Norsonic

Product Range Catalogue

2024-2025

Innovative sound instrumentation

Norsonic is a leading manufacturer of precision measurement instruments for sound and vibration applications. Our products have, since the very beginning in 1967, been developed in close co-operation with our customers.

By careful attention to the user's requirements, it has been possible to increase the complexity of the instrument yet preserve a user interface that is convenient and easy to understand.

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 years 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 to secure that the 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 IEC 61672, are carried out before the products leave the factory.

Nor283 dodecahedron loudspeakers and Nor282 power amplifiers ready for shipment.
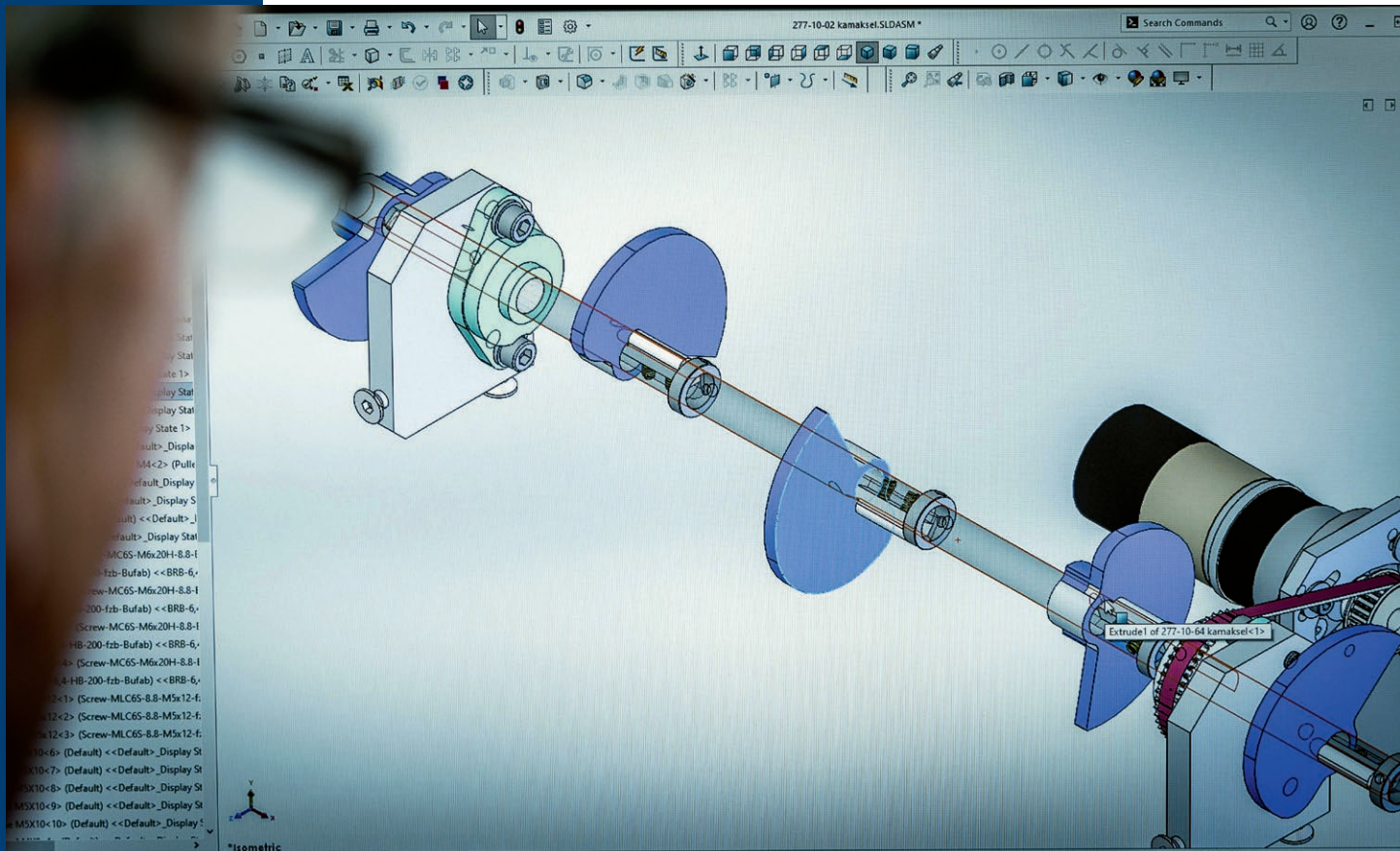
We use 20% of our turnover for research and development.

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.

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 to ensure that you as a Norsonic customer can keep your products up to date for many years after your initial purchase. We are active member of the international standardisation work.

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.

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

Sound Analyser Nor145 (1-channel) Nor150 (2-channels)

The Nor145 and Nor150 sound analysers 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 sharing the same user philosophy as a smartphone.

The Nor145 and Nor150 are based on the same hardware and software platform and are in its basic configuration equal. Different emphasis has been made to optimize the use of the two models.

The Nor145 is a single channel unit optimized for easy wireless connectivity featuring a built-in 3G/4G/LTE and WLAN modem. It is smaller and lighter than the Nor150.

The Nor150 is a dual channel instrument suitable for all dual channel applications such as Sound intensity measurements and dual channel building acoustics. The Nor150 cannot be fitted with a built-in 4G/LTE and WLAN modem but can be easy interfaced to use external devices for this purpose. Further features include 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.
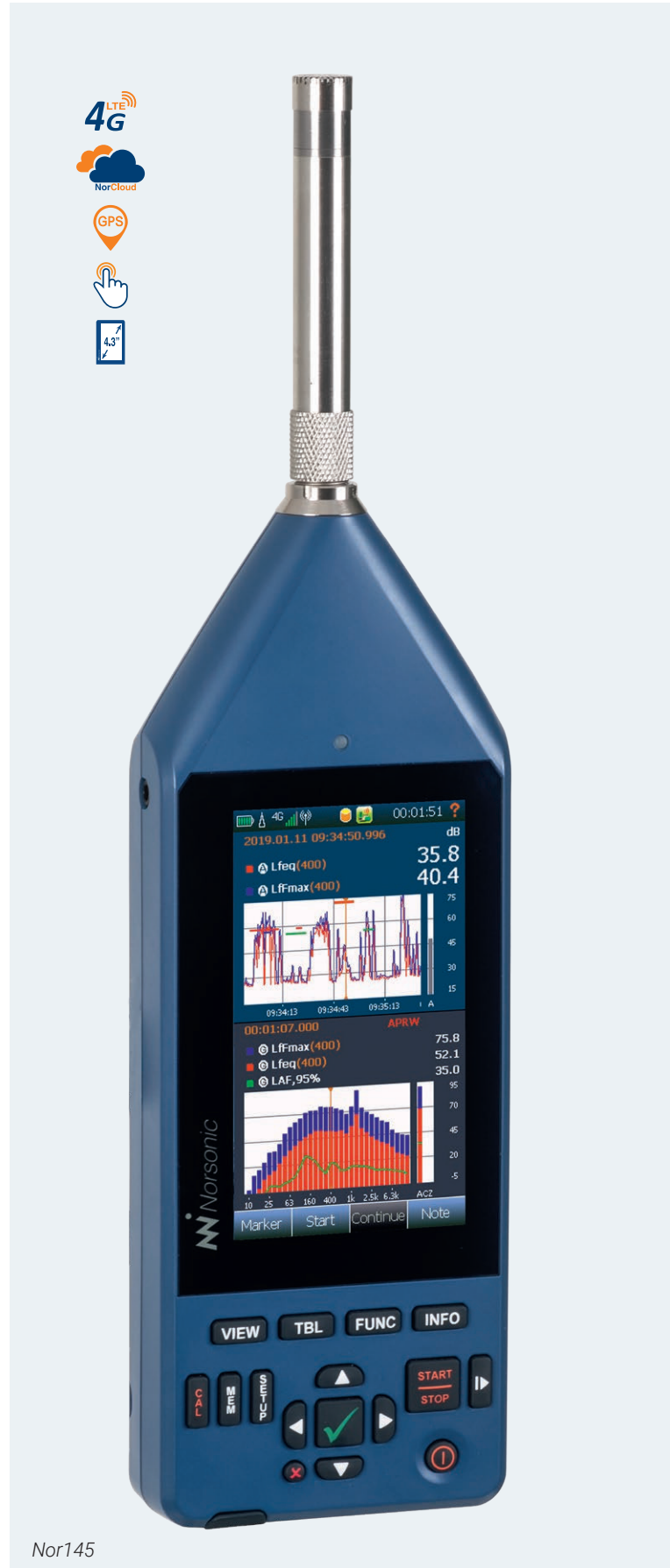
Nor145

Applications

- Environmental noise assessments
- Building acoustics
- Room acoustics - STIPA
- Sound intensity (Nor 150 only)
- Noise monitoring
- Product noise testing
- Vibration measurements
- Noise in the workplace
- Infrasound
- Ultrasound
- Noise nuisance recorder
- Front end for Nor850
- API for system integrators

