



- Sound Level Meter
- Real Time Analyzer
- Audio Analyzer
- FFT Spectrum Analyzer
- STIPA Analyzer

# XL2

HANDHELD AUDIO AND  
ACOUSTIC ANALYZER



Made in Switzerland 



## INTRODUCTION

The XL2 Analyzer forms the unique combination of a state-of-the-art Sound Level Meter, a comprehensive Acoustic Analyzer as well as a powerful Audio Analyzer. The wide range of functions are tailored for challenging applications in sound installations, evacuation systems, live sound events, noise monitoring, building acoustics, occupational health and manufacturing quality control.

Besides being an advanced, integrating Sound Level Meter, the XL2 measures RTA and FFT high-resolution spectra, RT60 Reverberation Time, Polarity, Delay and THD+N. Optional features are speech intelligibility STIPA, extended acoustics functions, cinema calibration, pass/fail analysis and remote measurement acquisition. The Type Approval Option upgrades the instrument to the XL2-TA, a type approved sound level meter.

Data and audio is logged onto the SD card for transfer to your PC. Free reporting tools are available for download.

## APPLICATION AREAS

- Installed Sound
- Life Safety Systems
- Community Noise
- Live Sound
- Industrial and Aerospace
- 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 Exel Set with XL2, measurement microphone, NTi Audio TalkBox and accessories according your application requirements.

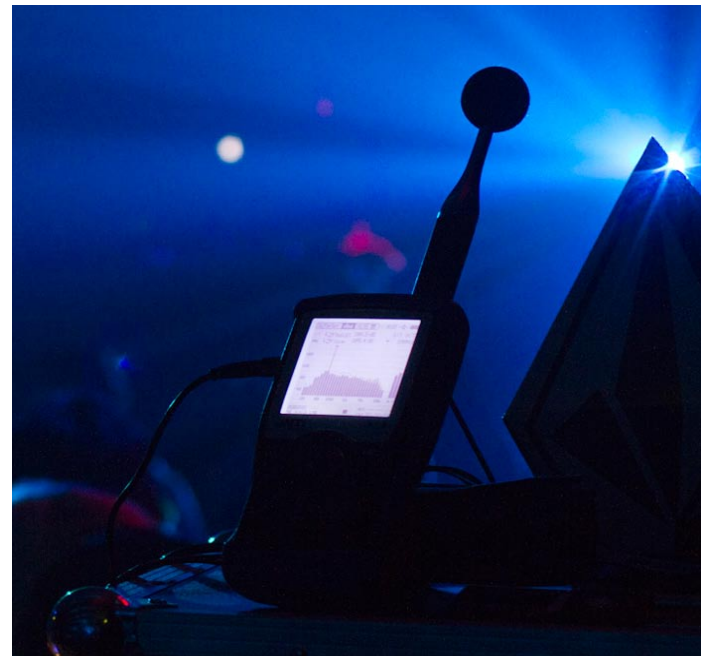


## Live Sound: Comply with Sound Limits

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 Exel 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 Exel Set with XL2 Sound Level Meter, M2230 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. Noise levels and reverberation time are measured in accordance with ISO140. XL2 offers detailed evaluation of the acoustic room response with a high resolution Zoom-FFT and an RTA with 1/1 up to 1/12 octave band spectrums.

- » Use the Exel Set with XL2 Sound Level Meter, M2230 measurement microphone, Extended Acoustic Pack, Spectral Limits Option and Type Approval 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 Exel Set with XL2, M2211 measurement microphone and Spectral Limits Option.

