to communicate with the noise monitor on [Port 53941](#) and [Port 53942](#).

Method 3 - Using a Memory Stick

The information about the **Supervisor** computer's IP address can be put onto a memory stick, which is then inserted into the LNT-SE Noise Monitor's USB port. A suitable memory stick was included with the LNT-SE. If that is not handy then most standard memory sticks should work.

Insert the memory stick into the computer's USB port. In the **Supervisor** software, select the **System | Device Setup | Create Memory Stick** menu option.



Select the **LiveNoise Supervisor** option, as shown.

The IP address of your computer should appear automatically in the **IP Address** field. If not, please enter it manually.

The communication Port should usually be left at 53941, unless your noise monitors have been provided with a different Port set.

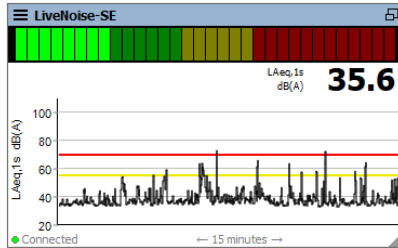
Click the **[Create Memory Stick]** button to write these settings out.

You may now remove the memory stick and insert it into the noise monitor's USB port. After three or four seconds the noise monitor's display (usually shows the sound level) should go off and then come back on again. This indicates that the memory stick has been read and can now be removed.

The noise monitor should now look for the **Supervisor** software on the given IP address and connect up within 30 seconds.


User Interface

Each noise monitor has its own window, where the sound levels are displayed and containing the menu for configuring that particular monitor.




The live sound levels can be displayed numerically, on an "LED" bar, or graphically over a period between 1 minute and 1 hour.

Live Level LED Bar

Use the  toolbar button or select the **View | Live Levels** menu option to turn this feature on and off. The Green/Yellow/Red bar shows the Fast Sound Level (LAF) every 1/8 second, clearly indicating when the two sound level thresholds are exceeded.

This feature uses the most bandwidth on your network. It is still not a huge amount of data, but if you want to reduce your usage turn this option off. If you are operating on a slow network connect then this may not manage to operate at full speed.


Time History Chart and Numerical Display

Use the  toolbar button or the **View | Time History** menu option to control this feature. The chart and numerical display are updated once every second, and show the average sound level every second (LAeq,1s) in dB(A).

You can select the period to display in the chart using the **Period** option on the toolbar.

Please note that if you make the noise monitor windows small, the chart's axis labels and the numerical value will disappear to make more space for the chart.

Minimal Display and Bandwidth


You can reduce the display and bandwidth to a minimum by turning off the LED Bar and the Time History. You can use the  button on each noise monitor window to reduce the display some more. All the measurements are still recorded and downloaded, but the live display and communication are at a minimum, taking fewer resources on your computer and on the network.

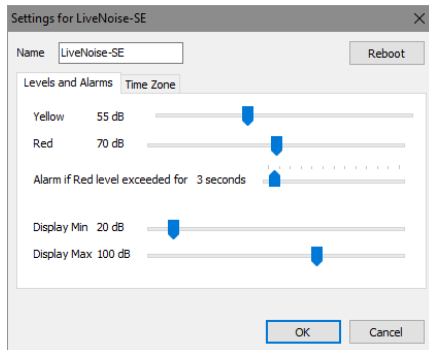
Alarms are still flagged up as they happen, causing the noise monitor window to flash red.

If you minimize the whole program to the task bar or the system tray (option in File | Preferences) then it automatically reduces communications to a minimum.

Noise Monitor Configuration

Each noise monitor holds its own configuration, so each can have different alarm triggers.

To configure a noise monitor, click the  menu button on the noise monitor's window and select the **Settings** option.



The current settings will be downloaded from the noise monitor and displayed in a new window.

Name

The name that you use to identify this noise monitor. It is displayed on the noise monitor's window and in the Reporter software. It is limited to 16 letters and numbers.