Features

- Precision sound level meter and frequency analyser according to class 1.
- Easy connectivity via built in WLAN and 3G/4G. LTE modem (Nor145).
- Dual channel (Nor150 only).
- Large colour touchscreen (4.3").
- Real push keys for quick operation in challenging environments.
- Intuitive user interface with graphical icons for selection of measurement mode and custom-made user setups.
- Voice, text notes and built-in GPS for documentation of the measurements.
- Wide frequency range (0,4 Hz – 40 kHz in 1/3 octave band and FFT).
- Parallel 1/3 octaves and FFT analysis.
- 120 dB measurement range.
- Extensive trigger system for reports, audio recording and camera.
- Seamless integration with Nor850 software.
- Multi language support.
- Extensive on-board help system.
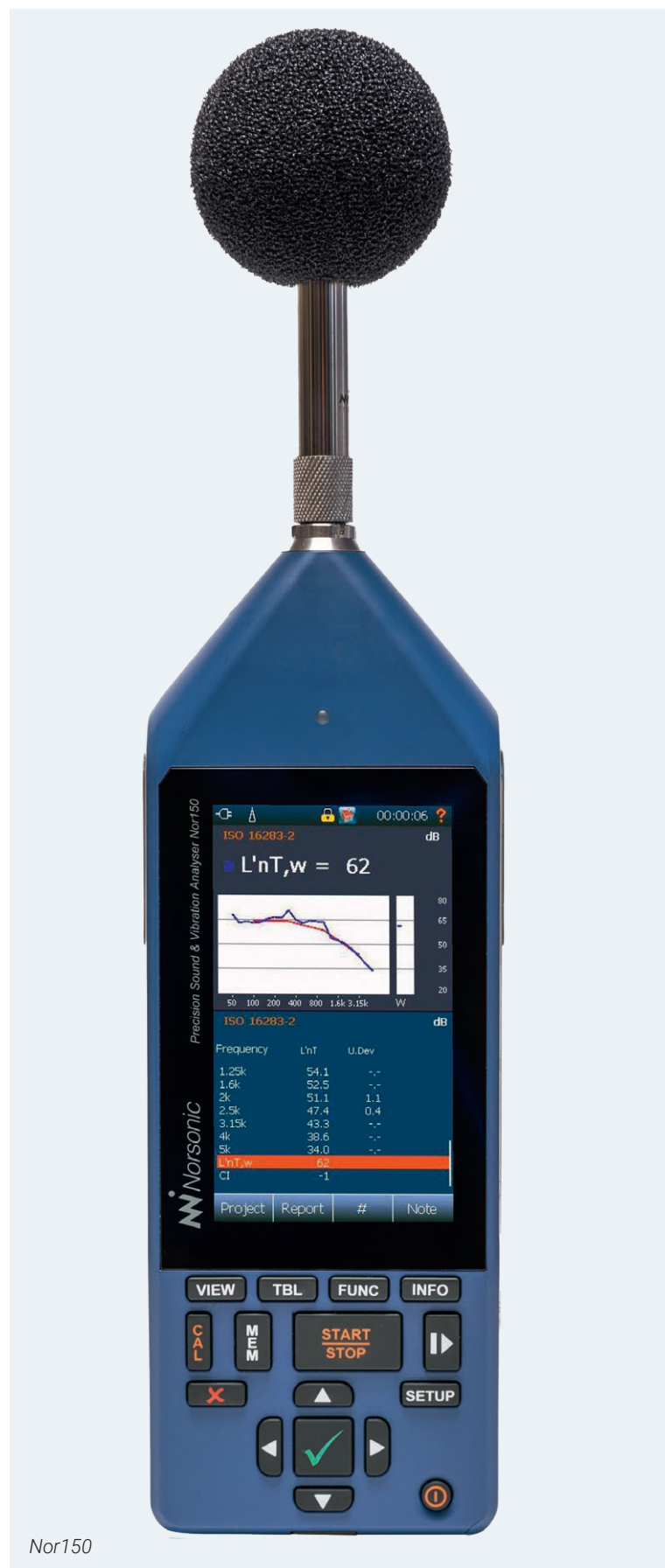
Nor150

Sound Level Meter

Environmental Analyser
Nor145 / Nor150

Both units are ideal for all type of environmental noise measurements, attended or unattended, single or dual channel measurements. The Nor145 with its build in 4G/LTE modem features and easy connectivity to NorCloud and are for most environmental applications a preferred choice due to its built-in modem.

Both meters are ideal for all types of environmental noise measurements, permanent, semi-permanent, attended or unattended. Measurements with markers, audio recordings and event triggered pictures are easily made. The large 4.3" display gives you all the necessary information. Up to 60 measurement parameters may be logged simultaneously.

For attended measurements a sophisticated marker management system with up to 10 user defined markers eases post processing and reporting. 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 in the Nor150 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 NorVirtual smart phone App connects seamless to the instrument and gives the user full remote access to 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 instruments event trigger.

Both instruments are easily connected to NorCloud, our noise monitoring control and reporting software. Easy to use for both short- or long-term unattended monitoring.

Features

- Twin time profiles with resolution from 5 ms and additional Moving report with trigger possibility.
- Extensive trigger system for reports, audio recording, camera and digital output lines.
- Voice, text and picture notes.
- 5 independent event triggers (LDEN support)
- Automatic detection of impulsive noise (ISO/PAS 1996-3:2022).
- Advanced marker management.
- Full remote-control support via NorVirtual app for smartphones.
- Seamless connection to NorCloud for unattended monitoring and reporting.
- 0-20 sec graphical back erase / pause function.
- 0-120 sec Audio pre-trigger.
- Seamless integration to post-processing programs and Excel.
- API interface for system integrators.

Sound Level Meter

Sound Intensity Analyser Nor150

The Nor150 fitted with sound intensity option and sound intensity probe kit Nor1290 is a perfect tool for all kinds of sound intensity measurements. It is designed for easy use in all types 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. This allows the user to perform all measurements with a single hand operation. The smartphone communicates via WiFi with the Nor150. The system may also be used with the sound intensity probe directly attached to the Nor150.

Applications

- Sound Power measurements: ISO 9614, ANSI S12.12 and ECMA 160.
- Sound insulation in building and building elements: ISO 15186.
- Noise Mapping.
- Noise Source locations.

Features

- Compliant to IEC 61043 Class 1.
- Full on-board support for ISO 9614.
- Unique phase correction allows measuring 25 Hz to 10 kHz with 12 mm spacer only.
- Intuitive warning indicators.
- Measurement-based suggestions for improving results.
- Automatic measurement sequence.
- Pause and back-erase with graphical display.
- Full measurement edits support (segment exclusion, resize, retake).
- Add segment support.
- Export to Nor850 mapping and reporting software.
- Photo, text and voice annotation.
- NorVirtual app for smartphone remote control.
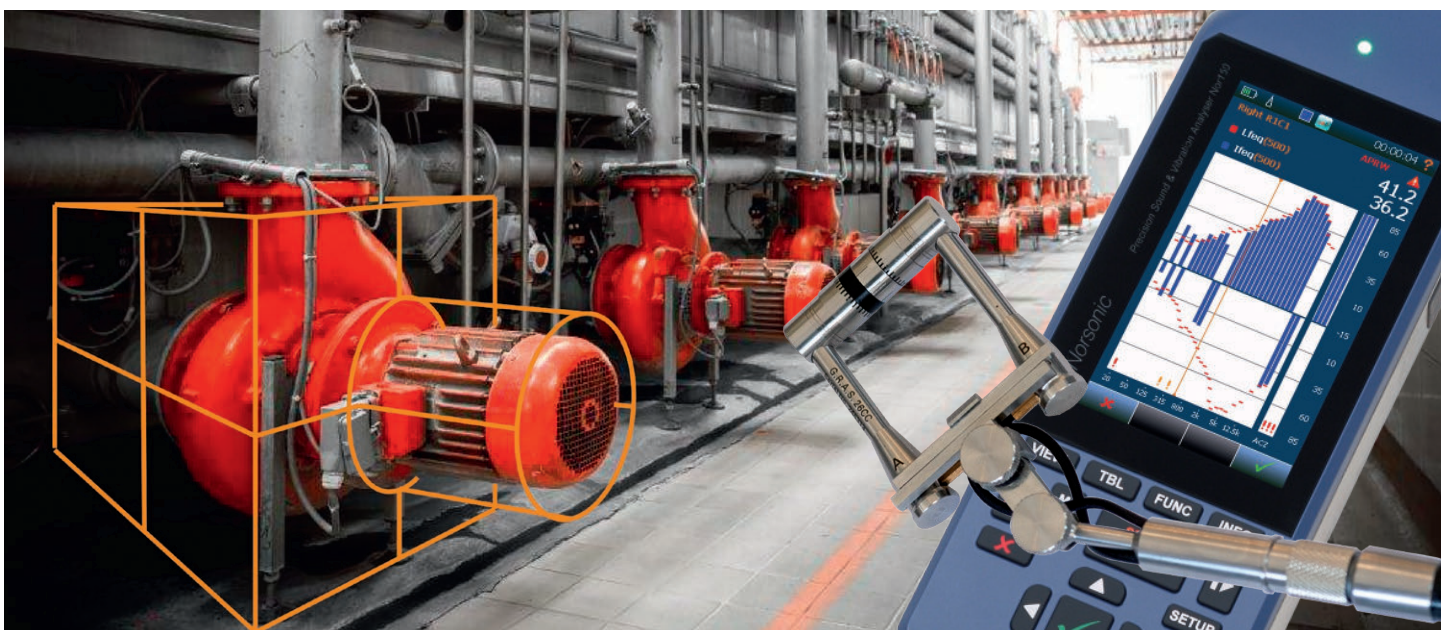
Building Acoustics Analyser Nor145 / Nor150

Norsonic continues its long-time tradition for creating the state-of-the-art building acoustic analysers.

