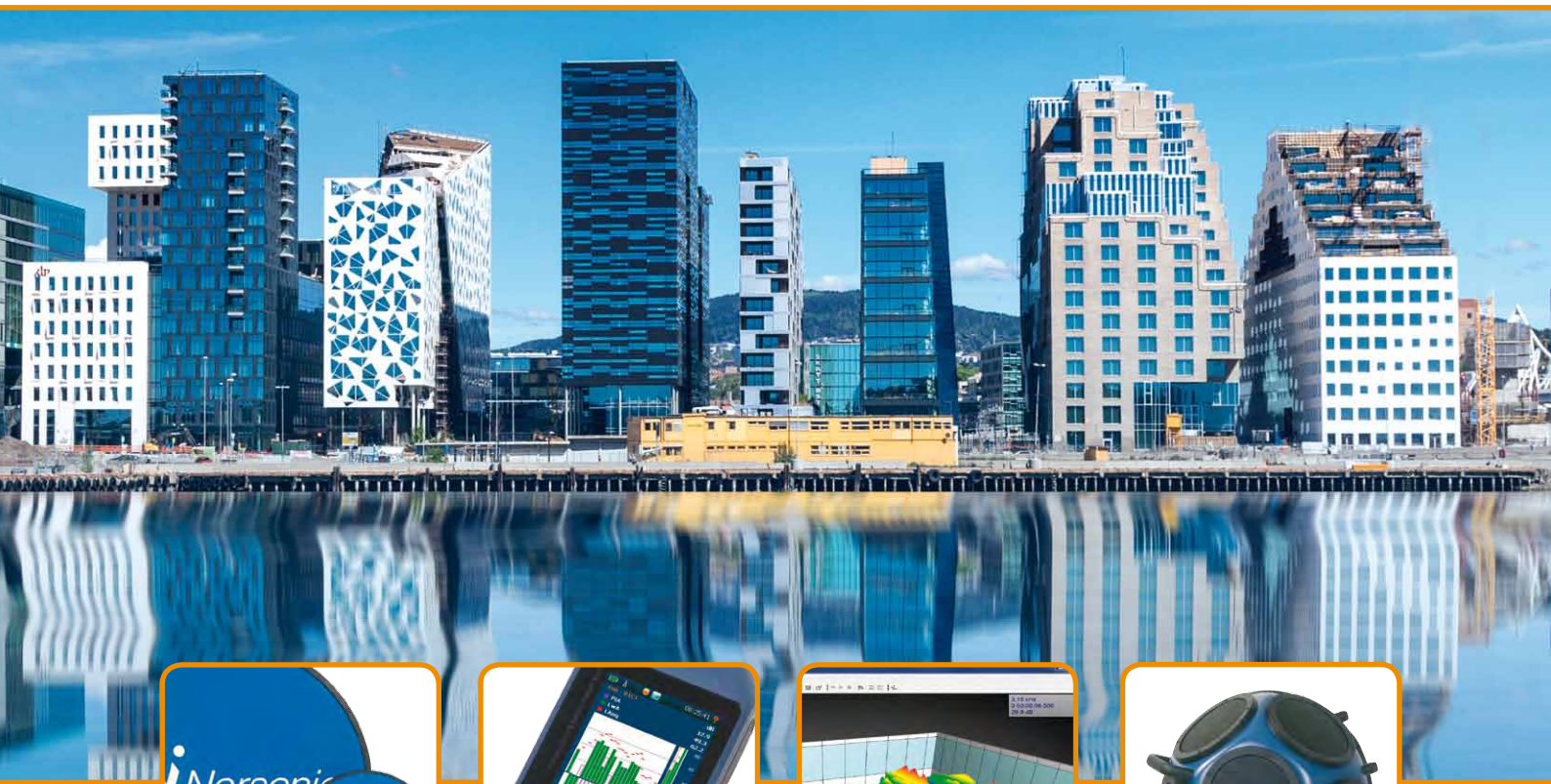
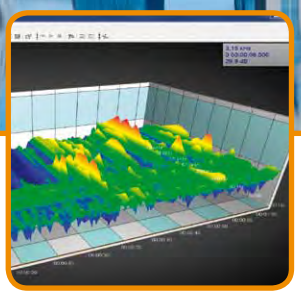
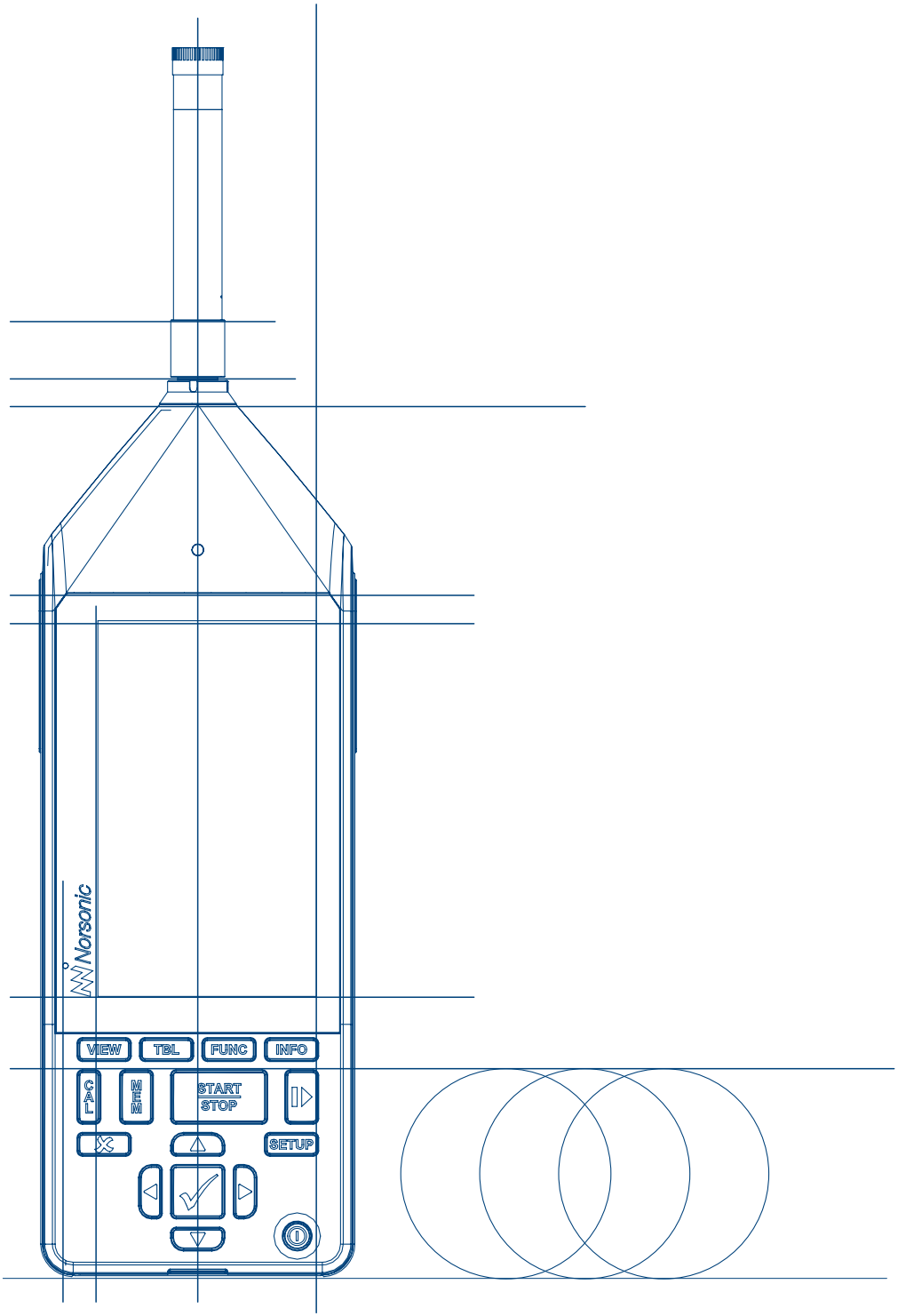
Product Range Catalogue

2016/2017





Norsonic


Norsonic
VIEW
TBL
FUNC
INFO
CAL
MEM
START
STOP
SETUP

Innovative sound instrumentation

Norsonic is one of the world's leading manufacturers of precision measurement instruments for sound and vibration applications. Since 1967, the specifications for our successful instruments have been based on the requirements of regulations found in the EU, North American and other industrialised countries.

By careful attention to the user's requirements at the design stage, it has been possible to increase the complexity of the instrument yet preserve a user interface that is convenient and easy to understand. Our products have been developed in close consultation with our customers in more than 35 countries around the world.

It is by listening to our customers' needs that keep Norsonic at the forefront of the world market for sound and vibration instrumentation. Our vision is to supply our customers with the most innovative sound instrumentation of the highest quality.

Norsonic offer 3 year warranty. Our quality philosophy permeates the whole lifecycle of a product. It starts with the design, continues with internal design tests, and ends with pattern evaluation for legal metrology at international laboratories such as the PTB in Germany.

