NTi AUDIO

- Sound Level Meter
- Spectrum Analyzer
- STIPA Analyzer
- Audio Analyzer
- Vibration Meter

XL2

HANDHELD AUDIO AND ACOUSTIC ANALYZER

Made in Switzerland

Measurement Microphone
(class 1 and 2 supported)
Voice Note Microphone
RCA Input
XLR Input
DC Power
USB
Digital I/O
Headphone Output
Speaker on Rear Side
SD Card, removable
SLMeter
LAeq
LCeq
LAF
LAFmax
LCFmax
77.4dB
82.4dB
85.0dB
107.3dB
113.7dB
esc
limit
XL2

INTRODUCTION

The hand-held XL2 Analyzer is a powerful Sound Level Meter, a professional Acoustic Analyzer, a precision Audio Analyzer and a flexible Vibration Meter in one instrument. Easy operation and countless applications distinguish this quality Swiss product.

Switch on - Good to go

Get the job done, on time! The instrument is ready to measure literally seconds after you press the power button. The intuitive navigation and flexible user interface assist in simplifying every task. The XL2 provides an extensive range of measurement functions.

Ready for any Challenge

The XL2 is developed according to user needs, and provides reliable measurement solutions for sound system installations, noise control, architectural acoustics, evacuation systems, live events, quality inspection and occupational health and safety. Discover an instrument you can trust for specialist applications.

APPLICATION AREAS

- Life Safety Systems
- Electroacoustic Installations
- Noise Measurement
- Live Sound
- Industrial and Aerospace
- Room & Building Acoustics
- Quality Control

SOLUTIONS

Installed Sound and Evacuation Systems

XL2's functionalities provide contractors and audio engineers with a comprehensive set of diagnostic and measurements tools. The XL2 Analyzer is perfectly tailored for installing, commissioning and troubleshooting sound and audio systems in cinemas, studios, broadcast and fixed installations. Whether for large commercial spaces, multi-purpose rooms, teleconference rooms, airports or stadiums, the XL2 provides the measurement capability. The optional STIPA measurement quantifies the speech intelligibility of public address and voice evacuation systems.

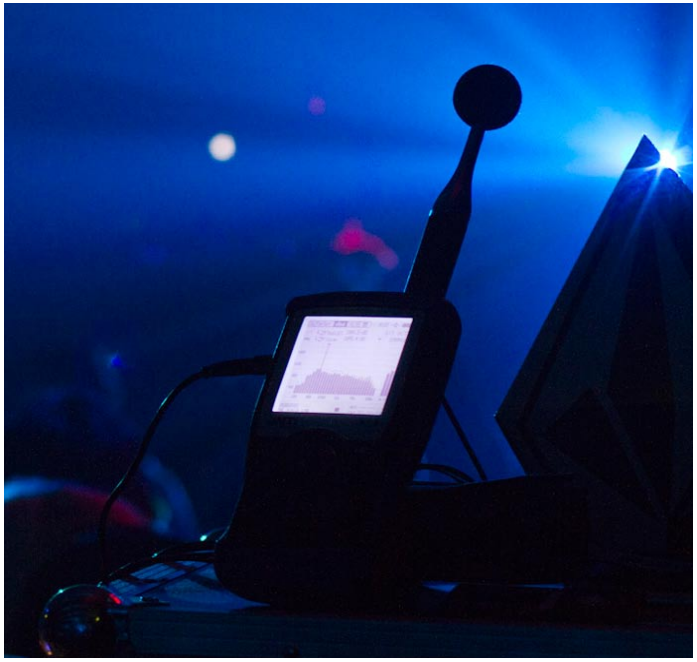
» Use the Measurement Set with XL2 Analyzer, M4261 Microphone, NTi Audio TalkBox and accessories according your application requirements.

Live Sound: Comply with Sound Limits

Set up PA systems and optimize the frequency response with the XL2 Analyzer. The reference memory allows you to match the sound of both the left and right speaker arrays, as well as the monitors. Confirm that all speakers have the same polarity. Analyze the reverberation time to verify the room characteristics. Measure delay line time settings, and improve the total listening experience in the audience area.

The XL2 Analyzer helps you comply with sound limit regulations. Simply power up the XL2 Sound Level Meter, select the pre-configured measurement profile and press start. The tricolor Limit LED gives you the green light when you are within the prescribed limit. Load the logged data into a report template and play the XL2 audio file to review any periods when the sound was over the limit, such as when the audience applause was too loud.

» Use the Measurement Set for Live Sound.



Noise Monitoring

The XL2 Sound Level Meter provides the dedicated solution for industrial, community and occupational noise monitoring. All measurement data is stored on the SD card or, with the Remote Measurement option, directly on a connected computer. Simultaneously the XL2 may record the linear wav-file. The event recorder functionality triggers the measurement by programmable level thresholds or manually by the external input key pad. An additional scheduler function triggers measurements at pre-determined times.