## Sound Level Meter



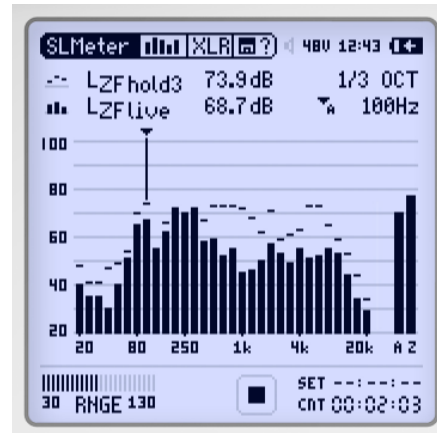
The XL2 provides a precise sound level meter for events and environmental noise monitoring. Numerous measurement variations are simultaneously available. Actual level, Lmin, Lmax, Leq may be measured in combination with frequency weighting A, C or Z and time weightings fast, slow and optional impulse.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

# FUNCTIONS

## Real Time Analyzer



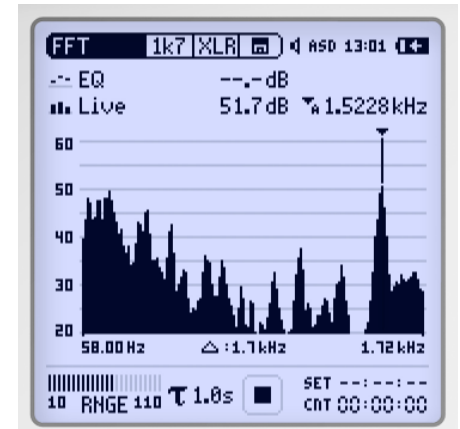
The RTA perfectly suits tasks such as optimization of sound systems and rooms. The XL2 measures and logs wideband values and the real time spectrum in 1/1 or 1/3 octave-band resolution.

## Audio Analyzer



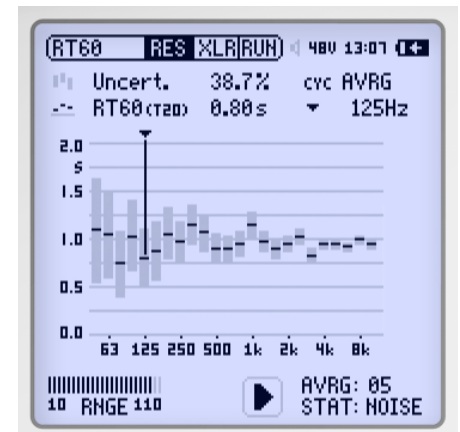
The XL2 with balanced XLR and unbalanced RCA inputs offers a comprehensive, high performance audio analyzer. It simultaneously measures balance, level, distortion (THD+N) and frequency.

## FFT Analyzer



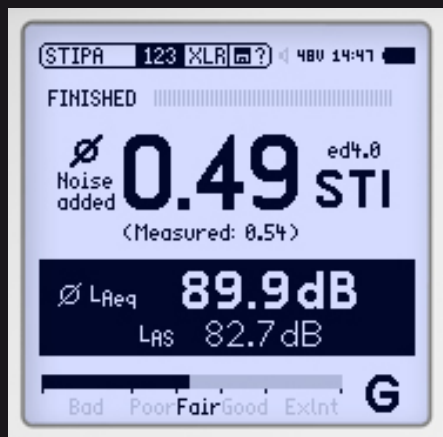
The real-time FFT is the ideal tool for visualization of comb filters and narrow band effects. It measures the actual level and the averaged level Leq in three ranges over the entire audio band.

## RT60 Reverberation Time



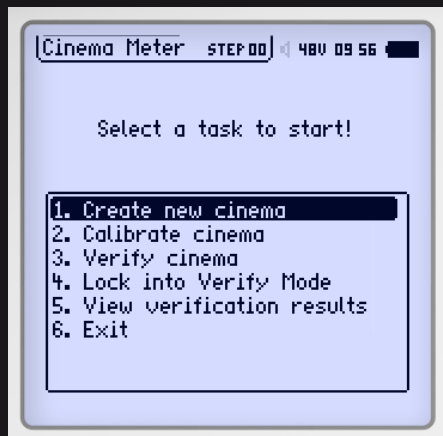
Measure the energy decay with automated triggering using an impulse signal or gated pink noise as signal source, and determine if the room fulfills the RT60 requirements.