Our products have for decades been type approved in order to secure that the produced measurement results are accurate and within the given specifications. All our sub-contractors are carefully selected and frequent quality audits assure that they keep a high quality standard.

Full test and calibration in accordance with relevant international standards, such as IEC61672, are carried out before the products leave the factory.

Norsonic Calibration Laboratory (NCL) is an international accredited laboratory. Products producing absolute levels, such as acoustical calibrators, tapping machines and reference sound sources are supplied with accredited calibration certificates as a part of the delivery. This is unique, and not done by any other supplier.

Norsonic uses a minimum of 20% of its turnover in research and development. A great portion of this amount is used to design new features in existing products. We are active member of the international standardisation work to ensure that you as a Norsonic customer keep your products up to date for many years after your initial purchase.

Our R/D department has close cooperation with collaborating partners in order to take advantage of special technology not offered by internal resources.

At Norsonic, we are proud to serve our customers and listen to their needs. All our products are developed in close cooperation with customers by listening to their needs and wishes.

For more detailed information visit us at www.norsonic.com

Norsonic

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Sound Level Meters

Norsonic offers a complete range of sound level meters. Whatever measurement application you have, Norsonic has the right tool. Not only the sound level meters and accessories, but a range of controlling, post processing and reporting programs help you to evaluate, compute and create reports - easy and intuitive.

All our products are based on the same design philosophy; intuitive, durable and sophisticated, packed in a rugged, yet small, easy to use instrument with more than 120dB dynamic range – no need to worry about gain settings.

A Norsonic instrument is kept up to date for years after the date of purchase. New program versions are issued frequently with new features and support for new standards when they are published.

Nor131

Nor132

Sound Level Meters Nor131 & Nor132

Class 1 and class 2 Sound Level meters designed for occupational hygiene, general sound level measurements and noise assessments applications. It can be extended with 1/1 and 1/3 octave real time filter bands, STIPA and reverberation time calculation based on impulse excitation. Huge internal memory and USB interface for easy data dump to a PC. The Nor131 is supplied with detachable IEPE preamplifier allowing use of extension cable. Nor132 comes with a fixed preamplifier.

Applications

- Noise hazards in the workplace
- Prescription of hearing protection
- Environmental noise logger
- Product noise testing
- Speech intelligibility - STIPA
- Reverberation time measurement
- General purpose sound level meter

The Nor131 and Nor132 are easy to use – just push the start key and measure. There are only three buttons you need to operate to complete a measurement, clearly indicated by the orange colour; Power on, Calibration and Start measurement. The other buttons are just short keys for quick access to the most important settings.

Environmental Meter Nor139

Class 1 Sound Level meter mainly designed for advanced noise assessments and noise logging, featuring event triggered sound recording and manual marker setting. May optionally be fitted with 1/1- and 1/3-octave filters with multispectra resolution down to 100ms time resolution. Huge internal memory, USB interface and SD-card makes it easy to import measurement data to a PC for further post-processing and reporting.

Applications

- Environmental noise assessments with sound recording and markers
- Environmental noise logger
- Noise hazards in the workplace
- Product noise testing
- Noise nuisance recorder
- General purpose sound level meter

The Nor139 is easy to use – just push the start key and measure. There are only three buttons you need to operate to complete a measurement, clearly indicated by the orange colour; Power on, Calibration and Start measurement. The other buttons are just short keys for quick access to the most important settings.

Sound Analyser Nor140

Class 1 Sound Analyser covering all the features of the Nor13x series of sound level meters plus building acoustics and a large vast of other applications. This is the perfect tool for acoustic consultants, R/D engineers and other highly professional users that need a sound level meter covering literally all applications a single channel sound level meter can measure. Huge internal memory, USB interface and SD-card makes it easy to import measurement data to a PC for further post processing and reporting.

The Nor140 is seamless integrated with Nor850 multichannel system. It can be used as a frontend in a Nor850 system or only the Nor850 post processing and reporting tools that are available for building acoustics and sound power.

Control your Nor140 from a smartphone. The Nor140 in combination with the noise terminal Nor1530 and NorRemote give you a unique freedom to take control of your Nor140 from any place in the world.

Applications

- Environmental noise assessments with markers and sound recording
- Environmental monitoring
- Building acoustics
- Noise hazards in the workplace
- Product development
- Product noise testing
- Quality control
- Noise mapping
- Sound power
- Speech intelligibility - STIPA
- Vibration measurements
- Noise nuisance recorder
- Front end for Nor850

The Nor140 is easy to use – just push the start key and measure. There are only three buttons you need to operate to complete a measurement, clearly indicated by the orange colour; Power on, Calibration and Start measurement. The other buttons are just short keys for quick access to the most important settings.

Sound & Vibration Analyser Nor150

The Nor150 Sound and Vibration analyser sets new standards in user-friendliness and sophistication not yet found in any other sound level meter on the market today.

Featuring a large 4.3” true colour touchscreen, the Nor150 provides the user friendliness of a smartphone. Further features include; two measurement channels, built in web server, camera, GPS and advanced voice and text notes bringing the sophistications normally found in laboratory instrumentation out in the field. Connect your smartphone, pad or PC and take full control of the instrument. Add photos and voice notes obtained on your smartphone or pad seamless integrated with markers to your noise data.

The Nor150 is a multi-tool covering a vast variety of applications.

Applications

- Environmental noise assessments
- Building acoustics
- Sound intensity
- Noise monitoring
- Product noise testing
- Vibration measurements
- Noise in the workplace
- Ultrasound and infrasound
- Noise nuisance recorder
- Dual channel
- Front end for Nor850

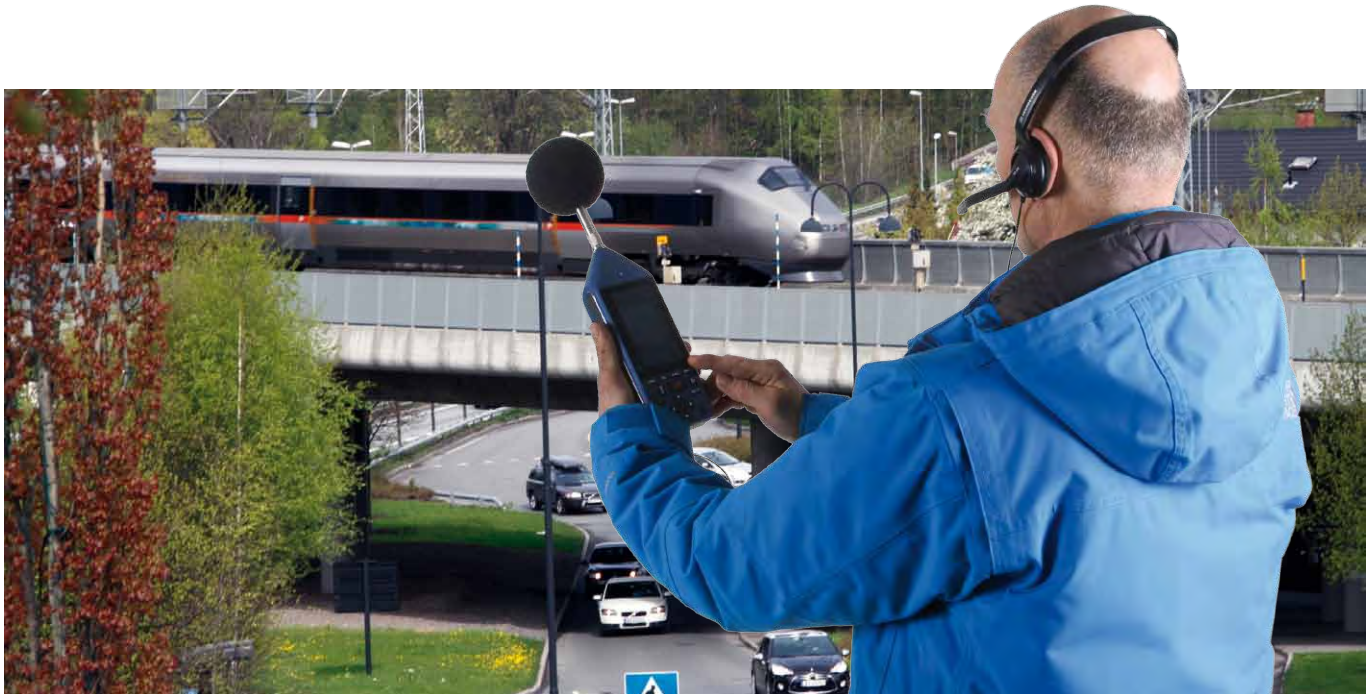
Approved by:
PTB, Germany
BEV, Austria
METAS, Swizerland
...and others

Nor150 - Environmental Analyser

The Nor150 is ideal for all type of environmental noise measurements, attended or unattended, single or dual channel measurements.

For attended measurements a sophisticated marker management system with up to 10 user defined markers eases the post processing and reporting task. The event triggered audio recording and pictures further enhanced the use for unattended measurements. An advanced trigger system offering different trigger levels for Day, Evening and Night. The dual channel option further expands the use of the system. The built in GPS function is useful for tagging the measurement position and for clock synchronisation when several units are in use for blast monitoring or similar applications.