» Use the Measurement Set with XL2 Sound Level Meter, M2230-WP Outdoor Measurement Microphone, Extended Acoustic Pack and Type Approval Option (as required).

Building and Room Acoustics

The XL2 Analyzer provides the handheld solution for airborne and structure borne sound insulation measurements, speech intelligibility and room acoustics. The sound insulation is measured in accordance with ISO 16283, ISO 10140 or ISO 140. XL2 offers detailed evaluation of the acoustic room response with a third-octave RT60 and a high resolution Zoom-FFT.

» Use the Measurement Set with XL2 Sound Level Meter, M2230 Measurement Microphone, Extended Acoustic Pack, Sound Insulation Option or Room Acoustics Option (as required).

PASS/FAIL Tolerance Templates in Quality Control

The XL2 with Spectral Limits Option offers an efficient, low-cost solution for industrial quality control. Measurements can be compared against a reference curve with customized tolerance bands. The pass/fail results are provided by the internal tri-color LED or an optional external Stack Light. Integration tools for automation and remote operation are provided.

» Use the Measurement Set with XL2, M2211 Microphone and Spectral Limits Option.

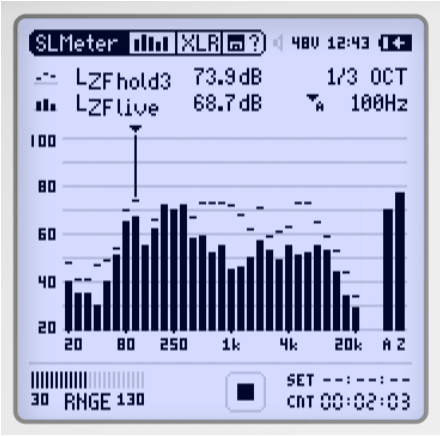
Sound Level Meter

The XL2 provides a precise sound level meter for events and environmental noise monitoring. Numerous measurement variations are simultaneously available. Actual level, Lmin, Lmax, Leq may be measured in combination with frequency weighting A, C or Z and time weightings fast, slow and optional impulse. All results are simultaneously available.

Polarity, Delay, Scope

Further functions measure the polarity of speakers, the delay time for setting up delay lines and view the input signal on an auto-ranging oscilloscope.

Real Time Analyzer

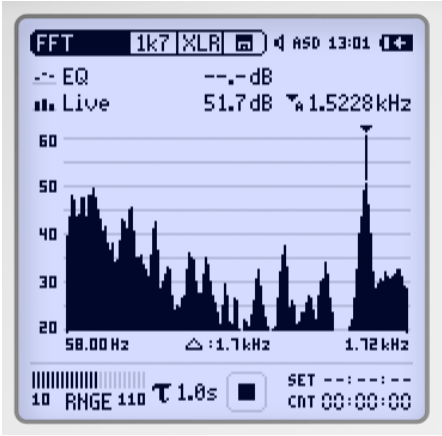


The RTA perfectly suits tasks such as optimization of sound systems and rooms. The XL2 measures and logs wideband values and the real time spectrum in 1/1 or 1/3 octave-band resolution.

Audio Analyzer

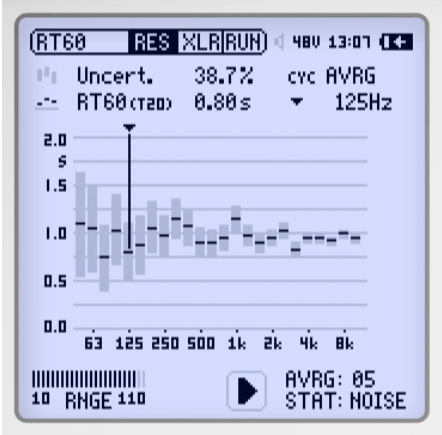
The XL2 with balanced XLR and unbalanced RCA inputs offers a comprehensive, high performance audio analyzer. It simultaneously measures balance, level, distortion (THD+N) and frequency.

FFT Analyzer



The real-time FFT is the ideal tool for visualization of comb filters and narrow band effects. It measures the actual level and the averaged level Leq in three ranges over the entire audio band.

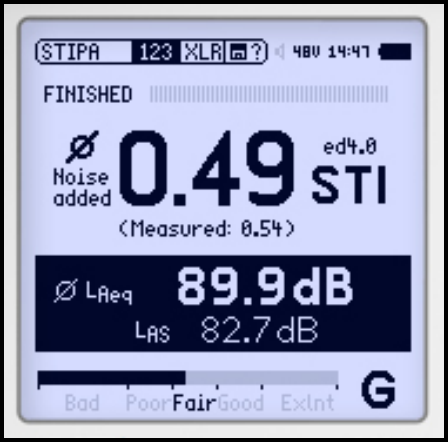
RT60 Reverberation Time



Measure the energy decay with automated triggering using an impulse signal or gated pink noise as signal source, and determine if the room fulfills the RT60 requirements.