The Nor145 and Nor150 is no exception in this respect! They can be used as a manually operated single or dual channel (Nor150) building acoustic analyser, or as a remotely controlled advanced building acoustic frontend for the Nor850 multichannel system.

The Building Acoustics mode is designed to cover any in-situ sound insulation measurement tasks. You may choose to measure airborne, facade or impact sound insulation.

Both instruments offer 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, an on-board calculation of the final airborne sound insulation indices DnT and Rw in accordance with ISO 717 is performed. Of course, the similar possibility is available for impact sound insulation index Ln,w using a tapping machine such as the Nor277.

The reverberation time excitation may alternatively be based on an impulsive source. In any case, results for T15, T20 and T30 are calculated in parallel. The analysers are 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. Complete calculation of airborne, facade and impact sound insulation indices in accordance with international and national Standards.

Features

- Reverberation time measurements with parallel calculation of T15, T20, T30, Tmax and EDT.
- Ensemble averaging of reverberation decays.
- Backward integration of reverberation decays based on impulse excitation.
- User adjustment of individual RT decay lines.
- Signal generator with white, pink or bandpass filtered noise.
- Supports multiple microphone and loudspeaker positions with corresponding on-board energetic or arithmetic averaging.
- Project overview with information about all individual measurement details and project progress.
- Seamless integration with Nor850 reporting software.
- Wireless single or dual channel measurements using one or two Nor145 controlled from Nor850.
- Wireless control of the battery-operated power amplifier Nor282.
- Rw calculation in accordance to national and international standards.

Supported Standards

- ISO 16283-1:, ISO 16283-2:, ISO 16283-3, ISO 717-1, ISO 717-2:, ISO 10052
- ASTM E336-23, ASTM E413-22, ASTM E1007-21, ASTM E989-21
- DIN 4109-4
- BS EN ISO 16283-1+A1, BS EN ISO 16283-2, BS EN ISO 16283-3
- SS 25267
- SIA 181
- I.S. EN ISO 16283-1 & A1, I.S. EN ISO 16283-2, I.S. EN ISO 16283-3

Sound Level Meter

Noise at Work Analyser Nor145 / Nor150

The Nor145 and Nor150 are the right tool for the noise at work experts. It covers all the use in one unit. You can measure traditional noise at work noise in parallel with ultrasound.

The wide frequency range covers additional applications such as infrasound 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 help 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.

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.

Features

- Ultrasound and infrasound.
- Simultaneously measurement of A, C, Z, AU weighting.
- Simultaneously measurement of SPL, LAeq, LAeqI, Peak, max, min.
- Simultaneously measurement of Fast, Slow, Impulse.
- Easy configuration of user setup creating APP shortcuts.
- Parallel detection of noise and vibration (2 ch - Nor150 only).

Sound Level Meter

Sound Level Meter Rion NL-43 / NL-53

NL-53 and NL-43 from RION is the ideal device for simple sound level measurements, e.g. in the areas of occupational safety and pollution control. NL-43 is a class 2 sound level meter and Nor NL-53 a class 1 sound level meter.

The instrument has only three buttons and is therefore very easy to use. Data is saved in open file format, but can also be evaluated in the Norsonic software.

In addition, the meters are ideal sound level meters for system integrators who want to control the device via their own software (e.g. for noise monitoring as just one of many components within a comprehensive system).

Applications

- Environmental noise assessments with markers and sound recording.
- Environmental monitoring.
- Noise hazards in the workplace.
- Product development.
- Product noise testing.
- General purpose sound level meter

Features

- IEC 61672 Class 1 Integrating Sound Level Meter - NL-53.
- IEC 61672 Class 2 Intergrating Sound Level meter - NL-43.
- Octave/third octave.
- Wav file recording.
- FFT.
- Full-fledged LAN interface.
- Data stored as CSV file to a memory card for easy import into Excel.
- Outdoor protection kit options.
- Color and touch screen.
- Very slim case.
- Use Norsonic software for evaluation of data.

Note! NL-43/53 is sold via Norsonic distributors in selected countries .

Sound Level Meter

Sound Level Meter Nor140

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.

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.
- Sound power.
- Speech intelligibility - STIPA.
- Vibration measurements.
- Noise nuisance recorder.
- HVAC noise with, NC, NR, RC rating.
- Testing of Service Equipment per ISO16032.

Features

- Audio recording onto exchangeable SD card.
- Level vs. Time with multispectrum function from 25 ms resolution.
- Frequency analysis with 1/1-octave or 1/3-octave bands in the 0.4 Hz – 20 kHz range
- 8000 line FFT.
- Pause/Continue with 10 sec back erase.
- Full support for all relevant Building acoustics standards such as ISO 10052, ISO 126283, ISO 140, ISO 717, ASTM E336 and E1007 with on screen sound insulation indexes.
- Built in Noise generator.
- Reverberation time calculations.
- ICP power for direct connection of vibration sensors.

Sound Level Meter

Sound Level Meter Nor131/132

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.

The Nor131 and Nor132 are easy to use – just push the start key and measure.

Applications

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

Features

- Single measurement range.
- Extremely simple operation.
- Parallel LAeq and LCpeak.
- Complies to IEC and ANSI standards.
- Real time 1/1 octave and 1/3 octave.
- Statistical analysis.
- Level versus time.

- Speech Transmission Index (STIPA) calculation.
- Reverberation time calculation.
- Large back-lit display.
- Large internal memory.
- USB interface.
- Multi language support.

Sound Level Meter

Sound Level Meter Nor103

Being both light weighted and ultra-compact makes this instrument very portable as it will fit in your pocket. Yet, it ensures you the same reliability and precision as other class 1 sound level meters on the market.

It features an easy interface with only 3 function keys, and a clean graphical screen displaying large fonts and a big graphical dB "speedometer".

The instrument will operate for up to 9 hours on just two AAA alkaline batteries. Delivered with a protective silicone cover and fitted with a tripod mounting thread.

Applications

- Noise hazards in workplace
- Environmental noise survey testing
- Product noise testing
- General purpose noise level meter

Features

- Class 1 Sound Level Meter IEC 61672, JIS C1509-1.
- 30 to 137 dB RMS, 60-140 dB Peak C without range switching.
- Measure Lp, Leq, Lmax, LE and LCpeak.
- Frequency range: from 10 Hz to 20 kHz.

- Frequency weighting: A and C.
- Time weighting: Fast / slow.
- Measurement durations: 1, 5, 10, 60 min.
- Quick startup.
- Easy to use!

Sound Level Meter selection chart	Nor103	Nor131/132	NL-43/-53	Nor140	Nor145	Nor150
General Sound Level Meter	√	√	√	√	√	√
Number of measurement channels	1	1	1	1	1	2
1/1 & 1/3 octave band	10 Hz - 20 k	6.3 Hz - 20 k	20 Hz - 8 k / 10 Hz - 20 k	0.4 Hz - 20 k	0.4 Hz − 40 k	0.4 Hz − 40 k
+10 dB extended measurement range				√		√
Reference spectrum				√		
Statistical calculations		√	√	√	√	√
Parallel Time constants (F/S/I)		√	√	√	√	√
Weighting networks	A/C	A/C/Z	A/C/Z	A/C/Z	A/C/Z/AU	A/C/Z/AU
Calculated networks				Δ−Leq	B/G/ User defined	B/G/ User defined
One measurement range - no gain setting	√	√	√	√	√	√
Dynamic range (RMS) (dBA)	30 - 137 dB	17/25-137 dB	25 - 138 dB	17 - 137 dB	17 - 137 dB	17 - 137 dB
Dynamic range Peak C	55 - 140 dB	45 - 140 dB	55 - 140 dB	45 - 140 dB	45 - 140 dB	45 - 140 dB
Occupational & Industrial hygiene	√	√	√	√	√	√
LAEq in parallell with PeakC	√	√	√	√	√	√
LCEq - LAEq		√		√	√	√
Compatible with NorProtector		√	√	√		
Reverberation table based on impulse excitation		√		√	√	√
Ultrasound (AU and 1/3 octave to 40kHz)					√	√
Environmental Noise Assessments		√	√	√	√	√
Level vs time resolution incl. multispectra		≥ 1 sec	≥ 10 ms	≥ 25 ms	≥ 5 ms	≥ 5 ms
Graphical L/t curve		√	√	√	√	√
1/1 & 1/3 octave band multispectrum			√	√	√	√
Audio recording			√	√	√	√
Support for SYSCHECK of microphones				√	√	√
Support for Noise compass and weather station					√	√
Impulsive and pure tone detection					√	√
Compatible with NorReview		√	√	√	√	√
Compatible with NorCloud					√	√
Noise Nuisance Recorder with remote trigger				√	√	√
Building Acoustics				√	√	√
Noise and impulse based RT with graphical curve				√	√	√
Noise generator				√	√	√
Swept sine				√	√	√
Dual channel						√
Calcualtion of rating curves				√	√	√
Sound Intensity						√
Audiometer calibration				√		
FFT			√	√	√	√
Line resolution			2.5 Hz	1.46 Hz	1.46/2.92 Hz	1.46/2.92 Hz
Upper frequency normal mode/ultrasound mode			20 kHz	9.6 kHz	24/42 kHz	24/42 kHz
1/3 octave in parallel with FFT					√	√
STIPA		√		√	√	√
Survey Sound Power measurements acc.to ISO 3746				√		
Compatible with Nor850 software				√	√	√
GPS and internal or external camera					√	√
WLAN					√	
LAN interface			√		√	√
Built-in LTE/4G modem					√	
USB	via adapter	√	√	√	√	√
Bluetooth (Via external adapter Nor520)				√		
High speed RS 232 interface			√	√	√	√
SD-card for storage - measurement and audio recordings			√	√	√	√
Internal memory storing measurements	√	√	√	√		

Note. Features and specifications given may require additional options installed.