The NorRemote smart phone app connects seamless to the Nor150 and gives the user full control of the instrument. Pictures and voice notes taken on the smartphone is automatically transferred to the instrument and bundled with the measurement data. The camera on your smartphone or any IP camera may be controlled by the Nor150 event trigger.



Nor150 - Sound Intensity Analyser

The Nor150 fitted with sound intensity option and the sound intensity probe kit Nor1290 is a powerful tool for all type of sound intensity measurements. It is designed for easy use in all type of measurement conditions.

The remote control handle using a Smartphone as a measurement control and displaying device forms a light weighted and easy to use system, allowing the user to perform all measurements with a single hand operation. The Smartphone communicates via WiFi with the internal web server running in the Nor150. The system may also be used with the sound intensity probe directly attached to the Nor150.

Applications

- Sound Power measurements in accordance with
  - ISO 9614
  - ANSI S12.12
  - ECMA 160
- Noise Mapping
- Noise Source locations

Features

- Compliant with IEC 61043 class 1
- Robust and easy to use
- Full on-board support for ISO 9614
- 1/1 and 1/3 octave analyses
- Frequency range 50-10kHz
- Photo, text and voice note annotation
- Built in signal generator for calibration
- Export to Nor850 mapping software
- Measurement quality indicators
- Supports traditional and IEPE powered sound intensity probes
- ¼" and ½" microphones

Nor150 - Building Acoustic Analyser

Norsonic continue its longtime tradition for creating the state-of-the art building acoustic analysers. The Nor150 is no exception in this respect! It can be used as a manually operated single or dual channel building acoustic analyser, or as a remotely controlled advanced building acoustic frontend for the Nor850 multichannel system.

The Nor150 offers a built-in signal generator for excitation of the source room level measurements or for excitation of the reverberation time measurements. The results are measured in accordance with the ISO 16283 Standard requirements. With additional background level measurement results, the Nor150 has an on-board calculation of the final airborne sound insulation indices D_{nT} and R_w in accordance with ISO 717. Of course, the similar possibility is available for impact sound insulation index $L_{n,w}$ using a tapping machine such as the Nor277.

The reverberation time excitation may alternatively be based on an impulsive source. In any case, the Nor150 calculates the results for T_{15}, T_{20} and T_{30} in parallel.

The Nor150 analyser is seamless integrated with the Nor850 software, either as a remote frontend to the Nor850 Measurement System, or as a manual measurement tool for exporting measurement files to the post processing Nor850 Reporting System.

Nor150 - Noise at Work Analyser

The Nor150 is the right tool for the noise at work experts. It covers all the use in one unit.

The wide frequency range covers all applications from ultra to infra sound and single axis vibration measurements. The analyser allows you to create your own measurement setups that pop up on the start-up screen. The pause and graphical back erase function helps you to remove unwanted events from the measurement in situ. You may add markers to the measurement to separate different work sequences within a measurement. Easy and intuitive.

The built in camera, text and voice annotation, ensures fast and easy documentation of the various measurement locations. Creating a report is easy using NorReport and templates tailored to various national regulations.

Future proof, expandable and 3 year warranty

The Nor150 Analyser is designed to be expanded and upgradeable to give you a complete measurement tool for years to come. Norsonic's retrofit policy ensures regular software updates with new features and new options. There are more to come...

Sound Level Meter selection chart	Nor131/132	Nor139	Nor140	Nor150
General Sound Level Meter	√	√	√	√
Measurement channels	1	1	1	2
1/1 & 1/3 octave band	6,3Hz - 20k	6,3Hz - 20k	0,4Hz - 20k	0,4Hz - 20k
+10 dB extended measurement range			√	√
Reference spectrum			√	√*
Statistical calculations	√	√	√	√
Parallel Time constants		√	√	√
A, C, Z weighting networks	√	√	√	√
One measurement range - no gain setting	√	√	√	√
Dynamic range (dBA)	17/25 - 137	17 - 137	17 - 137	17 - 137
Max. peak 140 dB	√	√	√	√
0-20 sec measurement pause back erase		√	√	√
Multilingual menu system	√	√	√	√
Sensor database with calibration history and administration				√
SD-card for storage of measurement and audio recordings		√	√	√
USB interface	√	√	√	√
High speed RS 232 interface		√	√	√
LAN interface & Wi-Fi via USB dongle				√
GPS and internal web server				√
Occupational & Industrial hygiene	√	√	√	√
Compatible with NorProtector	√	√	√	
Reverberation table based on impulse exitation	√		√	√
Ultrasound AU network				√*
Environmental Noise Assessments	√	√	√	√
Level vs time resolution	≥ 1 sec	≥ 100ms	≥ 25ms	≥ 5ms
Graphical L/t curve		√	√	√
1/1 & 1/3 octave band multispectrum		√	√	√
Moving Leq calculation with threshold markers		√	√	√
Two independent L/t reports				√
Audio recording		√	√	√
Picture				√
Support for SYSCHECK of microphones			√	√
Support for heating of Nor1216 microphone			√	√
Compatible with NorReview	√	√	√	√
Compatible with NorRemote			√	√
Five independent event triggers for Audio and Picture				√
Remote app - control from smartphone / pad			√	√
Building Acoustics			√	√
Noise and impulse based RT with graphical curve			√	√
Noise generator			√	√
Swept sine			√	√*
Audiometer calibration			√	
FFT			√	√*
STIPA	√		√	
Sound Intensity				√
Survey Sound Power measurements according to ISO 3746			√	
Compatible with Nor850 software			√	√
Noise Nuisance Recorder with remote trigger		√	√	√

√* = Available in later versions

Generating reports

Measuring sound is often more than just reporting a dBA value. Most measurements are made in accordance to a measurement standard, requiring that a report generated on a standard format or sometimes you may need a customized report or calculation in Excel made. For this, Norsonic offers a broad range of post processing programs that helps you to evaluate the measured data and generate proper measurement reports. Extracting the data from a Norsonic sound level meter is ever so easy. We have made several solutions dependant on your application. Below is a list of the most used programs.

NorConvert Nor1049

A program for automatic downloading and converting to Excel of Norsonic measurements from Nor13x-series and Nor140 instruments. The program transfers all files on the sound level meter not yet transferred before. Freeware included with the sound level meter.

NorXfer Nor1020

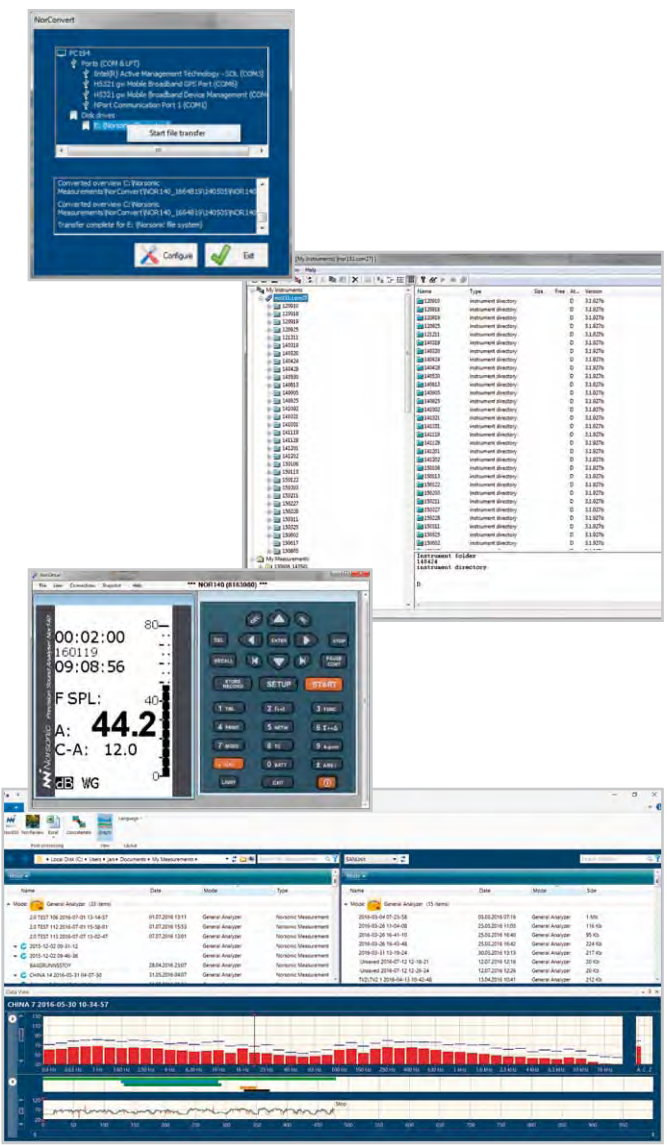
A program for downloading and converting to Excel of Norsonic measurements from Nor13x-series and Nor140 instruments. Unlike the NorConvert you have a browser feature for full freedom of selecting the measurement files to transfer. Optionally a controlling and remote downloading via 3G/4G is possible. The basic version is freeware and is included when purchasing a sound level meter.