FUNCTIONS

Speech Intelligibility STIPA Option



The XL2 Analyzer measures the speech intelligibility according to the latest revision of standard IEC 60268-16. It offers ambient noise correction and automated averaging for repeated measurements. The XL2 displays the speech transmission index (STI) and the common intelligibility scale (CIS), accompanied by the individual levels and modulation indices.

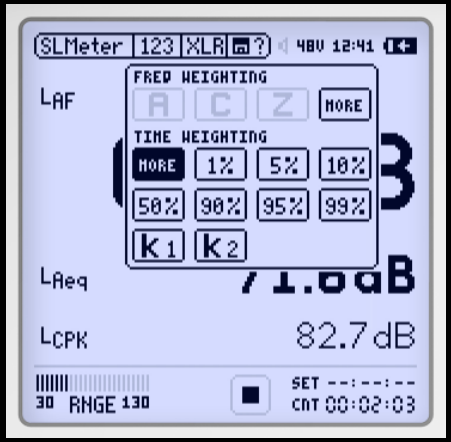
Type Approval Option

Upgrades the instrument to the XL2-TA, which forms a type approved sound level meter in accordance with IEC 61672 and IEC 61260 using the M2230 microphone.

Cinema Meter Option

The Cinema Meter Option forms the dedicated solution for efficient calibration of cinema loudspeaker systems according to SMPTE ST 202:2010 and RP 200:2012. An interactive assistant guides the user through the calibration and verification process.

Extended Acoustic Pack Option



The Extended Acoustic Pack supports the daily tasks of acoustic consultants. It offers additional features for sound level logging and acoustic measurements, such as recording linear wav-files, percentile statistics, sound exposure level, 100 ms logging, event monitoring, RT60 in 1/3 octave resolution, Zoom-FFT with 0.4 Hz resolution and many more.

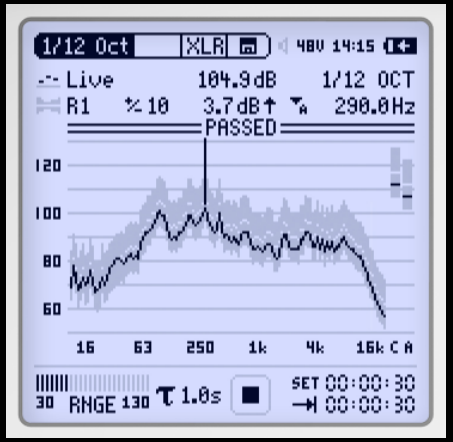
Sound Power Option

Sound Power Reporter is a PC-based software application that provides comprehensive reports in accordance with ISO 3741, 3744, 3746, ANSI-ASA S12.51,...

Vibration Option

The Vibration Option turns the XL2 into a flexible vibration meter, measuring ac¬celeration, velocity and displacement in the range 0.8 Hz - 2.5 kHz. The XL2 uses standard-compliant weighting filters, and provides FFT analysis in selectable ranges from 1 Hz to 1.69 kHz.

Spectral Limits Option



The Spectral Limits Option adds an RTA-Analyzer with 1/6 and 1/12 octave spectral resolution and the Zoom-FFT. It extends the XL2 function range with trace capturing, relative curve display and comprehensive tolerance handling. The XL2 Analyzer compares spectral measurements against reference curves or a tolerance band including PASS/FAIL results.

Remote Measurement Option

The Remote Measurement Option allows you to capture XL2 measurement data in real time into a PC application of your choice, e.g. MS Excel or LabView.

OPTIONS

UNATTENDED NOISE MONITORING

Noise Monitoring Stations

Tailored noise monitoring solutions are available for basic applications and industry professionals. The XL2 Sound Level Meter is connected to the internet through the NetBox using either 3G or LAN communication. The setup is plug-and-play.