Sound Calibrator Nor1255

- Conforms to EN/IEC 60942 : 2017 Class 1 and ANSI S1.40−2006 class .
- Ultra-stabile silicone reference microphone.
- All-digital quartz-controlled signal generator .
- Fully compensated for static pressure, humidity and temperature.
- Sound pressure independent of microphone equivalent volume.
- Robust, compact and battery operated.
- 114dB @ 1000 Hz.
- Supplied with accredited calibration certificate.

Sound Calibrator Nor1256

- Conforms to EN/IEC 60942 : 2017 Class 1 and ANSI S1.40−2006.
- Ultra-stabile silicone reference microphone.
- All-digital quartz-controlled signal generator.
- Fully compensated for static pressure, humidity and temperature.
- Sound pressure independent of microphone equivalent volume.
- Robust, compact and battery operated.
- 114 and 94 dB @ 1000 and 250 Hz.
- Built in display.
- Measurement of humidity, temperature and static pressure.
- Supplied with accredited calibration certificate.

Environmental

NorCloud Noise Monitoring System

Inexpensive but tailored and optimized for every application!

- Construction site noise
- Transport noise
- City noise
- Industrial estate noise
- Airport noise
- Harbor noise
- Racetrack noise
- Shooting range
- Outdoor concerts and venues
- Research

Noise monitoring, permanent or short term, has never been easier. Just connect your noise monitoring terminal 1545 or your stand-alone Nor145/150 to your NorCloud project, and the system will start to measure. Data is automatically uploaded to NorCloud. Create your report using the report designer or get help from your local Norsonic distributor. Automatically remove unwanted noise from your project using the noise compass – spend less time on listening to audio events.

Scalable and easy

When creating an account in NorCloud you can create and manage as many projects as you want. Projects can be created as templates which can easily be copied to other projects requiring the same setup. You can connect as many noise-monitors you like, there is no limitation. You pay per unit in use per day - no hidden costs.
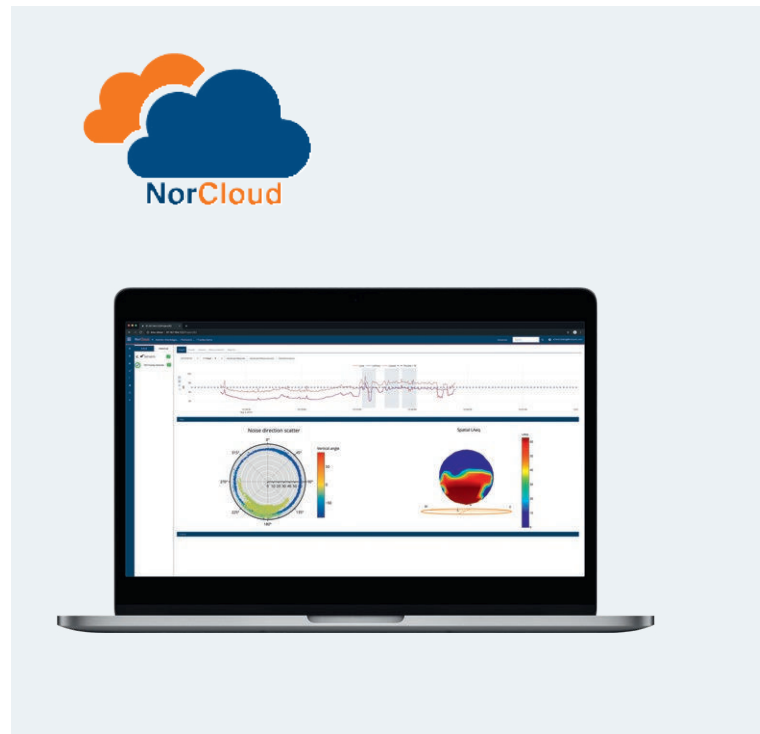
System Alarms

System Alarms helps you to monitor the health status of your projects. Alarms are generated in case of lost connection, mains failure, low battery, data transfer failure, microphone calibration failure and more.

Noise event handling

You can configure noise event alarms based on different measurement parameters, dose calculations etc. You may trigger actions like sending emails, SMS, audio recording, pictures or just set a digital output.

Measurement parameters

NorCloud supports all measurement parameters measured by the Nor145/150. From just LAeq every minute or less, to high resolution 1/3 octave multispectrum. You may just send some parameters to NorCloud and decide to store the rest on the local SD card for later data processing and cost saving.

Why NorCloud?

- Fast, easy to connect your sensor to NorCloud.
- Low cost, no software installation required.
- All data automatically uploaded to NorCloud.
- Access all your data with any web browser on any device. The site is smart phone compatible.
- Project management with measurement, trigger, and alert setups, in addition to user access control.
- Powerful report designer and generator integrated.
- View live data or download time specific measurements on the go.
- Seamlessly integrated with NorReview.
- Real time e-mail alerts sent directly from instrument.
- Protect your data. Redundant storage of data locally on the unit and in NorCloud.
- Push data to your own server.
- Norsonic reliability and support.

Continuous audio recording

The system can do continuous audio recording 24/7 with data stored locally on the noise monitor. Listen to the recordings and select what recording to upload. A data management system automatically erases the oldest data.

LDEN

The system automatically calculates and report LDEN. Penalty for impulsive noise is automatically detected in accordance with ISO1996-3.

Dose calculation

This is a tool for seeing if an equivalent sound level is in danger of reaching or reaches a certain sound level limit within a certain time span. It supports an alarm message on email when reaching the first limit (yellow alarm) and the second limit (red alarm). The dose calculation is based on an A-weighted Sound Exposure Level, LAE.

Live data

Live data can be switched on to generate real time noise data to govern noise from live events, such as racetracks or shooting ranges.
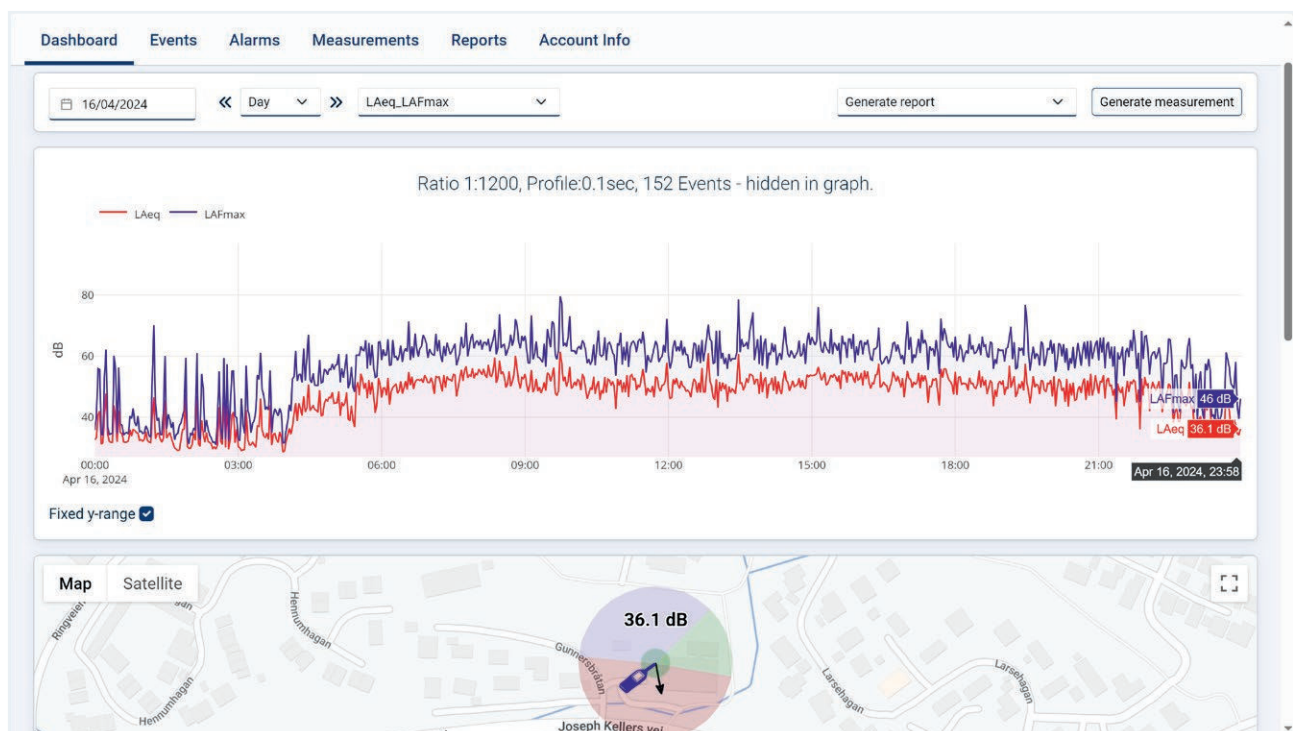
Noise compass - automatical removal of unwanted noise events

The noise compass (optional) calculates the noise emission from your predefined 3D sectors. This helps you to automatically remove unwanted noise events from other sectors than the project you manage. You may also use the noise compass data on triggers to reduce the amount of alarms or events having noise coming from somewhere else.