NorVirtual Nor1036

A program for emulating the sound level meter on a PC. Whatever view the sound level meter has (graphs, menus, tables etc.), the same view is visible on the PC screen. The mouse can be used to operate the virtual keyboard. Freeware. Work with Nor13x and Nor140 series of instruments.

NorReport

A program for generating customized Excel reports based on templates. The program communicates seamlessly with NorXfer and NorConvert. Several templates are available for various applications adapted to local national standards. NorConnect is freeware and is included when purchasing a Nor150.



Measurement System Nor850

The Nor850 measurement system is the state-of-the-art acoustical analyser from Norsonic. Using the experiences and accumulated knowhow from the previous generations of analysers such as Nor811, Nor823, Nor830 and Nor840, Norsonic is offering a unique multi-channel system.

The software Nor850 Suite is connecting a variable number of individual measuring units to create the optimal system that suits any measurement task. Dedicated user-friendly offer the following application packages:

General analyser


Building Acoustic


Sound Power


Appliance Noise

General Analyser Mode

The General Mode allows the user to make mulitspecter measurements in all channels simultaneously with various settings for frequency range and level profiles. The profiles have user-defined period lengths from a few msec to several minutes. The results are presented in user-defined setups with both level vs. frequency and level vs. time views as well as tables. Special views for 3D or Spectrogram are also available.

Quality control measurements are easily made using the two reference spectra possibilities. Each reference spectre may be used as a lower or upper boundary with a Go/NoGo output to the operator.

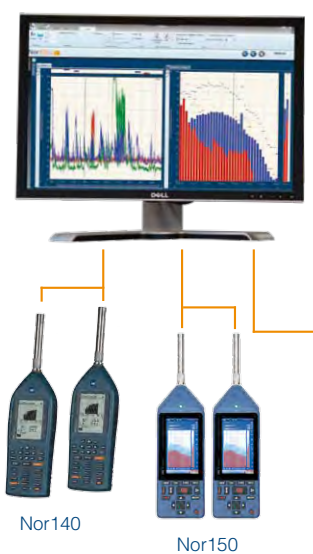
The Nor850 Suite offers an environmental software extension that enables the user to make audio recordings in selected channels and to insert event markers along the timeline during the measurement sequence.

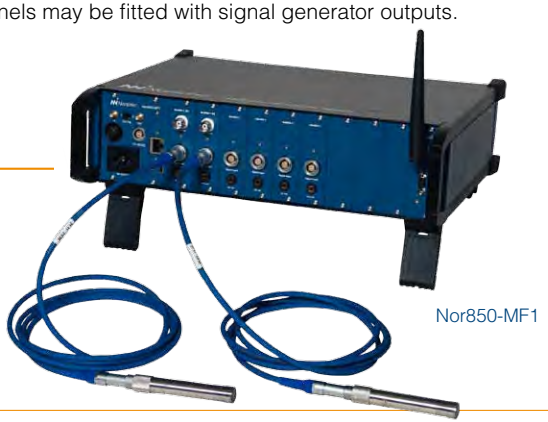
Nor850-MF1

The Nor850-MF1 rack is designed to contain up to 10 measurement channels. Each channel module has the same features and specifications as the Nor140, but can only be remotely controlled from the Nor850 Suite via LAN interface. For wireless connection, a router is attached to the LAN connector. The rack is powered by 115/230 Vac or by 12Vdc.

The Nor850-MF1 rack is delivered with a selectable number of measurement channels, and may be upgraded with additional channels as the needs grow. Multiple racks may be used in the same system alternatively in a mix with Nor140 or Nor150 Sound Level Meters as additional frontends. Optionally, selected channels may be fitted with signal generator outputs.

Example of configuration




Nor850-MF1

Building Acoustic Mode

The basic Building Acoustics application package includes all required features for performing sound insulation tests in the field. Both the traditional ISO 140 Standards as well as the new ISO 16283 Standards are included, plus national varieties of these. The ASTM Standards E336, E90 as well as the E413 are also included.

In the extended Building Acoustics package the more advanced laboratory test such as ISO 10140 as well as ASTM E1007, E492 and E989 are included together with absorption coefficient testing in accordance with ISO 354 and ASTM C423.

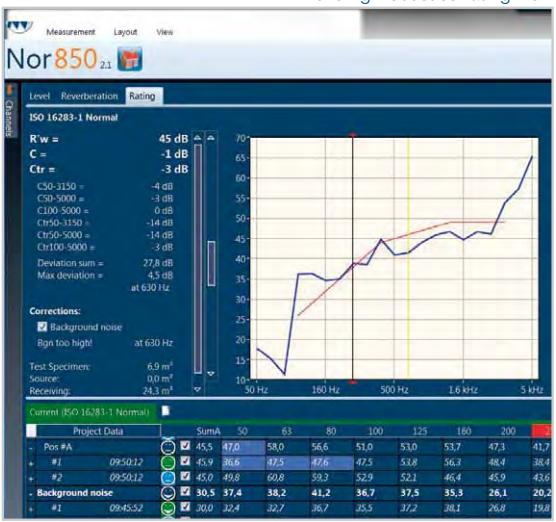
The signal generator offers white, pink or bandpass filtered noise even with user defined pre-excitation of the measurement chambers. The Nor850 Suite additionally offer features for automatic control of Rotating Microphone Booms, Tapping Machines as well as control of moving loudspeaker systems.

Building Acoustic level measurement view

Calculation of sound insulation indices with predefined printed reports as well as parameter input in both metric and US formats. Enhanced features for multichannel calibration procedures are available using remote displays and acoustic loudspeaker feedback.

Old measurement project from previous Norsonic analysers may be imported and compared with new measurements using the multi-project feature. Measurement results are re-used in new projects by easy drag&drop functionality.

Building Acoustics rating view



Building Acoustics reverberating measurement view

Sound Power Mode

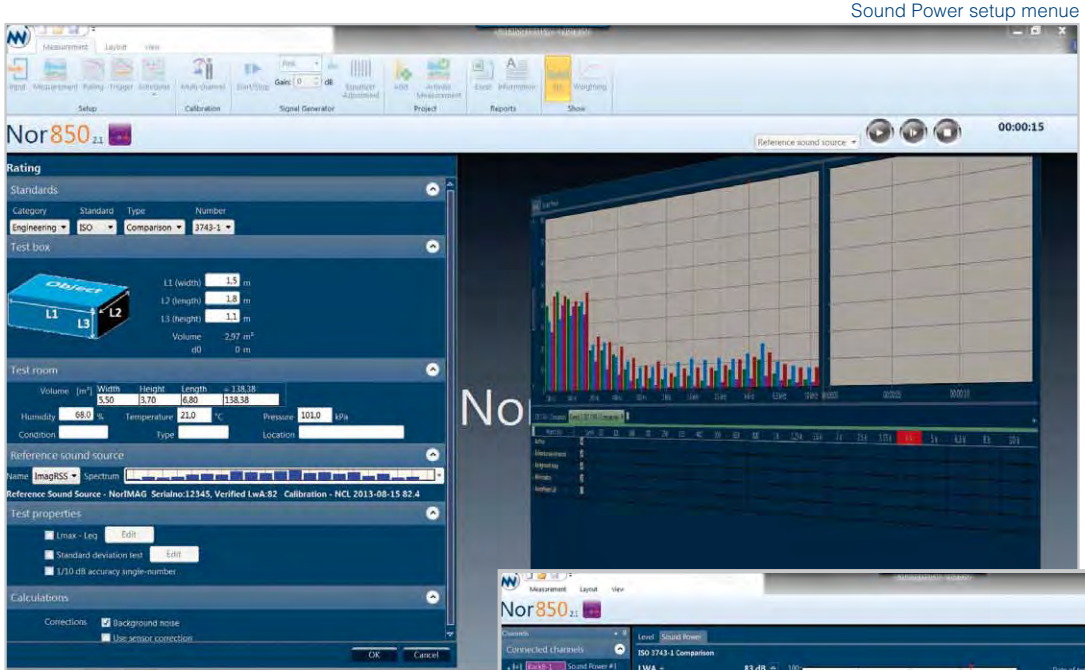
The basic Sound Power application package includes all features required for making sound power test in accordance with the various Standards in the ISO 3740 series.

The extended Sound Power application package contains required features for making more special tests such as dual-chamber testing of heat-pumps, dynamic testing of earth moving machinery, and similar. The entire test procedure may be controlled by a user defined Scheduler for easy test repetitions.