Noise Monitoring in "Managed Mode"

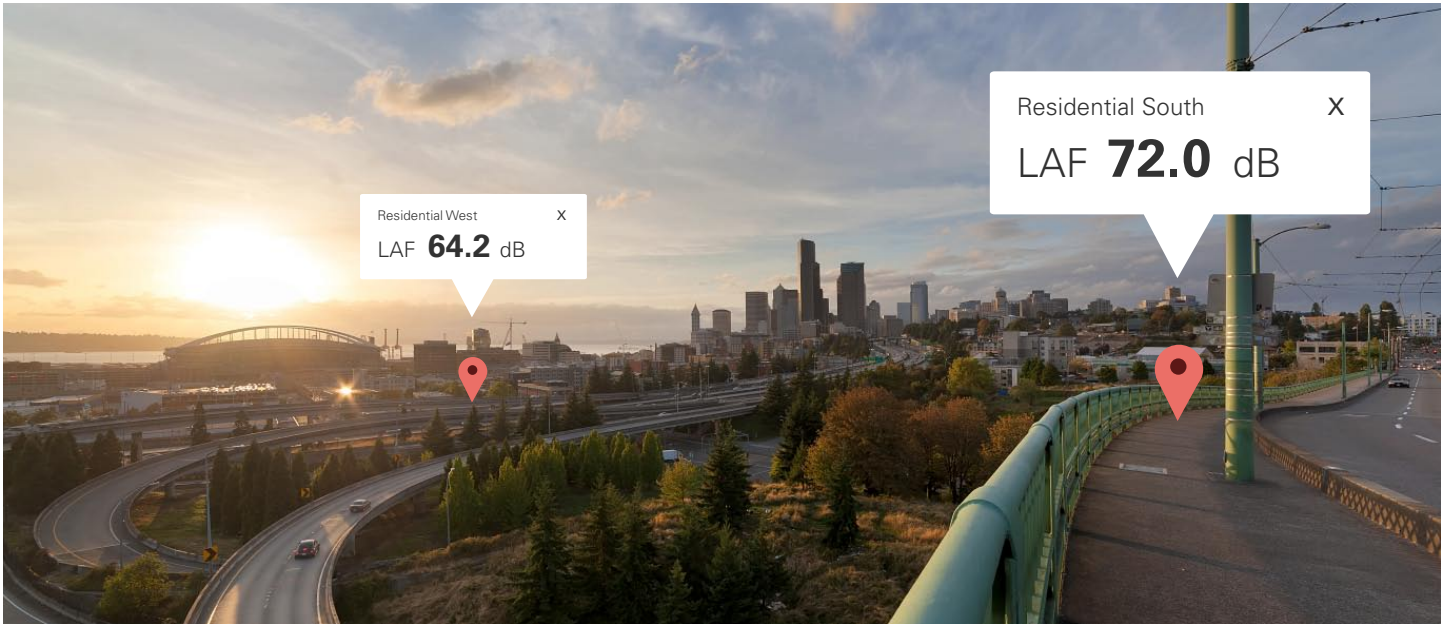
NoiseScout provides a comprehensive but easy-to-use 24/7 noise monitoring solution. Noise levels are recorded on-site by the XL2 Sound Level Meter and are available online for monitoring and download. Automated email alerts allow noise issues to be addressed before a non-compliance condition arises.

Noise Monitoring in "Gateway Mode"

The internet connection allows SFTP (Secure File Transfer Protocol) and remote COM port access to the XL2. From your office, you can control your XL2 as well as access all measurement data on the noise monitoring station out in the field.

The NetBox connects the XL2 to the internet for unattended noise monitoring.

3G LAN



OUTDOOR MEASUREMENT KIT

Unattended Noise Monitoring

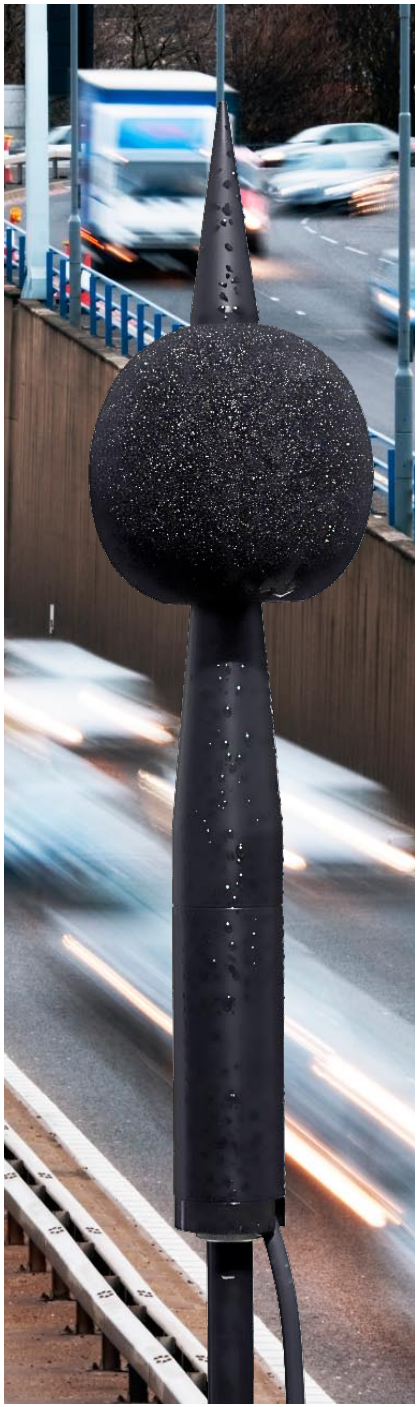
A tailored solution for outdoor noise monitoring is available for the XL2 Sound Level Meter. The outdoor measurement microphone M2230-WP and the heavy-duty outdoor case ideally complement the XL2 system for unattended noise monitoring.

