XL2
HANDHELD AUDIO AND ACOUSTIC ANALYZER

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

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.

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.

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.

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.

Solutions
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.

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.

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.

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.

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.

The XL2 measures and logs wideband values and the real-time spectrum in 1/1 or 1/3 octave-band resolution.

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.

Sound Level Meter
Real Time Analyzer
FFT Analyzer

Speech Intelligibility STIPA Option
Extended Acoustic Pack Option
Spectral Limits Option

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

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.

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.

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.

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.

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.

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

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.
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.

### MEASUREMENT MICROPHONES

<table>
<thead>
<tr>
<th>Microphone Type</th>
<th>Capsule / Transducer</th>
<th>PreAmplifier</th>
<th>Flatness acc.</th>
<th>Frequency Range</th>
<th>Residual Noise</th>
<th>Dynamic Range</th>
<th>Pressure Coefficient</th>
<th>Incl. Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>M2230 Class 1 Certified</td>
<td>1/2” detachable with 60UN52 thread</td>
<td>-</td>
<td>Class 1</td>
<td>5 Hz - 20 kHz</td>
<td>25 dB(A)</td>
<td>20 - 139 dB(a)</td>
<td>-0.005 dB/Pa</td>
<td>Certified microphone</td>
</tr>
<tr>
<td>M2211 Frequency Response Class 1</td>
<td>1/2” fixed</td>
<td>MA220</td>
<td>Class 1</td>
<td>-</td>
<td>25 dB(A)</td>
<td>20 - 139 dB(a)</td>
<td>-0.005 dB/Pa</td>
<td>microphone kit</td>
</tr>
<tr>
<td>M2215 High SPL Freq. Res. Class 1</td>
<td>-</td>
<td>-</td>
<td>Class 2</td>
<td>-</td>
<td>25 dB(A)</td>
<td>20 - 139 dB(a)</td>
<td>-0.005 dB/Pa</td>
<td>microphone kit</td>
</tr>
<tr>
<td>M4260 Class 2</td>
<td>-</td>
<td>-</td>
<td>Class 2</td>
<td>-</td>
<td>25 dB(A)</td>
<td>20 - 139 dB(a)</td>
<td>-0.005 dB/Pa</td>
<td>Class 2 microphone</td>
</tr>
</tbody>
</table>

**Type**

- **M2230** For certified measurements with class 1 requirements according to IEC 61672, metal diaphragm and certified microphone.
- **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.

**Description**

- **Class 1** Certified
- **Class 1** Frequency Response
- **Class 1** High SPL Frequency Response
- **Class 2** Frequency Response

**Recommended microphones for the following applications:**

- **M2230**
- **M2211**
- **M4260**

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

### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Product</th>
<th>NTI Audio #</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL2 + M2230</td>
<td>600 000 355</td>
</tr>
<tr>
<td>XL2 + M2211</td>
<td>600 000 351</td>
</tr>
<tr>
<td>XL2 + M4260</td>
<td>600 000 340</td>
</tr>
<tr>
<td>XL2 Analyzer (no microphone)</td>
<td>600 000 330</td>
</tr>
</tbody>
</table>

**XL2 Options**

- **Speech Intelligibility STI/PA**
- **Extended Acoustic Pack**
- **Remote Measurement**
- **Spectral Limits**
- **Type Approval**
- **Cinema Meter**
- **Data Explorer**

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

---

**Accessories**

- **XL2 Projector (PC application for free download)**
- **ASD Cable**
- **Precision Calibrator**
- **Mains Power Adapter**
- **Battery Charger**
- **Mounting Adapter**
- **Eveready Pouch**
- **Exil System case**
- **Digital I/O PCB**
- **Stack Light & I/O Box**
- **XL2 Input Keypad**
- **Calibration Certificate**

---

**More accessories at** www.nti-audio.com/XL2
## 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: Digitator D92

- **NTI Audio TalkBox**
  - Calibrated Acoustic Generator (STPA Reference & other signals)

- **FLEXUS FX100**
  - Analog and Digital Audio Analyzer

## TECHNICAL SPECIFICATIONS XL2

### Sound Level Meter

<table>
<thead>
<tr>
<th>Product Conformations in accordance with IEC 61672 / ANSI S1.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL2 with M2230 microphone</td>
</tr>
<tr>
<td>Class 1 (Type 1) certified with ASD Cable</td>
</tr>
<tr>
<td>XL2 with M2211 or M2215 microphone</td>
</tr>
<tr>
<td>Frequency response Class 1 (Type 1)</td>
</tr>
<tr>
<td>XL2 with M2285 microphone</td>
</tr>
<tr>
<td>Class 2 (Type 2)</td>
</tr>
</tbody>
</table>

### Compliance Standards

- SPL: actual, Lmin, Lmax, 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

### Details

- Measurement bandwidth (-3dB): 4.4 Hz to 23.6 kHz
- Level resolution: 0.1 dB
- Internal noise: 1.3 µV A-Weighted

### Real-Time Analyzer RTA

- 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)
  - 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

- **STPA Speech Intelligibility (optional)**
  - Ambient Noise Correction
  - Automated averaging for repeated measurements
  - Modulation indices and individual band results

### Measurement Microphone

- Range: 9 Hz to 21.3 kHz
- Frequency response: ± 0.5 % @ 1 kHz
- Phantom power: +48 V switchable

### Interface

- XLR balanced with input impedance > 30 kohm
- RCA unbalanced with input impedance > 30 kOhm
- Built-in condenser microphone for polarity testing, delay measurements and voice note recording

### Digital I/O

- Connection interface to accessories
- XL2 Input Keypad
- Digital I/O Adapter Box
- Digital I/O Adapter PCB

### Memory

- SD Card included (4 GByte), removable, storing measurement data in ASCII format, screen shots, voice notes and wav-files

### Power Supply

- Rechargeable LiPo 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°F to 122°F)
- Humidity: 5% to 90% RH, non-condensing

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