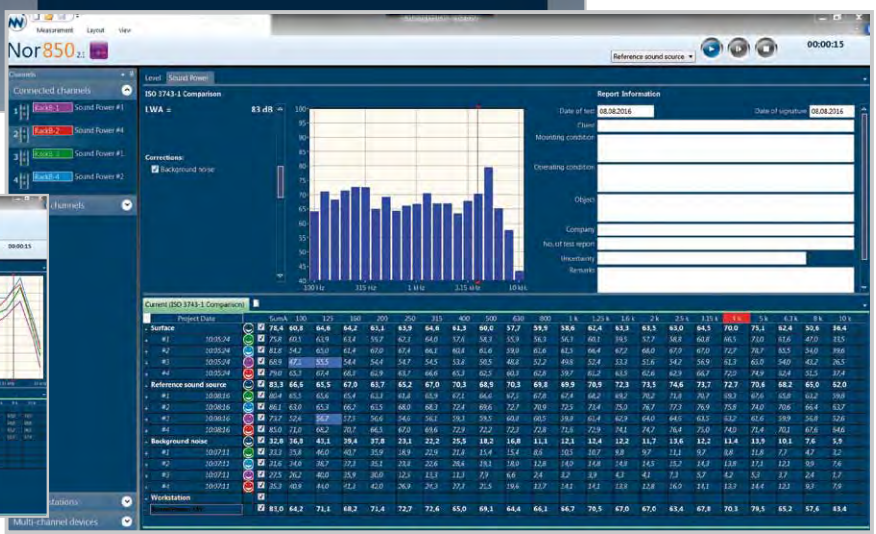
Appliance Noise Mode

The Appliance Noise application package includes the requires features to perform a full laboratory test of the ISO 3822 Noise emission from appliances and equipment used in water supply installations.

Sound Power setup menue



Sound Power measurement view



Sound Power resulting view

Available features for all modes

In the heart of the Nor850 Suite there is a sensor database containing all possible information about each user complete list of measurement transducers (microphones, preamplifiers, accelerometers, etc.) including serial numbers, product name, producer, calibration history, verification laboratories, the date of next verification, correction data, and more. The data base may also include similar data for calibrators and reference sound sources.

Logging of DC-voltage levels in parallel with the acoustic measurements is available, as well as direct read-in of temperature, humidity and pressure from external sensors.

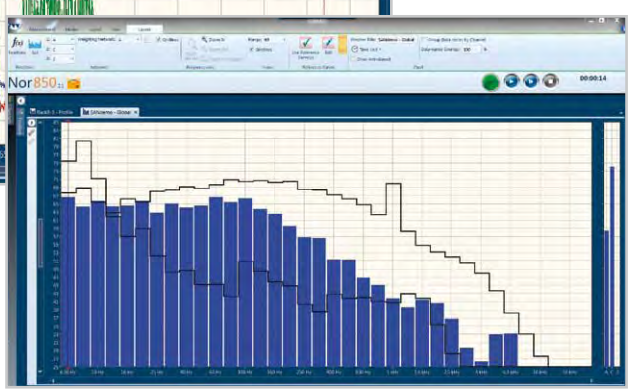
Individual units for each measuring channel offer a very high degree of operating flexibility. It allows the user to operate a multichannel system one day – or many individual measuring units another day!

The multichannel system Nor850 is expanding as the needs grow. Start with the new Nor150 SLM, or two units of the standardized Nor140 SLM's, and increase step-by-step by adding additional SLM units – or mix with Nor850-MF1 Racks containing 1-10 measuring channels.

By connecting a number of individual measuring units through various communication channels – including both LAN and USB – the user may create the optimal multichannel system for any task. Wireless communication through BlueTooth or WLAN is also available.

Each individual measuring unit may be homologated by independent verification laboratories that means even the entire multichannel system may be homologated!

General Mode measurement view



QC view with reference curves

Nor850 Reporting System

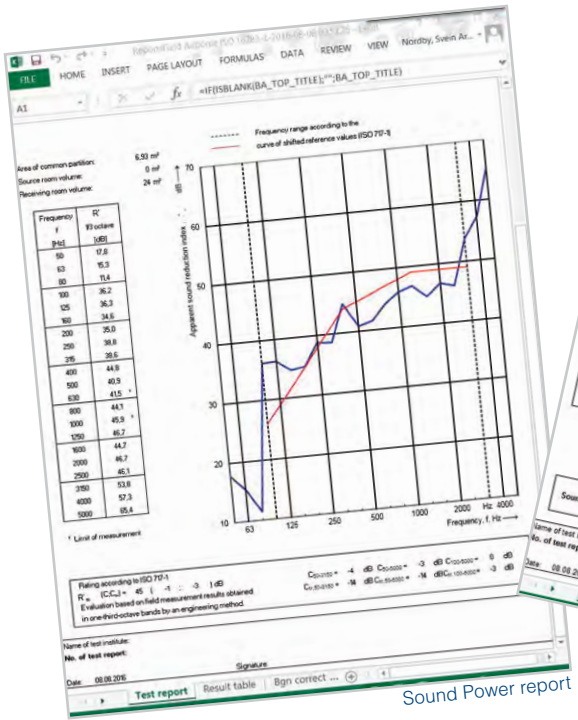
The user-friendly and innovative calculation and reporting features in the Nor850 may be used as individual modules for post-processing of individual measurement files. This feature is available for the building acoustics and sound power modes.

Measurements taken manually by use of the Norsonic sound level meters Nor140 or Nor150 are imported easily into the reporting modules. Level, reverberation or background measurement files are included into the respective table folders by simple drag&drop technique. Even complete building acoustics files containing all data in one file may be imported.

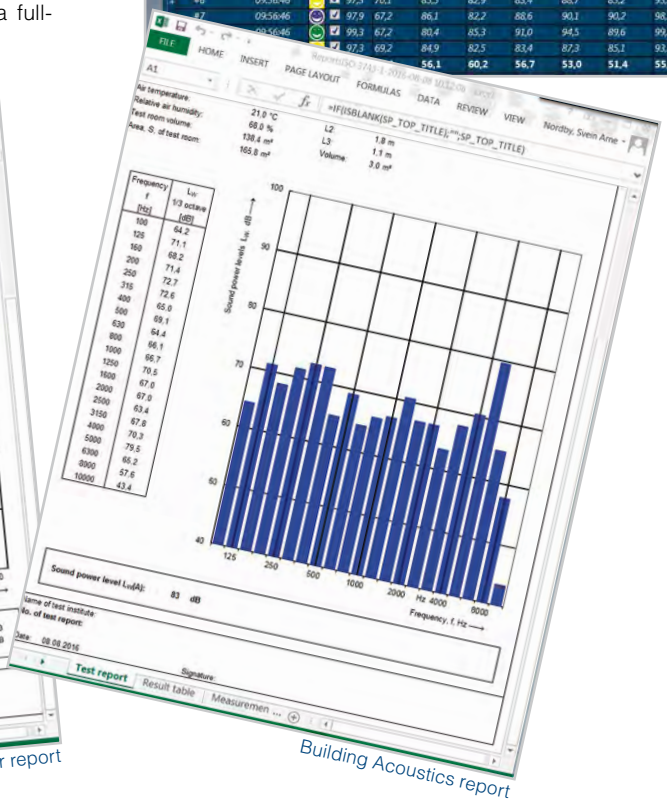
The full range of Standards for building acoustics such as the in-situ ISO 16283, laboratory ISO 10140 and the national version such as Americal ASTM Standards, are selectable. Calculation properties as well as informative text for the excel reports are inserted and edited for the final calculation of the sound insulation indices or sound power value.

Customers may enhance their Nor850 Reporting system to a full-blooded Nor850 Measurement system at any time.

Building Acoustic multi-rating view



Sound Power report



Building Acoustics report

Noise Sources

Hemi-dodecahedron Loudspeaker Nor275

- Hemi-dodecahedron noise source for field applications
- Portable noise source with omnidirectional characteristics
- Fulfils the directional characteristics required by the ISO 16283 Standard when mounted on a hard reflecting plane
- Delivers 120dB sound power level in conjunction with the Nor280 Power Amplifier over the frequency range 50 to 5 000 Hz
- Dimensions: 332 (d) × 195 (h) mm (13 x 7,6”)
  Weight 5,7 kg (12,6 lb)

Dodecahedron Loudspeaker Nor276

- Dodecahedron loudspeaker
- High power loudspeaker with omnidirectional characteristics
- Fulfils the directional characteristics required by the ISO 10140 and ISO 16283 Standards.
- Fulfils ISO 3382-2
- Delivers a continuous sound power level of 120 dB when driven with pink noise over the frequency range 50 to 5000 Hz via the Nor280 Power Amplifier
- Dimensions: 332 mm (13”) diameter. Weight 9,3 kg (20,5 lb)

Power Amplifier Nor280

- A portable power amplifier with internal noise generator for use with the Nor275, Nor276 or other suitable loudspeakers
- Specially designed for building acoustics measurements
- Lightweight and rugged construction
- Self contained noise generator
- Emits 120 dB sound power level in the 50 - 5000 Hz frequency range when used with Norsonic dodecahedron loudspeakers Nor275 or Nor276
- Wireless remote control of noise generator (optional)
- Equalization network to optimise acoustic output from speaker
- Balanced signal input for low noise and limited cross talk problems
- Dimension: 275 x 110 x 246 mm (10,8 x 4,3 x 9,7”)
  Weight 3,5 kg (7,9 lb)