Outdoor Microphone

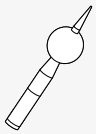
M2230-WP is a weather-protected microphone solution for the XL2 Sound Level Meter allowing acquisition of environmental noise data in outdoor applications. The corrosion-free polymer housing, wind screen and water-repellent membrane protect the microphone capsule. The outdoor microphone M2230-WP fulfills IEC 61672 Class 1 as well as the ANSI S1.4 Type 1 requirements. The upper section of the weather protection kit is snap-on mounted and can thus be easily removed by hand for convenient and quick calibration of the measurement microphone.

Outdoor Case

The outdoor case delivers a professional solution for unattended noise monitoring. It protects the XL2 Sound Level Meter from severe weather conditions and offers generous space for batteries and further accessories. The connection cable to the outdoor microphone runs into the case through a rain-protected aperture.



Accessories



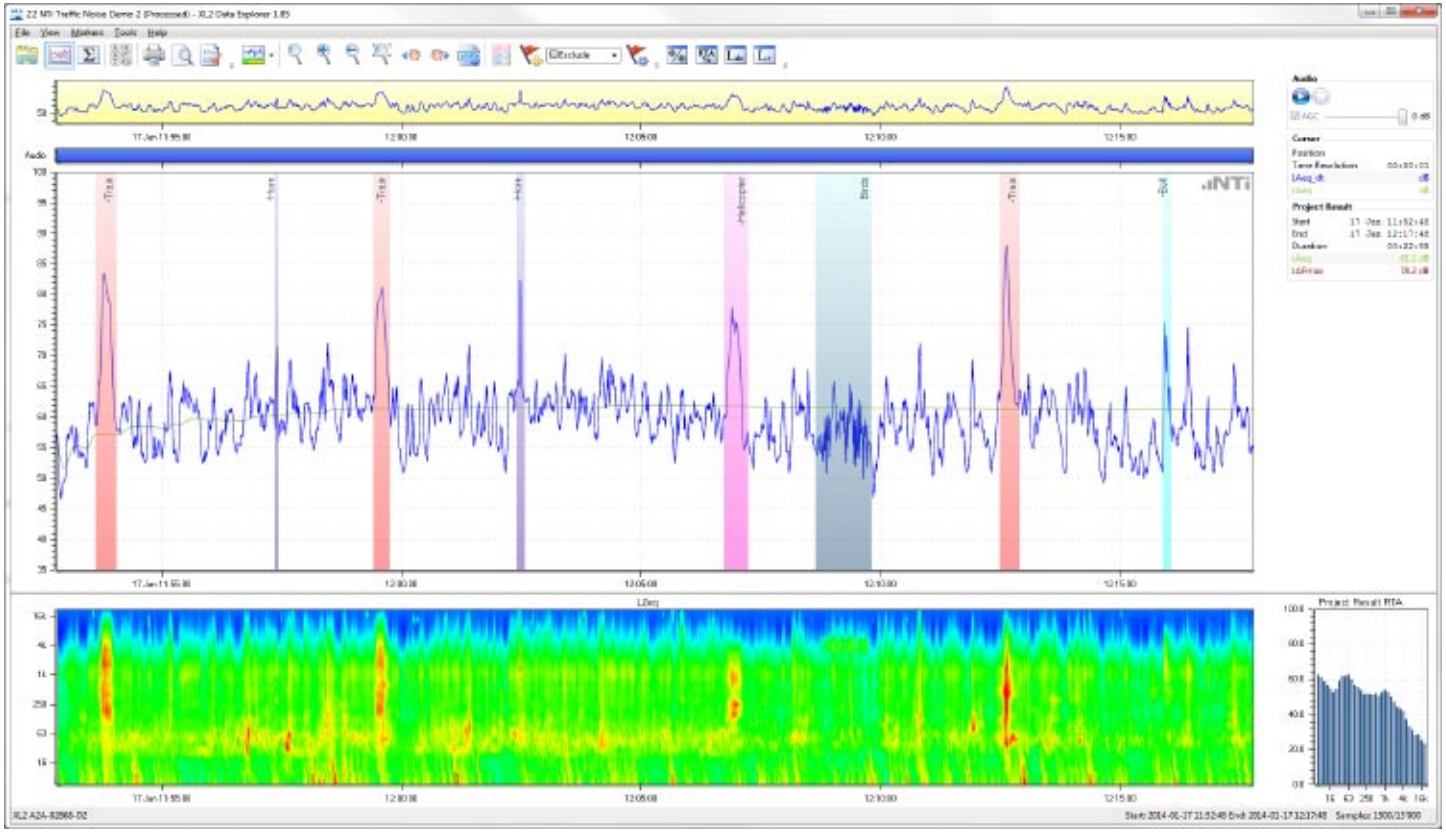
Outdoor Microphone
M2230-WP
600 040 055

Heavy Duty
Outdoor Case
600 000 476

DATA EXPLORER

The easy way to analyze logged sound level data

The Data Explorer is a PC-based software application with a powerful data processor for easy and fast analysis of sound level measurement data. Visualize, analyze and control millions of data points with this tool that is dedicated to acoustic consultants and noise measurement professionals. It provides a convenient way to manage your data and quickly create customized reports. Audio recordings are synchronized to the measurement data on the timeline.