Reporting

Use the NorCloud report generator or Excel to make your own customized reports. Reports can be generated at fixed intervals (hour, day, workdays, week, month, year) or on demand.

Push data to a local server

NorCloud offer automatically data transfer to your server (HTTPS or FTPS). Most data formats (e.g. TXT, CSV or JSON files) are supported.

Analyze mode

Download data and work with them analytically within the browser. Use custom window setups saved as templates. Includes time graphs, pictures, frequency spectrum, spectrogram of recordings and noise compass scatter models to name a few.
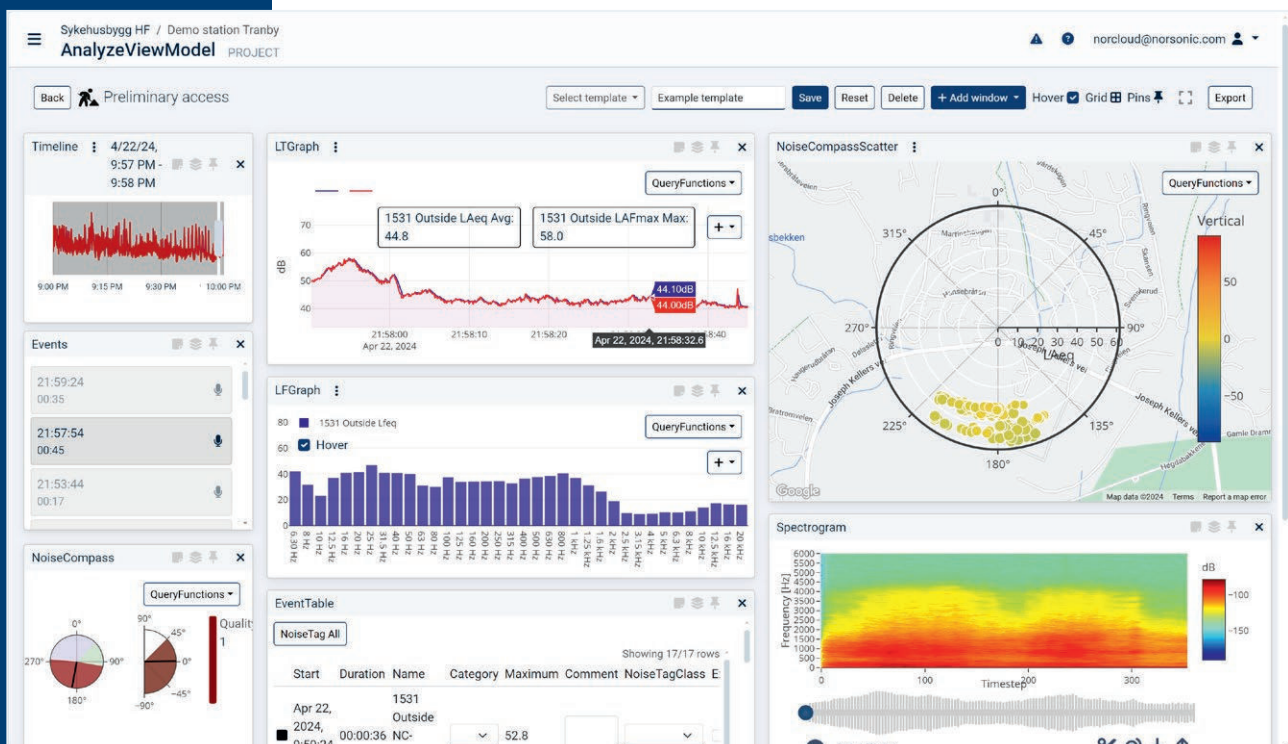
Environmental

Noise Monitoring Terminal Nor1545

Noise Compass Nor1297

The Nor1545 noise monitoring terminal is a robust, efficient solution for your outdoor noise monitoring. Equipped with the state-of-the-art sound level meter Nor145 hosting latest generation communication technology, noise data can be reliably and securely transferred to your office.

The system can be a stand-alone Noise Monitoring terminal or managed and supervised by NorCloud.

With NorReview you may perform further in-depth analyses of your noise data combined with the Noise Compass and weather data.

Features

• See and manage your noise data online using NorCloud.
• Listen to recorded events.
• Automatic reporting.
• Noise source location using the Norsonic Noise Compass.
• Support for weather data.
• Support for IP camera.
• Data stored local on SD card and in NorCloud for full redundancy.
• Wired (LAN) or wireless (WIFI/UMTS/LTE/3G/4G).
• Built in GPS.
• Get notified by email or SMS when set thresholds are reached!
• Event trigger for picture, audio and weather data.
• System alarms are generated with mains failure, battery low etc. Notification sent via e-mail.
• Support for external antennas with full diversity in places with bad signal strength.
• Interrupt free switching between mains, external 12V, Solar panel and internal 12V battery.

The three-dimensional Nor1297 Noise compass significantly reduces time spent on judging if a noise source should be a part of the overall noise calculation or not, simply by defining which direction the noise is coming from. When used together with Norsonic' s sound level meter Nor145 and Nor150 and the noise monitoring terminal Nor1545.

The noise compass provides a three-dimensional vector pointing at the sound source enabling NorCloud to automatically customize your report to include/exclude noise events based on where the sound source is located.

The system may also operate off-line and collect the data on the instruments SD card for later analyse in NorReview.

The noise compass is an add-on to the Norsonic range of outdoor microphones.

Outdoor microphones

Norsonic offers a broad range of microphone solutions for permanent and semi-permanent installations. All microphones fulfil directional characteristics for both 0- and 90-degree sound incidence when used with a Norsonic sound level meter.

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, Nor145 or Nor150 (built-in selectable frequency correction networks, heater supply and SysCheck signal generator).
- Type approved by PTB, Germany.

Outdoor microphone selection chart	Nor1216	Nor1217	Nor1218
Permanent	√		
Semi-permanent		√	√
SysCheck verification	√	√	
Designed for Nor131/Nor139			√
Designed for Nor140/Nor145/Nor150	√	√	√
IEC 61672 class 1 horizontal incidence (Community)	√	√	√
IEC 61672 class 1 vertical incidence (Airport)	√	√	√

Nor1217
for temporary installations

- Outdoor microphone protection for community and aircraft noise.
- Directly powered and supported by Nor140, Nor145 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 protection 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.

Generating reports

Measuring sound is often more than just reporting a dBA value. Most measurements are made in accordance to a standardized method requiring a report generated on a standard format, but sometimes you may need a customized report or calculations in Excel. Whatever need you have, we offer a broad range of programs that helps you to evaluate the data and generate proper measurement reports.

NorConvert & NorXfer

The NorXfer and NorConvert are programs for downloading data from the Nor13x and Nor140 range of sound level meters. NorConvert is automatically downloading and converting measurement files to Excel. NorXfer is a program for downloading and converting to Excel too, but unlike the NorConvert you have a browser feature for full freedom of selecting the measurement files to transfer. Freeware.

NorReport

A program for automatic generating customized Excel reports based on templates. The program is freeware and is as a plug-in module and works seamlessly with NorConnect, NorXfer and NorConvert. Several templates are available for various applications adapted to local national standards. You may add your own templates or just modify an existing one to optimize it for your application.
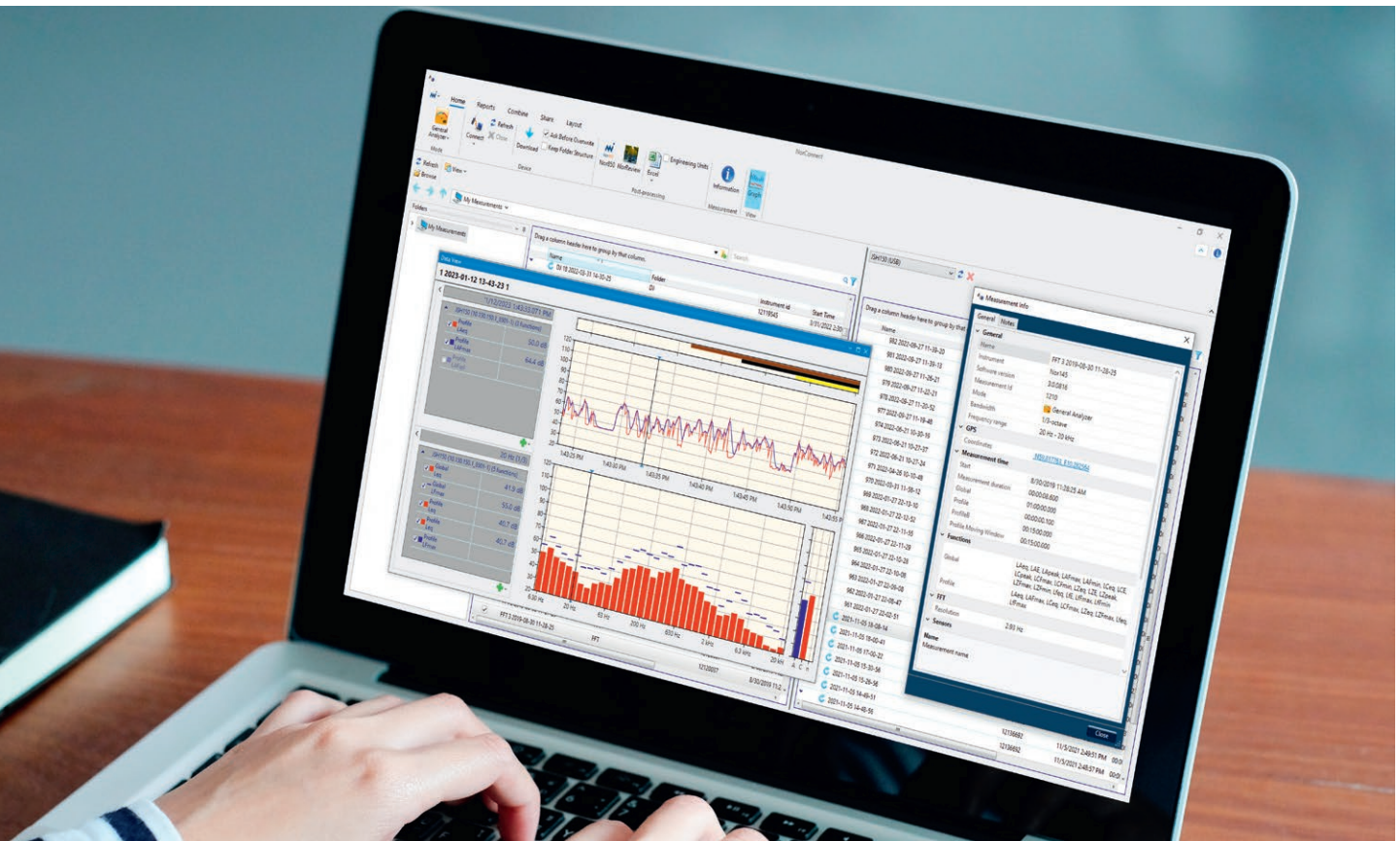
NorConnect