Alarm Settings - Yellow / Red / Duration

The noise monitor can send an alarm message to **Supervisor** when the sound levels are too high.

Yellow - A visual warning that the levels are getting close to the alarm levels. This is indicated in the Supervisor software as yellow on the LED Bar and with a yellow line on the Time History chart. Other than the visual warning, this level is not used for generating alarms.

Red - The alarm level. It is indicated in the software on the LED Bar and as a red line on the Time History chart. When the sound level is above this trigger level for more than the specified time an alarm will be generated.

Alarm if Red level exceeded for... - The length of time (in seconds) that the level should be above the Red trigger level before an alarm is generated. Setting this to 0s will result in an alarm for any exceedance.

Display Min and Max - This allows you to have a fixed minimum and maximum range of the LED Bar and Time History Chart, which can be different for each noise monitor. For this to work you need to select **Individual scaling for each monitor** in the program **Preferences** section.

Time Zone

The noise monitor synchronizes its clock to an NTP server on the Internet. However, it needs to know what time zone it is operating in to make the necessary adjustments. We endeavor to ship noise monitors out preset to your time zone. However, we may not know what time zone you are in, or you may relocate the monitor. In this case you can change each noise monitor's time zone from the **Time Zone** tab on the **Settings** window. Just select a region and a city that is in the same time zone as the monitor's location.

Noise Monitor Calibration

The noise processor part of the LNT-SE noise monitor is factory calibrated along with its attached microphone. If the microphone is changed, the noise monitor's calibration should be checked.

In normal operation we recommend regular checking of calibration if the measurements are going to be used for legal purposes. Some regulations demand that the calibration is checked regularly.

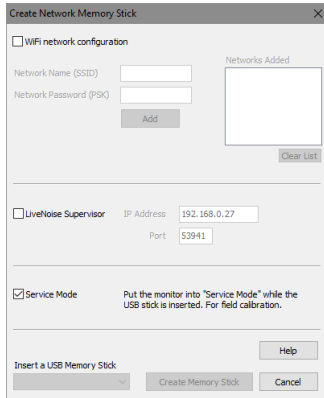
To calibrate the LNT-SE, you need a suitable Sound Level Calibrator with a 94 dB output and 1/2" cavity. You also need a USB memory stick. A memory stick is included with the noise monitor, but most standard USB memory sticks will work.

Create a Service Mode Memory Stick

The memory stick is used to switch the noise monitor into "Service Mode". In this state the noise monitor continues to operate but stops storing noise measurements and looks for the calibration tone.

In the **Supervisor** software select the **System | Device Setup | Create Memory Stick** option.

A window appears with the memory stick options:



Select the **Service Mode** option, insert the memory stick into the computer's USB port, select the correct drive and click the **Create Memory Stick** button.

You can use this same memory stick to calibrate multiple noise monitors. No need to create a new one each time.

Monitor Calibration

To check the calibration on each noise monitor:

- Insert the memory stick into the noise monitor's USB port. After about 3 seconds

the monitor's display should blink off and then on again to indicate it has seen the memory stick and switched to service mode.

- Switch the Calibrator on to 94 dB and push firmly onto the microphone.

Once the noise monitor has detected the Calibrator it will once again switch the display off while it carries out the calibration. This takes at least 8 seconds, and longer if the sound level is not steady.

Once calibration has finished the display will come back on and settle to 94.0 dB +/- 0.2dB.

Remove the Calibrator and memory stick. The noise monitor will switch out of Service Mode and automatically continue making its measurements.

Calibration Failure

If the display stays off for 30 seconds or more during the calibration process then the noise monitor considers the sound level from the calibrator to be unstable.

If the display fails to settle to 94.0 +/- 0.2 dB after calibration then this also suggests a failure.

Noise Monitor calibration failures are usually due to microphone damage. Please contact your supplier or NoiseMeters if you have calibration failures so we can help to rectify the problem.

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