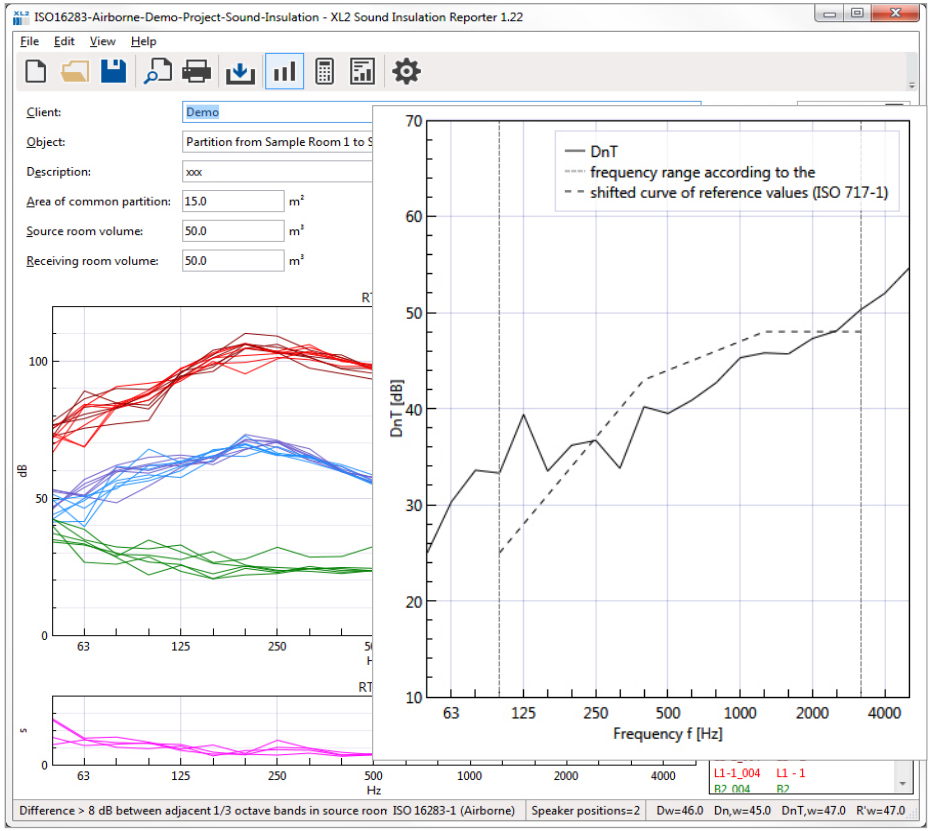
Data Explorer Software

BUILDING AND ROOM ACOUSTICS

Dodecahedron Speaker Set & Sound Insulation Reporter

The Dodecahedron Speaker Set provides a powerful signal source for room and building acoustic measurements. The optimized frequency spectrum delivers a high level of equalized sound energy in accordance with the ISO 16283 and ISO 3382 standards. Designed for acoustic consultants, comprehensive reporting softwares use data gathered by the XL2 Sound Level Meter for detailed analysis and documentation.

» Sound Insulation Reporter is a PC-based software application that provides all the standard reports for airborne and impact sound insulation measurements.
» Room Acoustics Reporter is a PC software for automatically generating reverberation time measurement reports and analyzing the frequency response spectrum.



Sound Insulation Reporter Software

Dodecahedron Speaker DS3
and Power Amplifier PA3

MEASUREMENT MICROPHONES

The microphones are 48 V phantom powered and include an electronic data sheet. The Automated Sensor Detection (ASD) of the XL2 Analyzer automatically reads this data, i.e. the microphone model and calibration data. This promotes faster setup and ensures accurate measurements.