Tapping Machine Nor277

- Tapping Machine for making footfall noise transmission measurements in buildings as set out in International and National Standards
- Impact sound transmission testing according to ISO 16283-2, ISO 10140, ASTM E-492 and ASTM E-1007
- Determination of single number quantity index Ln,w, in accordance with ISO 717-2 and ASTM E-989
- Remote operation from hand switch or PC
- Mains or battery operation
- Powered from 85-264 volt AC main supply. Built in Lithium Ion rechargeable batteries
- Low weight 10 kg (22 lb) incl. battery and wireless remote option
- Five hammers each having a mass of 500 g falling from a height of 40 mm (adjustable)
- Tapping sequence of 10 impacts per second, rpm controlled via servo feedback loop
- Built in self check of hammer fall speed, and tapping sequence
- Retractable feet
- Dimensions: 265 x 230 x 495 mm (10,4 x 9,1 x 19,5")

Impact Ball Nor279

Applications

- To be used as the "Rubber Ball " alternative to the Tapping Machine excitation method in accordance with the ISO 16283-2 Appendix A.2 and the ISO 10140-5 Appendix F.2
- Fulfill the requirements for a "standard heavy impact source" as given in the Japanese JIS A 1418-2:2000 Standard for impact sound insulation

Features

- Hollow sphere ball
- Outside diameter 178mm and thickness 32mm
- Silicone rubber material
- Equivalent mass 2,5 kg (+/- 0,1kg)
- Coefficient of restitution at 0,8 (+/- 0,1)
- Rubber hardness 40° (+/- 5°)

Nor265 Microphone boom

- Oscillating microphone boom for spatial averaging in building acoustics or sound power measurements
- Building acoustics measurements in accordance with ISO 10140 and ISO 16283
- Reverberation time measurements in accordance with ISO 354
- Sound Power measurements in accordance with ISO 3740 series.
- Directional response measurements of loudspeakers and microphones
- Accurate positioning
- Sweep of ±90° and ±180°
- Direct control or remote control from a PC
- User defined sweeps. Selectable sweep times
- Boom length adjustable from 0,8

Optionally, the Nor265 may be equipped with a turntable and RS-232 remote control.

Nor278 Reference sound source

Applications

- Substitution and juxtaposition methods for determination of sound power of noise sources according to ISO 3747
- Comparison method for determination of sound power of noise sources according to ISO 3741, ISO 3743-1, ISO 3744 and 3747

Features

- A-weighted Sound power output : 93dB re 1 pW (50Hz line frequency)
- Sound power 50 Hz – 20 kHz: 94dB re 1 pW (50Hz line frequency)
- Fulfils ISO 6926 for reference sound sources in the extended frequency range 50 Hz – 10 kHz
- Individually calibrated (accredited calibration optional)
- Long-term stability
- Weight 18,6 kg
- Rugged

Environmental Noise Monitoring

Norsonic offers a wide range of solutions for Environmental Noise Monitoring; from stand-alone Noise Monitoring Terminals (NMT) with local or remote access, to large scaled hosted systems with several NMTs fully automated which deliver daily reports with noise data and meteorological data to the customer.

When our customers contact us about Environmental Monitoring we first define their needs and requirements. Then we suggest a solution based on this. When the customer is satisfied with our proposal, we implement the solution.

Throughout the world on every continent we have delivered solutions for Environmental Noise monitoring. We have systems at harbours, construction sites, traffic noise monitoring, wind energy plants, race tracks, production plants, shooting ranges and airports. Some systems are run by the customer itself.

But more and more customers choose to let Norsonic host their systems. Then they can focus on their main task and key knowledge; analysing the data from the Noise Monitoring Terminals. I while we take care of the “boring stuff” like communication, configuration, backup, report generators ++.

Examples of solutions that we have delivered:

- Shoeburyness Shooting Range, UK - 7 NMTs with central server at control central
- Risavika Havn, Norway. Busy harbour area, 5 NMTs with hosted server at Norsonic main office Tranby, Norway
- Goodwood Race Circuit, UK, 3 NMTs with central server at race control. Automated daily reporting
- Stockholm City, Sweden. Monitoring of construction noise. 3 NMTs with hosted server at Norsonic main office Tranby, Norway Nor1506B

NorRemote Nor1050

The Nor150's built in web server opens up a new world of remote communication and acquisition of data from a Sound level meter. Simply connect to your instrument via LAN, GPRS or WiFi using a web browser to control, download or view the measurement in real time. The program covers all applications from downloading files to full control of your analyser, to add markers, start a recording or just check the battery status.

Connect your smartphone, pad or PC to the Nor150 or a Nor140. Photos and voice notes obtained on your smartphone or pad are seamless integrated with markers into your noise data with markers in the time profile. The Nor140 needs an external tiny PC with web server while the Nor150 uses its internal web server.

Features

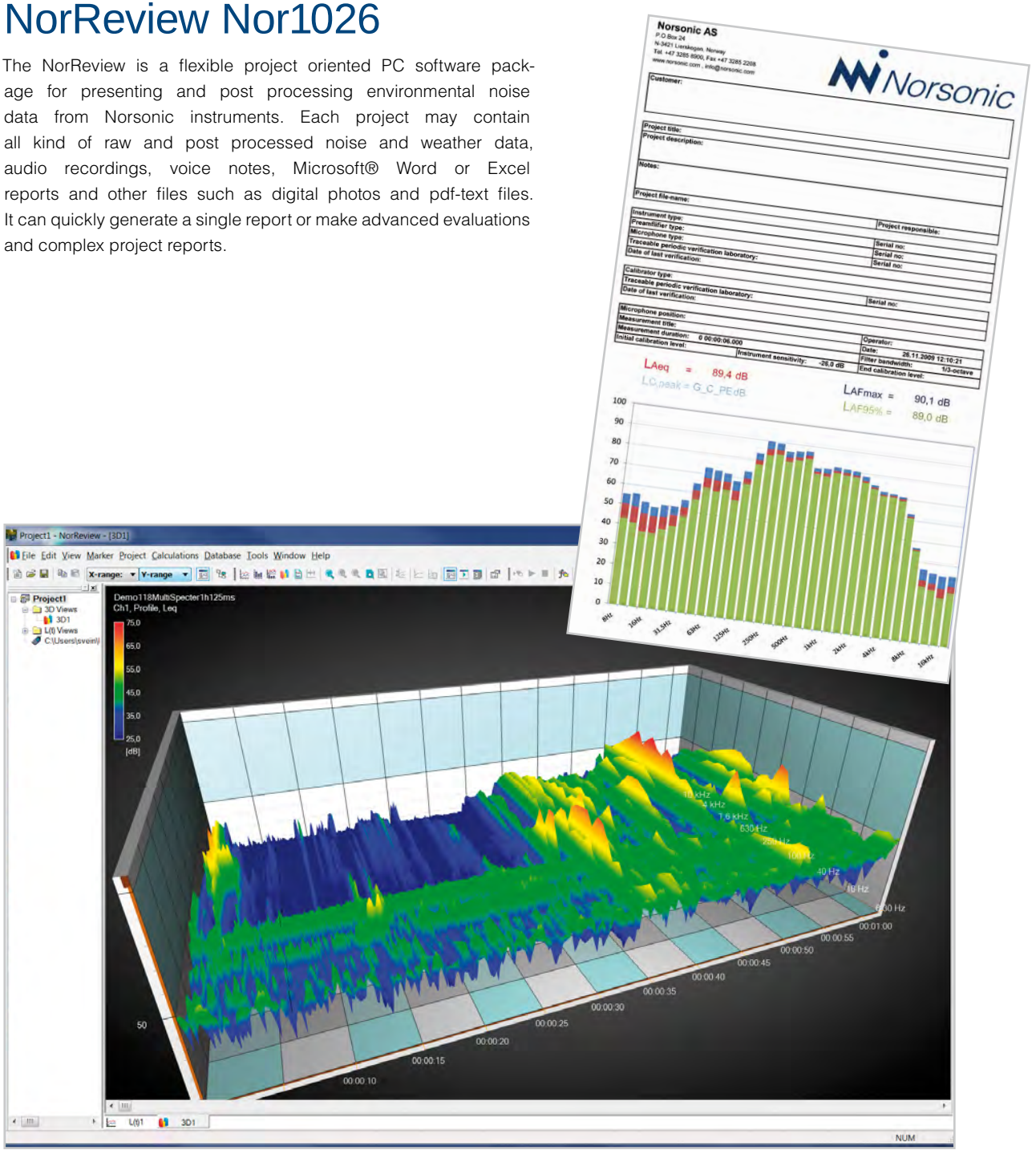
- Enables remote control of Nor150 or Nor140 from your PC, smartphone or Pad using a web browser
- A perfect measurements tool for noise assessment applications featuring on-line view, marker and trigger management and measurement configuration
- Remote configuration and data download via a web browser
- On-line view of measurement data
- Communicate with Nor150 via 3G/4G, Wlan, LAN or USB
- Seamless integration to camera

NorConnect Nor1049

A program for downloading measurements acquired on a Nor150. The program is seamless integrated with NorReview and NorReport. Thus you are just a few mouse clicks away from generating report based on a template or perform calculations in Excel or NorReview. NorConnect is freeware and is included when purchasing a Nor150.