NorConnect is a measurement suite and data management program for measurement files downloaded from Nor145 and Nor150. The program offers a graphical and numerical viewer function of your measurements. Dependent of your measurement, optimized graphical tools are offered for building acoustic, sound power and environmental/general measurements.

You may scan through your measurements and listen to audio recordings and generate reports using predefined or your customized report templates. The program is seamless integrated to Nor850 and NorReview if a more detailed analysis is required. It also offers easy integration to Excel. The program supports all communication environments offered by Nor145/Nor150 and enables you to connect to the instrument remotely via modem, WLAN or LAN.
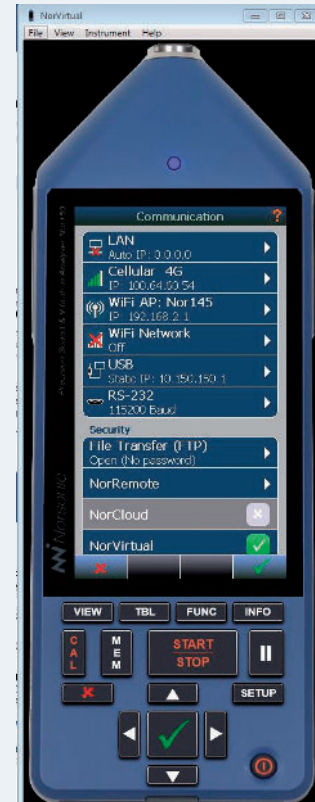
Freeware and part of the Nor145/Nor150 delivery.

NorVirtual Nor150 - PC version

NorVirtual / NorVirtual App

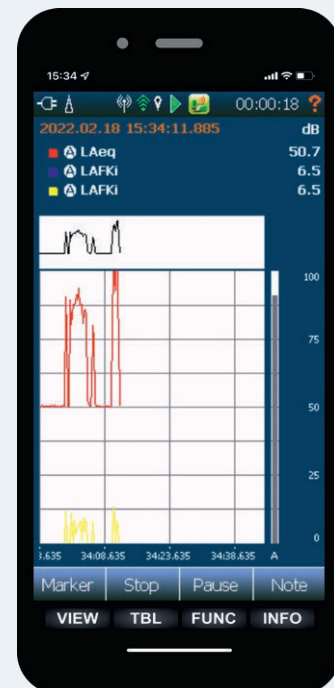NorVirtual emulates the Nor13x, Nor140, Nor145 and Nor150 on a PC. Freeware.

NorVirtual App for smartphones emulates the Nor145 and Nor150. It is a 1:1 copy of the screen and keyboard of the instrument. Whatever view the sound level meter has (graphs, menus, tables etc.), the same view is visible on the device screen. The mouse can be used to operate the virtual keyboard.

NorVirtual for Nor145/Nor150 supports all communication channels. Hence, you may connect to a Nor145/Nor150 via modem, Wlan, LAN etc and use the program as a simple remote control. In combination with NorConnect you have a simple and intuitive solution for remote control and download measurements.

NorVirtual App can be downloaded from Apple Store or Google Play.

*NorVirtual App*

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.
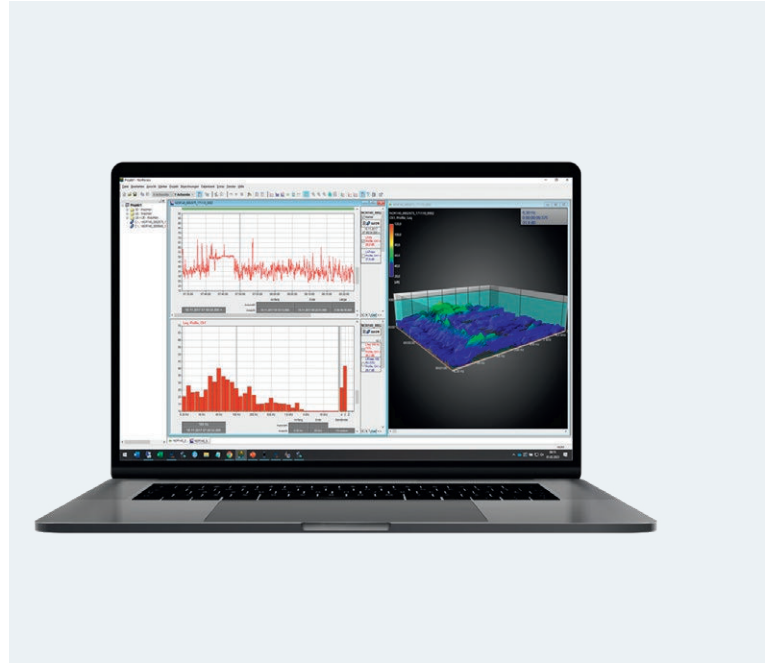
Features

- 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.
- 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.

Software

Reporting software Nor850

Create professional reports fast, accurate and easy. Instead of using your own created excel reports, spending time on maintaining it to the latest revision of standards, try out the Nor850 reporting software. This ensures you make accurate and up to date reports at a glance.

The Nor850 reporting software takes advantage of the modules used in the Nor850 measurement system but offered as individual reporting and post processing packages for

- Building Acoustic
- Room Acoustics
- Sound Power
- Sound Intensity

Measurements taken manually by use of the Norsonic sound level meters Nor140, Nor145 or Nor150 are easily imported into the reporting modules. The powerful multi project tool allows you to easily search across projects to extract and work with data from multiple projects. The Nor850 Reporting system can be upgraded to a complete Nor850 Measurement system at any time.

Building Acoustic   Sound Intensity   Sound Power   Room Acoustics

Building Acoustics

Level, reverberation and background measurement files are placed 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, ISO 717, and service equipment ISO 10052 as well as national version such as American ASTM Standards, are selectable.
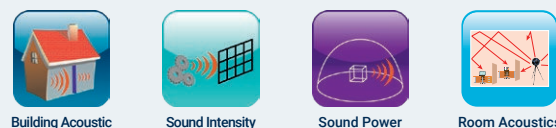
Room Acoustics

The reporting module for room acoustic supports the open plan office standards ISO 3382-2 and -3.

Sound Power

The sound power module supports the ISO 374x series of standards. 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.

Sound Intensity

The sound intensity reporting module supports ISO 9614-1 and -2 and the Sound intensity transmission loss in accordance with ISO 15186-2.

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 multi-channel system with focus on user friendliness, high efficiency and accurate reporting. The system has been designed for field testing as well as demanding accredited lab measurements.

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

General Analyser   Building Acoustic   Room Acoustics   Sound Power   Appliance Noise

Nor850-MF1

The Nor850-MF1 rack is delivered with a selectable number of measurement channels, and may be upgraded with additional channels as the needs grow. One rack can be fitted with up to ten channels. Multiple racks may be used in the same system alternatively in a mix with Nor140, Nor145 or Nor150 Sound Level Meters as additional frontends. Optionally, selected channels may be fitted with signal generator outputs.

General Analyser Mode

The General Mode allows you to make multispecter 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.

Available features for all modes

In the heart of the Nor850 Suite there is a sensor database containing all possible information about each users 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 Nor140 or 145 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.

Building Acoustics 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.

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.

Room Acoustics Mode

The new room acoustics module 850/RA offers the complete evaluation according to EN ISO 3382-2 (ordinary rooms) and EN ISO 3382-3 (open-plan offices).