Recommended microphones for the following applications:

Type	Description
M2230	For certified measurements with class 1 requirements according to IEC 61672, metal diaphragm
M2230-Outdoor	Class 1 outdoor measurement microphone (consists of M2230 and WP30 weather protection kit)
M2211	General purpose microphone, with class 1 frequency response and metal diaphragm
M2215	For high acoustic levels (up to 153 dB), with class 1 frequency response and metal diaphragm
M4261	Cost-effective class 2 microphone for general sound level testing, commissioning and service of audio-acoustic installations

	M2230 Class 1 Certified	**M2211 Frequency Response Class 1**	**M2215 High SPL, Freq. Res. Class 1**	**M4261 Class 2**
Microphone Type	Omni-directional, pre-polarized condenser, free field microphone			
Capsule / Transducer	1/2" detachable with 60UNS2 thread			1/4" fixed
PreAmplifier	MA220			-
Flatness acc. IEC61672-1	Class 1			Class 2
Frequency Range	5 Hz - 20 kHz			
Residual Noise Floor typical	16 dB(A)	21 dB(A)	25 dB(A)	27 dB(A)
Linear Range with XL2	24 - 137 dB(A)	29 - 144 dB(A)	33 -153 dB(A)	33 - 146 dB(A)
Maximum SPL THD 3%, 1kHz	137 dBSPL	144 dBSPL	153 dBSPL	142 dBSPL
Sensitivity typ. @ 1kHz	-27.5 $^{\pm 2}$ dBV/Pa (42 mV/Pa)	-34 $^{\pm 3}$ dBV/Pa (20 mV/Pa)	-42 $^{\pm 3}$ dBV/Pa (8 mV/Pa)	-36 $^{\pm 3}$ dBV/Pa (16 mV/Pa)
Temp. Coef. <	-0.01dB/°C	±0.015 dB/°C		±0.02dB /°C
Temp. Range	-10°C to +50°C 14°F to 122°F			0°C - 40°C 32°F -104°F
Pressure Coef.	-0.005dB/kPa	-0.02 dB / kPa		-0.04dB/kPa
Influence of Humidity	< ±0.05 dB (non-condensing)			< ±0.4 dB
Humidity	5% to 90% RH, non-condensing			
Long Term Stability	> 250 years / dB			not defined
Electronic Data Sheet	NTi Audio ASD according to IEEE P1451.4 V1.0 Class 2, Template 27			
Power Supply	48 VDC phantom power, 3 mA typical			
Connector	Balanced 3-pole XLR			
Dimensions	Length 150 mm (5.9"), diameter 20.5 mm (0.8")			
Weight	100 g, 3.53 oz			83g,2.93oz
NTi Audio #	600 040 050	600 040 022	600 040 045	600 040 070

Get full specifications at www.nti-audio.com/mic

ORDERING INFORMATION

Product	NTi Audio #
XL2 + M2230	600 000 355
XL2 + M2211	600 000 351
XL2 + M4261	600 000 341
XL2 Analyzer (no microphone)	600 000 330

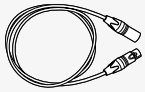
XL2 Options	NTi Audio #
Speech Intelligibility STIPA	600 000 338
Extended Acoustic Pack	600 000 339
Remote Measurement	600 000 375
Spectral Limits	600 000 376
Type Approval	600 000 377
Cinema Meter	600 000 379
Vibration	600 000 436
Projector PRO	600 000 439
Data Explorer	600 000 430
Sound Insulation Reporter	600 000 432
Room Acoustics Reporter	600 000 440
Sound Power Reporter	600 000 434

Accessories

More accessories at www.nti-audio.com/XL2

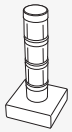
Sound Calibrator
600 000 388

Calibration Certificate
600 000 018



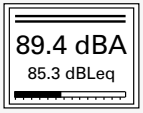
ASD Cable 5, 10, 20m
600 000 336/64/65

Limit Light
600 000 600



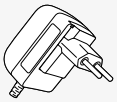
Stack Light
600 000 610

NetBox with Modem
600 000 458

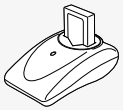


XL2 Projector PRO
(free software)

XL2 Input Keypad
600 000 384



Mains Power Adapter
International # 600 000 333
Americas # 600 000 301



Battery Charger
600 000 332

Exel System Case
600 000 334

Ever-ready Pouch
600 000 335

COMPLETE SOLUTIONS

Measurement Set

The dedicated Measurement Set for your application includes the protective system case with

- XL2 Audio and Acoustic Analyzer
- Measurement Microphone
- Firmware Options and Accessories to suit your solution