NorReview Nor1026

The NorReview is a flexible project oriented PC software package for presenting and post processing environmental noise data from Norsonic instruments. Each project may contain all kind of raw and post processed noise and weather data, audio recordings, voice notes, Microsoft® Word or Excel reports and other files such as digital photos and pdf-text files. It can quickly generate a single report or make advanced evaluations and complex project reports.



Features

- Flexible and versatile user-interface
- Evaluation of industrial noise
- Evaluation of rail and road traffic noise
- Evaluation of residential noise
- Evaluation of multiple measurement files simultaneously
- Direct import or file read-in from Norsonic instruments
- Displays frequency, time-profile, FFT and AC views of the measurement data
- Insert and edit markers to recognize noise sources
- Replay of audio recordings with dynamic cursor and marker insert features
- Post processed event analysis with marker insert feature
- Post processed calculations on selected pre-marked sections
- Rating calculations according to national standards
- Pre-defined project reports
- L(t) view of calculated functions
- L(f) view difference calculations
- User-defined project reports
- Supports weather data
- Online view of measured values from several instruments in conjunction with Nor1022 NorMonit
- New MS' Excel template based NorReport measurement report feature
- Sophisticated 3D and Spectrogram views
- Automated multi-views of long-term measurements in pre-selected detailed sub-periods (24 x 1 hour views of a 24h measurement)
- Overlay marker
- Simultaneously transfer of all views to Word
- Connected cursors Lt/Lf views
- Calculation of difference between selectable functions

Outdoor microphones

Norsonic offers a broad range of microphone solutions for permanent and semi-permanent installations.

Nor1210 for permanent installations

- Permanent outdoor microphone for community (Model C) and aircraft noise (Model A)
- Built-in electrostatic actuator calibration
- Fulfils IEC 60651, IEC 61672 class 1 and ANSI S1.4 type 1
- Type approved by PTB, Germany
- Low self noise – typically below 20 dB, A-weighted

Nor1216 for permanent installations

- Outdoor microphone for community and aircraft noise
- Fulfils IEC 60651, IEC 61672 class 1 and ANSI S1.4 type 1 (frequency correction applied)
- Protection class IP 55 (dust and water)
- Easy to calibrate with a normal ½" sound calibrator
- Microphone verification by SysCheck facility
- Low self noise – typically below 17 dB, A-weighted
- Delivered with individually calibration certification.
- Built-in heating for enhanced weather protection
- Directly powered and supported by Nor140 or Nor150 (built-in selectable frequency correction networks, heater supply and SysCheck signal generator)
- Type approved by PTB, Germany

Nor1210

Nor1216

Nor1217

Nor1218

Nor1217 for temporary installations

- Outdoor microphone for community and aircraft noise
- Directly powered and supported by Nor140 or Nor150 (built-in selectable frequency correction networks, SysCheck signal generator)
- Fulfils IEC 60651, IEC 61672 class 1 and ANSI S1.4 type 1 (frequency correction applied).
- Protection class IP 55 (dust and water)
- Easy to calibrate with a normal ½" sound calibrator
- Microphone verification by SysCheck facility
- Low self noise – typically below 17 dB, A-weighted
- Low cost - uses microphone and preamplifier supplied with Nor140
- Type approved by PTB, Germany

Nor1218 for temporary installations

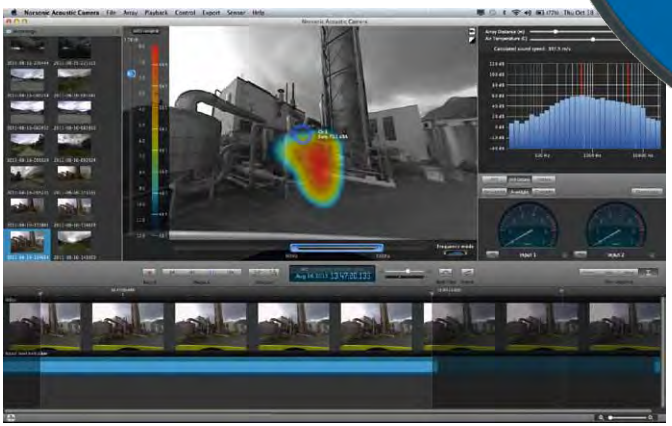
- Outdoor microphone for community and aircraft noise
- Directly powered and supported by Nor131/Nor139 (built-in selectable frequency correction networks
- Fulfils IEC 60651, IEC 61672 class 1 and ANSI S1.4 type 1 (frequency correction applied)
- Protection class IP 55 (dust and water).
- Easy to calibrate with a normal ½" sound calibrator.
- Low self noise – typically below 17 dB, A-weighted.
- Low cost - uses microphone and preamplifier supplied with Nor131/Nor139

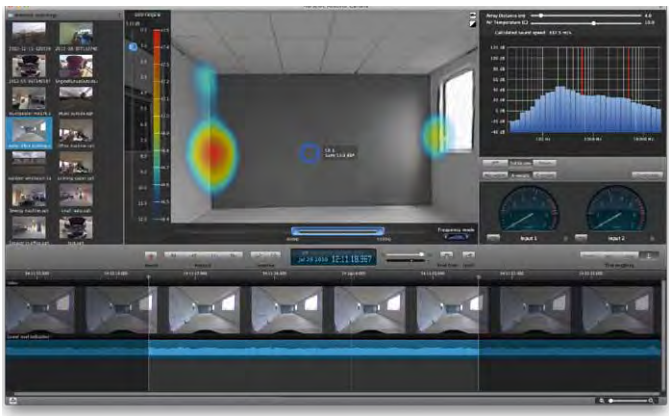
Outdoor microphone selection chart	Nor1210A	Nor1210C	Nor1216	Nor1217	Nor1218
Permanent	√	√	√		
Semi-permanent				√	√
Actuator verification	√	√			
SysCheck verification			√	√	
Designed for Nor131/Nor139					√
Designed for Nor140/Nor150			√	√	√
IEC 61672 class 1 horizontal incidence (Community)		√	√	√	√
IEC 61672 class 1 vertical incidence (Airport)	√		√	√	√

Acoustic Camera Nor848A

Applications

- Sound source identifications.
- Sound leakage.
- Automotive.
- Industry.
- Environmental noise.
- Building acoustics.





Features

Nor848A system is easy to set up in the field. Just power the self-contained unit from mains or battery and connect the LAN-cable to the computer. A typical set-up time is less than ten minutes.

The sound signal from every microphone as well as the video from the integrated optical camera are recorded and stored in the computer. Both live intensity plots as well as post-processed analysis are available with the user friendly software package that runs on the state-of-the-art MacBook Pro computer.

- Robust camera front-end based on a circular carbon fibre disc, three sizes available:
  - 128 microphones 0.4 meter array, only 2.5 kg weight
  - 256 microphones 1 meter array, only 11 kg
  - 384 microphones 1.6 meter array for lower frequency analysis
- The high number and the optimal distribution of the microphones suppress ghost-spots and ensure that the spatial mapping range is up to more than 25 dB
- No need for a separate signal processing interface box as all interfaces to the digital microphones enclosed in the microphone housing. Simple connection to the laptop computer through a simple LAN-cable
- Operated on mains or 12Vdc input
- User friendly software with all required functions for overall and detailed analysis of complex noise situations based on optimized beamforming algorithms
- Overall, 1/1-octave, 1/3-octave, FFT and spectrogram analysis available
- Colour intensity plots based on level and frequency
- Selectable upper and lower frequency limits
- Live analysis
- Zoom feature defines the area for analysis
- Select the focus point by the cursor and listen and analyse the sound from a virtual microphone position – even in real time
- Suppress interfering sources by using the acoustic eraser function
- Direct output of analysing views to PDF report
- RPM and order analysis option
- Select single episodes from recording with easy to use video editing features
- Post processing for higher precision calculations
- Competitive price!

Nor133 & Nor136 Vibration meter

Applications and features

- Designed in accordance with ISO 8041
- Whole body vibration to ISO 2631
- Hand Arm vibration to ISO 5349
- Building Vibration measurement
- Ship cabin vibration measurements
- Graphical and numerical display of all channels simultaneously
- Huge memory capacity with SD memory card
- Records the raw data signal for analysis in NorVibraTest
- Complete range of accelerometers for HA and WB measurements
- Support for use of passive geophone Nor1292

Nor1038 NorVibraTest

Features

- Post-processing software
- Calculation of all weighted features for multi-file measurements
- Displays weighted and un-weighted time signal, frequency spectrum, power density
- Handles up to 6 measured vibration channels and one noise channel

Nor1286 - Triaxial seat pad accelerometer

Nor1287 - Triaxial miniature accelerometer
Nor1270 - General purpose single axis accelerometer
Nor1288 - Triaxial accelerometer

Nor1292 - Triaxial Velocity Sensor (Geophone)

Nor135 SoundBox

The Nor135 SoundBox is a front end featuring the same hardware and analysing software as in the Nor131.

It is mainly designed to be used as a frontend for the Nor1037 NorConcertControl software. This program is designed for reporting the sound level in discotheques, concerts and at outdoor events.