## Speech Intelligibility STIPA Option



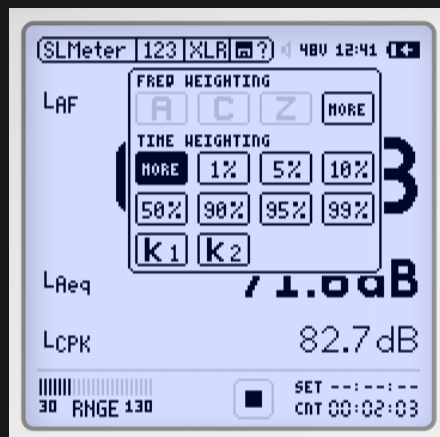
The XL2 Analyzer measures the speech intelligibility according to IEC 60268-16. It offers ambient noise correction and automated averaging for repeated measurements.

## Cinema Meter Option



The Cinema Meter Option forms the dedicated solution for efficient calibration and repetitive verification of cinema loudspeaker systems according to SMPTE ST 202:2010 and RP 200:2012.

## Extended Acoustic Pack Option



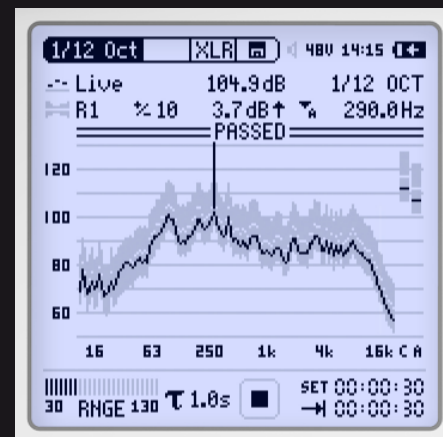
The Extended Acoustic Pack supports the daily tasks of acoustic consultants. It offers additional features for sound level logging and acoustic measurements, such as recording linear wav-files, percentile statistics, sound exposure level, 100 ms logging, event monitoring, RT60 in 1/3 octave resolution,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

## 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.

Link the XL2 to the PC and program your own measurement application for sound level monitoring, audio analysis or automated measurement tasks. The option provides a command set for querying the XL2 measurement data. Application samples are available for download.

## 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.

## Type Approval Option

Upgrades the instrument to the XL2-TA, which forms, with the M2230 microphone, a type approved sound level meter.

OPTIONS

# 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
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
M4260	Cost-effective class 2 microphone for general sound level testing, commissioning and service of audio-acoustic installations

	<b>M2230 Class 1 Certified</b>	<b>M2211 Frequency Response Class 1</b>	<b>M2215 High SPL, Freq. Res. Class 1</b>	<b>M4260 Class 2</b>
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)	29 dB(A)	29 dB(A)
Linear Range with XL2	23.1 - 139 dB(A)	30 - 144 dB(A)	36 - 153 dB(A)	35 - 144 dB(A)
Maximum SPL THD 3%, 1kHz	139 dB SPL	144 dB SPL	153 dB SPL	144 dB SPL
Sensitivity typ. @ 1kHz	-27.5 ±2 dBV/Pa (42 mV/Pa)	-34 ±3 dBV/Pa (20 mV/Pa)	-42 ±3 dBV/Pa (8 mV/Pa)	-31.7 ±4 dBV/Pa (26 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	600 040 025

Get full specifications at [www.nti-audio.com/mic](http://www.nti-audio.com/mic)



# ORDERING INFORMATION

Product	NTi Audio #
XL2 + M2230	600 000 355
XL2 + M2211	600 000 351
XL2 + M4260	600 000 340
XL2 Analyzer (no microphone)	600 000 330

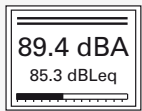
XL2 Options	NTi Audio #
Speech Intelligibility STIPA	600 000 338
Extended Acoustic Pack	600 000 339
Remote Measurement	600 000 375
Spectral Limits	600 000 376
Type Approval	600 000 377
Cinema Meter	600 000 379

Options may be ordered with new instruments or later for user-installation in the field.