ASSOCIATED PRODUCTS

Signal Generator

Analog Audio: Minirator MR-PRO

Digital Audio: Digirator DR2

NTi Audio TalkBox

Calibrated Acoustic Generator

(STIPA Reference & other signals)

FLEXUS FX100

Analog and Digital

Audio Analyzer

TECHNICAL SPECIFICATIONS XL2

Sound Level Meter	
Product Configurations in accordance with IEC 61672 / ANSI S1.4	• XL2 with M2230 microphone » Class 1 certified with Shroud • XL2 with M2211 or M2215 microphone » Frequency response Class 1 • XL2 with M4261 microphone » Class 2
Complying Standards	• IEC 61672, IEC 60651, IEC 61260, IEC 60804, ANSI S1.4, ANSI S1.43, DIN 45657
Sound Level Measurements	• SPL actual, Lmin, Lmax, Lpeak, Leq, gliding Leq • Optional: Percentile statistics, sound exposure level • All measurement results simultaneously available • Correction value measurement wizard • Logging all data or subsets in selectable intervals • Recording of wav-files and voice notes • Limit monitoring showing exceeding sound levels • Digital I/O interface for external peripherals control
Weighting	• Frequency weighting: A, C, Z (simultaneous) • Time weighting: Fast, Slow, Peak, optional: Impulse
Details	• Measurement bandwidth (-3dB): 4.4 Hz to 23.0 kHz • Level resolution: 0.1 dB • Internal noise: 1.3 µV A-Weighted
Real-Time Analyzer RTA	• Wide band • 1/1 octave band: 8 Hz - 16 kHz • 1/3 octave band: 6.3 Hz - 20 kHz • Capturing for comparative measurements
Acoustic Analyzer	
FFT Analysis	• Real-time FFT with actual level, Leq, Lmin, Lmax • Level resolution: 0.1 dB • Optional: Passed/failed measurements
Reverb Time RT60	• 1/1 octave bands results from 63 Hz - 8 kHz (T20,T30) • Optional: 1/3 octave bands results from 50 Hz - 10 kHz
Delay Time	• Propagation delay between electrical reference signal and acoustic signal using the internal microphone
Polarity	• Checks polarity of speakers and line signals
1/12 Octave Analysis (optional)	• Actual level, Leq, Lmin, Lmax • Selectable 1/1, 1/3, 1/6 and 1/12 octave resolution • Passed/failed measurements
STIPA Speech Intelligibility (optional)	• Single value STI and CIS test result in accordance with IEC 60268-16 (1998, 2003, 2011) • Ambient Noise Correction • Automated averaging for repeated measurements • Modulation indices and individual band results

Audio Analyzer	
Level RMS	• True RMS detection in V, dBu, dBV and dBSPL • Range XLR/RCA input: 2 µV - 25 V (-112 dBu to +30 dBu) • Accuracy: ± 0.5 % @ 1 kHz, • Flatness: ± 0.1 dB @ 12 Hz to 21.3 kHz • Bandwidth (-3 dB): 5 Hz to 23.6 kHz
Frequency	• Range: 9 Hz to 21.3 kHz • Accuracy: < ± 0.003%
THD+N	• Range: -100 dB to 0 dB (0.001% to 100%) • Residual THD+N @ XLR/RCA input: < 2 µV
Scope	Auto ranging, auto scaling
Filter	• Frequency weighting: A, C, Z • Highpass 100Hz, 400 Hz, 19 kHz, • Bandpass 22.4 Hz - 22.4 kHz
Input / Output Interfaces	
Audio Inputs	• XLR balanced with input impedance = 200 kOhm, phantom power: +48 V switchable • RCA unbalanced with input impedance > 30 kOhm • Built-in condenser microphone for polarity testing, delay measurements and voice note recording
Audio Outputs	• Built-in speaker • Headphone connector 3.5 mm Minijack Stereo
USB Interface	USB mini connector for data transfer to PC, Remote Measurement, XL2 Projector and charging of battery
Digital I/O	Connection interface to accessories • XL2 Input Keypad • Limit Light, Stack Light • Digital I/O Adapter PCB
Memory	SD Card included (8 GByte), removable, storing measurement data in ASCII format, screen shots, voice notes and wav-files
Power Supply	• Rechargeable Li-Po battery included • Dry cell batteries type AA, 4 x 1.5 V • Linear external power supply 9 VDC • USB-Power Supply
General	
Clock	Real-time clock with lithium backup battery
Temperature	-10 °C to +50 °C (14° to 122°F)
Humidity	5% to 90% RH, non-condensing

Get full specifications at www.nti-audio.com/XL2

info@nti-audio.com
www.nti-audio.com

All information is subject to change without notice.
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