The reverberation time T for the evaluation according to EN ISO 3382-2 can be measured via the impulse or noise excitation, either first in the sound level meter or directly via the Nor850 software - with wireless control of the Nor145 sound level meter and power amplifier via WLAN.

In addition to the evaluation according to EN ISO 3382-2, the Module also enables the measurement of the room impulse response using the SweptSine excitation followed by calculation of the reverberation time and speech intelligibility, as well as the complete measurement routine and evaluation for open-plan offices according to ISO 3382- 3, including generating the test report with all single values (D2,S; Lp,A,S,4m; rD, rC, Lp,A,B).

Completely wireless - no more hassle with cables!

Sound Power Mode

- ISO 374x series.
- ISO 6395.
- Customized adaptions to other standards.
- Turn-key solutions.
- Scheduler for time saving testing and increased quality.
- Wlan communication or cable from measurement points to host.

The basic Sound Power application package includes all features required for making sound power test in accordance with the ISO 374x 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 in accordance to ISO6395 and similar. The entire test procedure can be controlled by a user programable Scheduler to minimize attended test personnel and increased quality. Norsonic offers turn key solutions and customized adaptions.

Wlan communication from the measurement points may be used in larger test setup in accordance with ISO 6395 to save cabling cost.
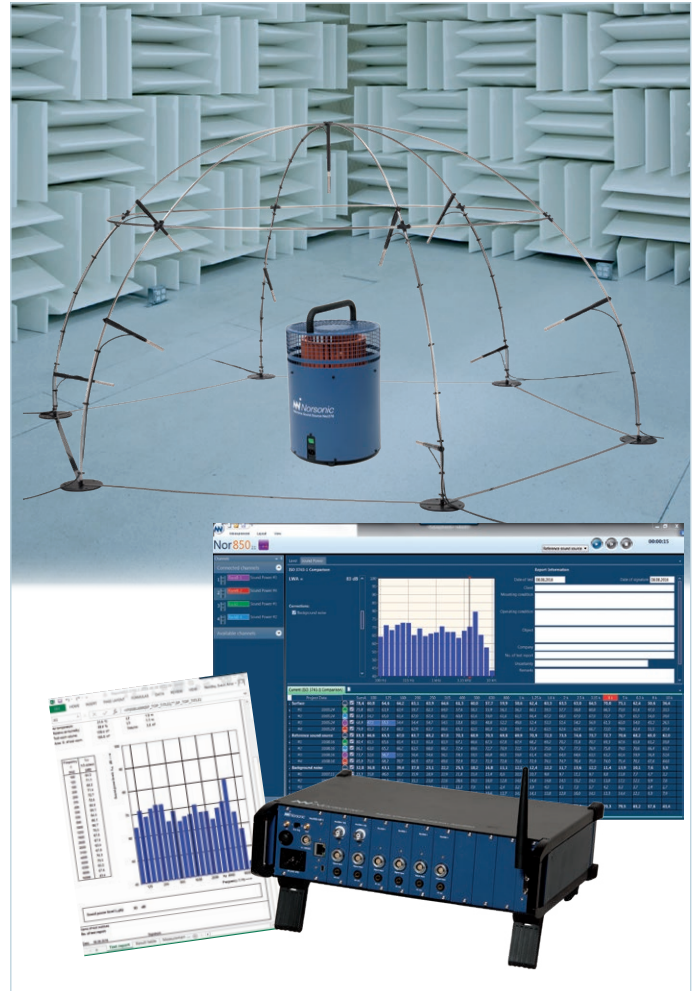
ISO 374X series measurement setup

ISO 6395 setup
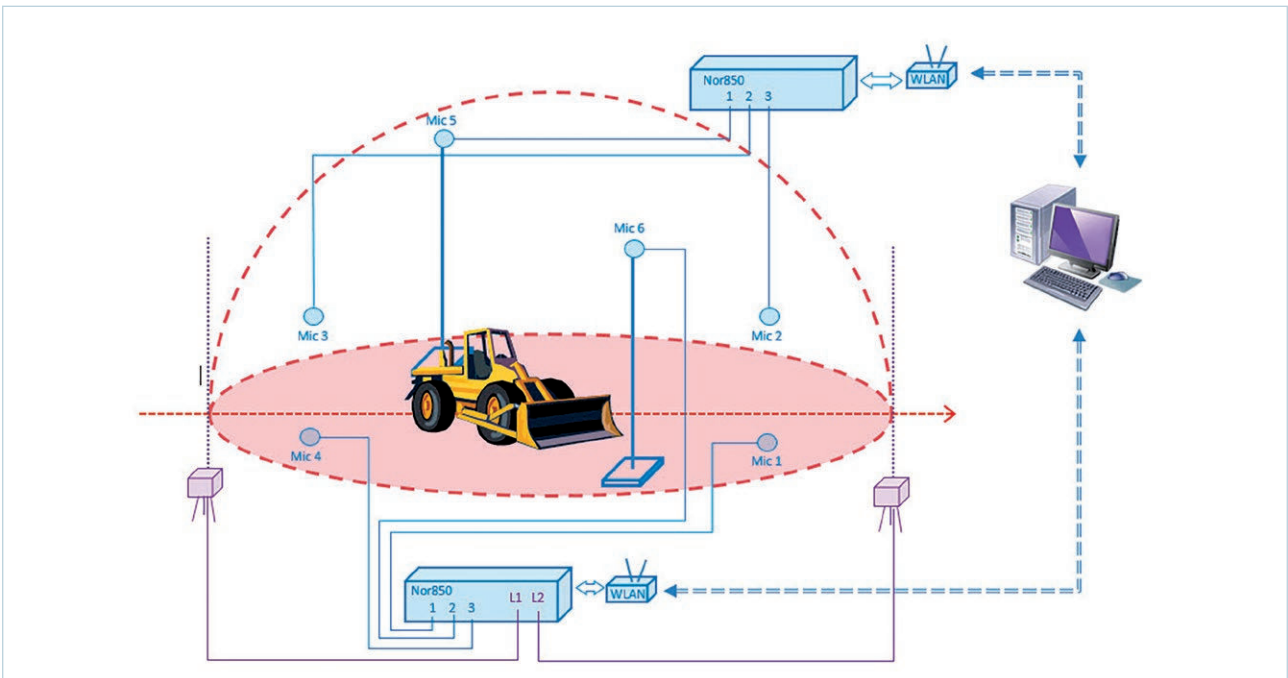
Appliance Noise Mode

Water below atmospheric pressure create vapor at lower temperature. Large pressure differences appear across small volumes of turbulent water. Here bubbles are created, and they collapse when they reach a region of higher pressure. This creates a disturbing amount of acoustic noise distributed through the tubes.

Standardized measurements are needed to compare the noise emitted from different products. The Appliance Noise application package includes the required features to perform a full laboratory test in accordance with the ISO 3822, Noise emission from appliances and equipment used in water supply installations.

The Norsonic Nor850 multi channel noise analyser is the perfect sound power measurement tool for use both in R&D and on production lines for any industry or test lab dealing with water appliances.

The optional Nor850/DC module measures water flow, water pressure, temperature, and other required parameters automatically to speed up the test.

- Highly configurable.
- Easy setup.
- Intuitive and efficient interface.
- Test Scheduler for automated processes.
- Customized report generator.
- Automatically read in of waterflow, temperature, pressure etc.
- For both experts and freshmen.
- ISO 3822 and EN 12541 compatible.

ISO 3822 setup
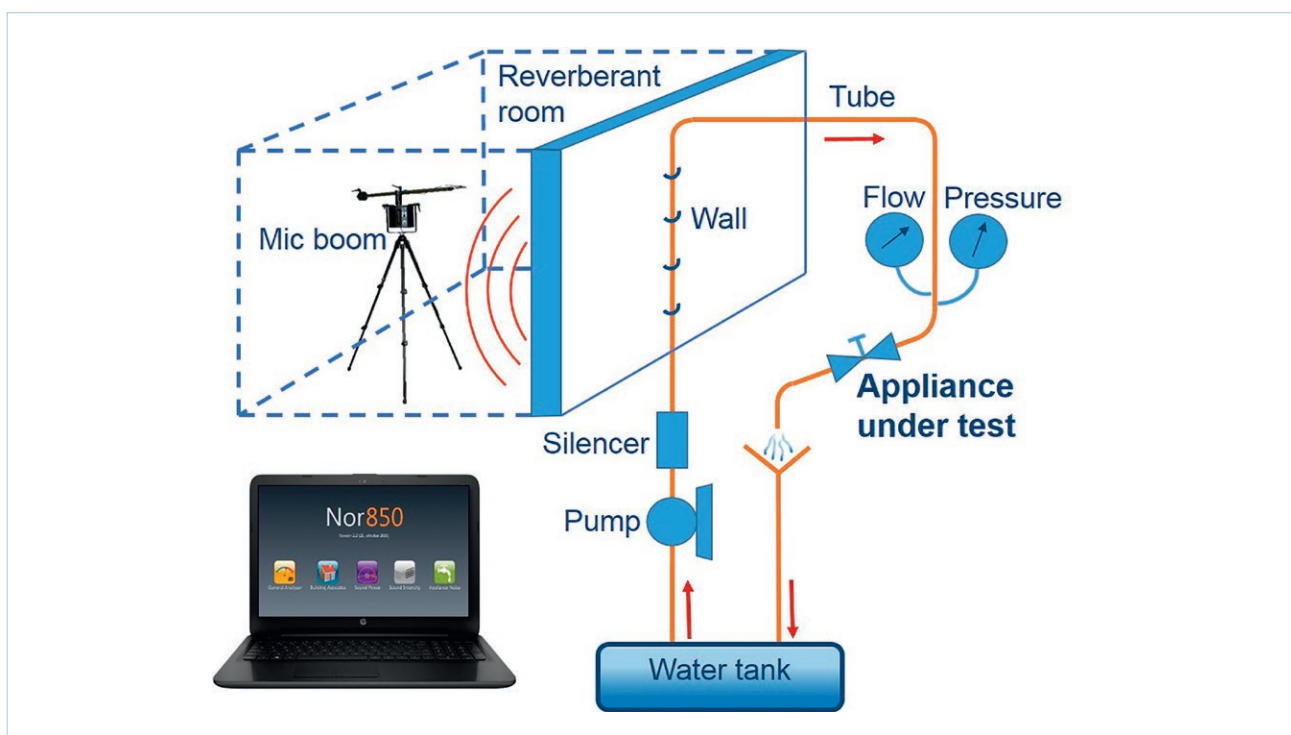
Dodecahedron Loudspeaker Nor283