The NorConcertControl system confirms to the relevant parts of the EU regulative 2003/10/EC - Noise at work, DIN 15905-5 and the Swiss SLV 2007.

The SoundBox may also be used as a general frontend controlled via the USB port.

The unit has a built in IEPE power for microphone and preamplifier assembly. Both type 1 and type 2 pre-polarised microphones can be used.

Nor1522 system

Nor1522 is a complete measurement system for monitoring and reporting the noise level in discotheques, concerts and outdoor events.

It is simple to use, just switch on the mains, calibrate, and the system is automatically measuring and reporting the needed noise parameters. The system is based on the Nor135, the NorConcert control program, a tiny PC and a bright colour screen.

All hosted in a rugged case for easy storing and transport. No hassle with cables and loose items.

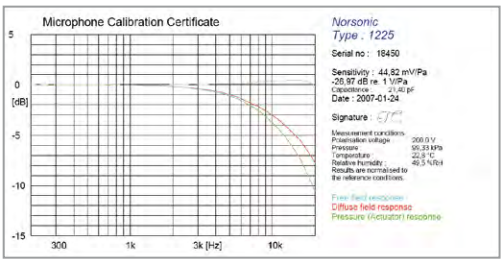
Calibration System Nor1504A

Application

- Complete system for the periodic verification of sound level meters, acoustic calibrators and measurement microphones

Features

- Allows for the acoustic, electrostatic and electrical verification of acoustic instrumentation as set out in the Standards covering Legal Metrology requirements
- Calibration of sound level meters performed in accordance with IEC 61672, part 3, IEC 60651, IEC 60804, BS 7580, DIN 45657, ANSI SI.4, ANSI SI.43
- Calibration of dose-meters in accordance with IEC 61252.
- Quick and accurate calibration of sound level meters using fully automatic, semiautomatic or manual test modes, to give the best compromise between functionality, set up time and throughput
- Frequency response calibration of measurement microphones using either electrostatic or acoustic methods
- Sensitivity calibration of measurement microphones using insert voltage methods
- Quick and accurate calibration of acoustic calibrators to the requirements of IEC 60942
- Verification of fractional octave filters as per IEC 61260 and IEC 225
- Produces complete test report and traceable calibration certificates.
- Module for logging of pressure, temperature and humidity values every 30 minutes
- Self-test application controlling the excitation signal hardware, amplifiers, filters etc.
- Supports a multitude of microphones, calibrators and sound level meters of virtually all brands. New devices to test may be added by the user through modifications of the existing library or by writing new library files


Microphone Calibration Certificate

Norsonic
Type : 1225
Serial no : 18450
Sensitivity : 44,82 mV/Pa
-26,97 dB re. 1 V/Pa
Capacitance : 21,40 pF
Date : 2007-01-24
Signature :

Measurement conditions:
Polarisation voltage : 200,0 V
Pressure : 95,33 kPa
Temperature : 22,8 °C
Relative humidity : 49,5 %RH
Results are normalised to the reference conditions.

Free field response
Diffuse field response
Pressure (Actuator) response

5
0
[dB]
-5
-10
-15
300
1k
3k [Hz]
10k


Sound Calibrator Certificate

Calibrator : Norsonic Type 1253

Serial no : 27766
Level : 124,00 dB
Frequency : 251,19 Hz

The stated level is valid at reference conditions.
Calibrator signal distortion : 0,25 %
Short term level stability : 0,02 dB

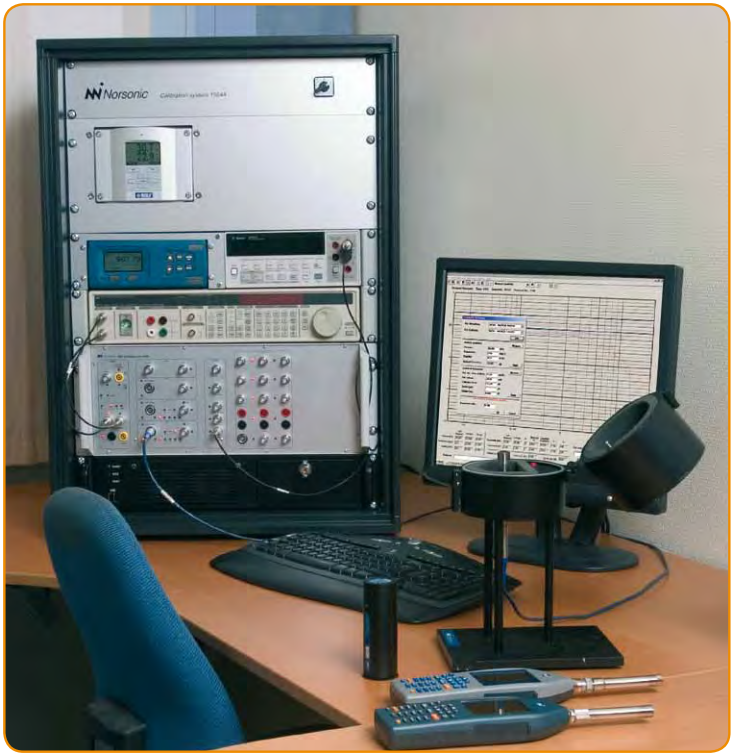
Measured according to IEC 60942.
The stated level is relative to 20uPa.
The level is traceable to PTB, Germany,
with a calculated uncertainty less than 0,10 dB (2+sd).

Reference conditions:
Pressure : 101,325 kPa
Temperature : 23,0 °C
Relative humidity : 50 %RH

Measurement conditions :
Pressure : 98,13 kPa
Temperature : 21,6 °C
Relative humidity : 49 % RH

Date : 2007-03-15
Signature :

Norsonic AS



Airflow Resistance Measurement System Nor1517A

Applications and features

- The Nor1517A system measures the airflow resistance in porous materials
- Standards: ISO 9053/DIN EN 29053 (replaces DIN 52213)
- Quality control in production process
- Testing in research and development
- Fast and accurate measurement and readout of measurement results
- Accepts test material of various form and size
- Easy setup and use
- Large dynamic range of measurement
- Measures at 2 Hz
- Measurement range: 10 Pa s/m to 30 000 Pa s/m, up to 200 000 Pa s/m when correcting for non-linearities
- The piston can be set for 2 different stroke lengths: 28 mm and 2,8 mm giving airflow speed 0,5 mm/s or 5 mm/s ms)
- Effective diameter for test: 100 mm

Accessories included:

- Calibration disc
- Sample holders 1517A/01 and 03
- Sound level meter Nor140 with microphone, sealing device and 1/3 octave filters

Accessories not included:

- Norsonic may deliver other mountingdevices for test materials on demand

Calibrators

Precision sound calibrator Nor1251

- Self compensating precision class 1 acoustic calibrator!
- Fully certified and individual accreditated calibrated to international standards
- Automatically adjusts for changes in the load volume applied to the calibration cavity thereby removing the need for the manual correction of the level for the effective volume of different types of microphone
- Compensates for changes in temperature, humidity and barometric pressure to remove the need for manual corrections for these parameters
- Output level 114.0 ± 0.2 dB @ 1kHz
- Meets the requirements of IEC 60942 class 1
- Automatically switches off when the microphone is removed from the calibration cavity
- Accepts 1", ½" and ¼" cartridges by means of adaptors
- Powered by a standard 9 volt battery
- Dimensions 40 × 109.5 mm
  Weight 185 g incl. battery
- Accreditated calibrated

"Class 0" sound calibrator Nor1253 – the electronic pistonphone

Nor1253 was designed to comply with the class 0 requirement in the international standard for sound calibrators IEC 60942 (1997). The standard is now been replaced by a new version (2003) without this class of performance.

The calibrator is widely used as a replacement for a pistonphone - without the need for correction for the barometric pressure.

- Automatically adjusts for changes in the load volume applied to the calibration cavity thereby removing the need for the manual correction of the level for the effective volume of different types of microphone
- Compensates for changes in temperature, humidity and barometric pressure to remove the need for manual corrections for these parameters
- Output level 124 ± 0.15 dB @ 250 Hz ± 0.2 %
- Other frequency and other output level can be supplied as factory preset settings
- Meets the requirements of IEC 60942 class 1
- Automatically switches off when the microphone is removed from the calibration cavity
- Accepts 1", ½" and ¼" cartridges by means of adaptors
- Powered by a standard 9 volt battery
- Dimensions 40×109.5 mm
  Weight 185 g including battery
- Accreditated calibrated

Approved by:
- PTB Germany
- LNE France
- CEM Spain
- BEV Austria
.....and others

Accessories

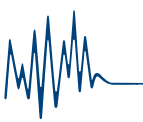
Norsonic have wide range of accessories.

For detailed information please check out www.norsonic.com.

- Microphones and preamplifiers
- Tripod adaptors and calibration adaptors
- Cases and carrying bas for our different instruments
- Interface cables/adaptors
- Microphone cables and related accessories
- Microphone windscreens
- Power supply, adaptors, battery packs
- Tripod and stands
- Various products

Notes

Notes



Norsonic

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Innovative sound instrumentation