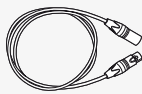


## Accessories

More accessories at [www.nti-audio.com/XL2](http://www.nti-audio.com/XL2)



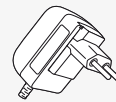
XL2 Projector  
(PC Application  
for free download)



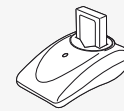
ASD Cable  
# 600 000 336



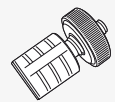
Precision Calibrator  
# 600 000 390



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



Battery Charger  
# 600 000 332



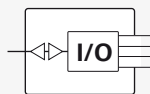
Mounting Adapter  
# 600 000 372  
Americas # 600 000 373



Ever-ready Pouch  
# 600 000 335



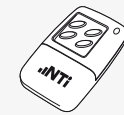
Exel System Case  
# 600 000 334



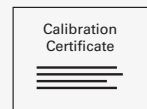
Digital I/O PCB  
# 600 000 380



Stack Light & I/O Box  
# 600 000 381/382



XL2 Input Keypad  
# 600 000 384



Calibration Certificate  
# 600 000 018

## COMPLETE SOLUTIONS

### Exel Set

The dedicated Exel 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	<ul style="list-style-type: none"> <li>• XL2 with M2230 microphone               <ul style="list-style-type: none"> <li>» Class 1 (Type 1) certified with ASD Cable</li> </ul> </li> <li>• XL2 with M2211 or M2215 microphone               <ul style="list-style-type: none"> <li>» Frequency response Class 1 (Type 1)</li> </ul> </li> <li>• XL2 with M4260 microphone               <ul style="list-style-type: none"> <li>» Class 2 (Type 2)</li> </ul> </li> </ul>
Complying Standards	<ul style="list-style-type: none"> <li>• IEC 61672, IEC 60651, IEC 60804, ANSI S1.4, ANSI S1.43, IEC 61260 class 0, ISO 2969</li> </ul>
Sound Level Measurements	<ul style="list-style-type: none"> <li>• SPL actual, Lmin, Lmax, Lpeak, Leq, gliding Leq</li> <li>• Optional: Percentile statistics, sound exposure level</li> <li>• All measurement results simultaneously available</li> <li>• Correction value measurement wizard</li> <li>• Logging all data or subsets in selectable intervals</li> <li>• Recording of wav-files and voice notes</li> <li>• Limit monitoring showing exceeding sound levels</li> <li>• Digital I/O interface for external peripherals control</li> </ul>
Weighting	<ul style="list-style-type: none"> <li>• Frequency weighting: A, C, Z</li> <li>• Time weighting: Fast, Slow, Peak, optional: Impulse</li> </ul>
Details	<ul style="list-style-type: none"> <li>• Measurement bandwidth (-3dB): 4.4 Hz to 23.6 kHz</li> <li>• Level resolution: 0.1 dB</li> <li>• Internal noise: 1.3 <math>\mu</math>V A-Weighted</li> </ul>
Real-Time Analyzer RTA	<ul style="list-style-type: none"> <li>• Wide band</li> <li>• 1/1 octave band: 8 Hz - 16 kHz</li> <li>• 1/3 octave band: 6.3 Hz - 20 kHz</li> <li>• Capturing for comparative measurements</li> </ul>
Acoustic Analyzer	
FFT Analysis	<ul style="list-style-type: none"> <li>• Real-time FFT with actual level, Leq, Lmin, Lmax</li> <li>• Level resolution: 0.1 dB</li> <li>• Optional: Passed/failed measurements</li> </ul>
Reverb Time RT60	<ul style="list-style-type: none"> <li>• 1/1 octave bands results from 63 Hz - 8 kHz (T20)</li> <li>• Optional: 1/3 octave bands results from 50 Hz - 10 kHz</li> </ul>
Delay Time	<ul style="list-style-type: none"> <li>• Propagation delay between electrical reference signal and acoustic signal using the internal microphone</li> </ul>
Polarity	<ul style="list-style-type: none"> <li>• Checks polarity of speakers and line signals</li> </ul>
1/12 Octave Analysis (optional)	<ul style="list-style-type: none"> <li>• Actual level, Leq, Lmin, Lmax</li> <li>• Selectable 1/1, 1/3, 1/6 and 1/12 octave resolution</li> <li>• Passed/failed measurements</li> </ul>
STIPA Speech Intelligibility (optional)	<ul style="list-style-type: none"> <li>• Single value STI and CIS test result in accordance with IEC 60268-16 (1998, 2003, 2011)</li> <li>• Ambient Noise Correction</li> <li>• Automated averaging for repeated measurements</li> <li>• Modulation indices and individual band results</li> </ul>