- Dodecahedron loudspeaker.
- High power loudspeaker with omnidirectional characteristics.
- Conforms to ISO 10140-5 Annex D for laboratory airborne sound insulation
- Conforms to ISO 16283-1 Annex A for in-situ airborne sound insulation
- Conforms to ISO 3382-1 Annex A: 3 - 1 for room acoustic parameters (reverberation time)
- Using the Nor282 power amplifier with pink noise, and equalization: 123 dB (Lin)
- Using the Nor280 power amplifier with pink noise, and equalization: 120 dB (Lin)
- Supplied with individual omni directional calibration certificate.
- Dimensions: 270 mm (10.63").
- Weight: 5.3 kg (11.7 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 loudspeakers Nor275 or Nor276.
- Wireless remote control of noise generator (optional).
- Equalization network to optimize acoustic output from speaker.
- Balanced signal input for low noise and limited cross talk problems.
- Dimension: 275x110x246 mm (10.8x 4.3x9.7")
- Weight: 5 kg (7.9 lb).

Power Amplifier Nor282

- Specially designed for building acoustic and room acoustic measurements.
- Battery operated (90 minutes at full power)
- Graphical user defined equalizer to optimize acoustic output from speaker.
- WiFi for easy connect to Norsonic measuring equipment.
- Compact, 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 loudspeakers types Nor275 or Nor276.
- Wireless Noise on/off hand switch.
- Dimension: 240x 20x256 mm (9.4x4.7x10.1")
- Weight: 5.1 kg (11.5 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 $L_{n,w}$, 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: 265x 230x495 mm (10.4x9.1x19.5").

Impact Ball Nor279

- 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.
- Fulfil the requirements for a "standard heavy impact source" as given in the Japanese JIS A 1418-2:2000 Standard for impact sound insulation.
- Hollow sphere ball.
- Outside diameter 178 mm and thickness 32 mm.
- Silicone rubber material.
- Equivalent mass 2.5 kg (+/- 0.1kg).
- Coefficient of restitution at 0.8 (+/- 0.1).
- Rubber hardness 40o (+/- 5o).

Noise Sources

Microphone Boom Nor265A

- 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 ±90º and ±180º.
- Direct control or remote control from a PC via LAN interface.
- User defined sweeps. Selectable sweep times.
- Supported by Nor850.
- LAN interface.
- Nor265 may be equipped with a turntable (optionally).

Reference Sound Source Nor278

- 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.
- 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.
- Accredited calibrated.
- Long-term stability.
- Weight 18.6 kg
- Rugged.

Acoustic Camera

Applications

- Sound Source Identifications
- Sound Leakage
- Automotive
- Industry
- Environmental Noise
- Building Acoustics

The Norsonic Hextile shaped acoustic camera is a module-based design that gives the user both portability and great resolution for a wide range of measurement situations. The microphone array's hexagon shape gives the ability to combine several tiles into larger arrays.

Hextile – Lightweight and portable
The single Hextile, is a small, lightweight and easy portable acoustic camera suitable for surveys within the frequency range 410Hz to 20K Hz.
A USB cable between the MacBook and the acoustic camera is all you need - no additional power supply is required.

The Hextile is a robust and lightweight aluminium construction, has 128 MEMS microphones, and is less than 3 kg in weight while having a maximum diameter of 46 cm.

Multitile – Great resolution
For users that require a better resolution, particularly at the lower frequencies, three single Hextiles can be combined to a larger Multitile system. With 384 microphones and a maximum diameter of 96 cm, this setup makes you measure frequencies down to 220 Hz from 20K Hz in one shoot.

Multitile (LF mode) – Low frequency measurements
For special low frequency applications, it is also possible to utilise the Multitile in the Low Frequency configuration called Multitile-LF. By placing the individual Hextiles further away from each other, the diameter of the array is increased to 1.46 m. This configuration is ideal for low frequency measurements below 1 kHz, with lowest frequency limit of 120 Hz.

This solution is supplied with a powered USB hub. Using an optical USB cable, the MacBook can be placed more than 10 meters away from the Multitile array.

Nor848 system is quick and easy to set up in the field with its rugged customized tripods.

The Hextile is ready as soon as the USB is plugged and the application is launched.

The Multitile, with its three Hextiles and a bigger tripod, is set-up and ready to measure in less than five 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 MacBook Pro. The list of features is in continuous development.

Ask us for a demonstration, as you need to see it to believe it!

Calibration System Nor1525

The calibration system Nor1525 is capable of calibrating virtually any type of sound measuring instruments, sound calibrators and microphones in accordance with applicable national and international standards.

Applications and features

- Frequency response calibration of microphones using the electrostatic actuator method.
- Sensitivity calibration of microphones using the insert voltage method ensures a high degree of accuracy.
- Fast and accurate calibration of sound calibrators, pistonphones and associated barometers in accordance with IEC 60942 (2003 and 2017).
- Sound level meter calibration in accordance with IEC 61672-3 (2006 and 2013), DIN 45657:2014, ANSI S1.4 (2014).
- Fast and accurate calibration of sound measuring instruments using three different interface modes; manual; semi-automated and fully automated.
- Test of fractional octave filters in accordance with IEC 61260-3:2016.
- Full test report generated.
- Built-in self test features (requires voltmeter).
- Easy to set up, includes all accessories needed.
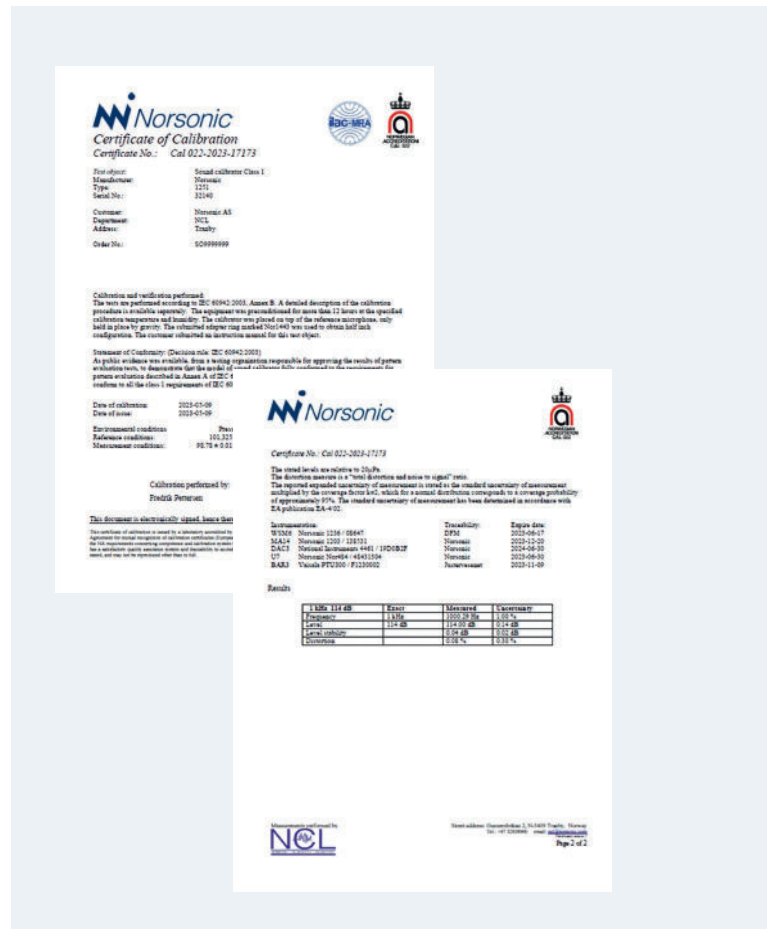
Systems

Airflow Resistance Measurement System Nor1517

Applications

- Quality control in production process.
- Testing in research and development

Features

- The Nor1517A system measures the airflow resistance in porous materials.
- Standards: ISO 9053-2:2020.
- 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-1 to 30 000 Pa s m-1, up to 100 000 Pa s m-1 when correcting for non-linearities.
- Airflow speed: 1.6 mm/s and 5 mm/s (r.m.s.) selected by the stroke 4.46 mm (Cal) or 14 mm (Meas).
- Max. diameter of test pieces: 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 mounting devices for test materials on demand

Norsonic