Audio Analyzer	
Level RMS	<ul style="list-style-type: none"> <li>• True RMS detection in V, dBu, dBV and dB SPL</li> <li>• Range XLR/RCA input: 2 <math>\mu</math>V - 25 V (-112 dBu to +30 dBu)</li> <li>• Accuracy: <math>\pm</math> 0.5 % @ 1 kHz,</li> <li>• Flatness: <math>\pm</math> 0.1 dB @ 12 Hz to 21.3 kHz</li> <li>• Bandwidth (-3 dB): 5 Hz to 23.6 kHz</li> </ul>
Frequency	<ul style="list-style-type: none"> <li>• Range: 9 Hz to 21.3 kHz</li> <li>• Accuracy: <math>&lt;</math> <math>\pm</math> 0.003%</li> </ul>
THD+N	<ul style="list-style-type: none"> <li>• Range: -100 dB to 0 dB (0.001% to 100%)</li> <li>• Residual THD+N @ XLR/RCA input: <math>&lt;</math> 2 <math>\mu</math>V</li> </ul>
Scope	Auto ranging, auto scaling
Filter	<ul style="list-style-type: none"> <li>• Frequency weighting: A, C, Z</li> <li>• Highpass 100Hz, 400 Hz, 19 kHz,</li> <li>• Bandpass 22.4 Hz - 22.4 kHz</li> </ul>
Input / Output Interfaces	
Audio Inputs	<ul style="list-style-type: none"> <li>• XLR balanced with input impedance = 200 kOhm, phantom power: +48 V switchable</li> <li>• RCA unbalanced with input impedance <math>&gt;</math> 30 kOhm</li> <li>• Built-in condenser microphone for polarity testing, delay measurements and voice note recording</li> </ul>
Audio Outputs	<ul style="list-style-type: none"> <li>• Built-in speaker</li> <li>• Headphone connector 3.5 mm Minijack Stereo</li> </ul>
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 <ul style="list-style-type: none"> <li>• XL2 Input Keypad</li> <li>• Digital I/O Adapter Box</li> <li>• Digital I/O Adapter PCB</li> </ul>
Memory	SD Card included (4 GByte), removable, storing measurement data in ASCII format, screen shots, voice notes and wav-files
Power Supply	<ul style="list-style-type: none"> <li>• Rechargeable Li-Po battery included</li> <li>• Dry cell batteries type AA, 4 x 1.5 V</li> <li>• Linear external power supply 9VDC</li> <li>• USB-Power Supply</li> </ul>
General	
Clock	Real-time clock with lithium backup battery
Temperature	-10 $^{\circ}$ C to +50 $^{\circ}$ C (14 $^{\circ}$ to 122 $^{\circ}$ F)
Humidity	5% to 90% RH, non-condensing



[www.nti-audio.com](http://www.nti-audio.com)

All information is subject to change without notice.  
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