

NEW!

Sound Level Meter

Real Time Analyzer

FFT Analyzer

STI-PA Analyzer

Audio Analyzer

XL2

**HANDHELD AUDIO AND
ACOUSTIC ANALYZER**



EXELINE

Made in Switzerland

INTRODUCTION

The XL2 analyzer forms the unique combination of a state-of-the-art Sound Level Meter, a comprehensive Acoustical Analyzer as well as a powerful Audio Analyzer. The wide range of functionalities are tailored for challenging applications in Installations, Live Sound, Studio, Broadcast and Environmental Noise measurements.

The measurement microphones M4260 (Class 2) or M2210 (Class 1 frequency response) are available for acoustical measurements. The XL2 generates the 48V phantom power supply for the microphones and reads the included electronic data sheet of the M4260 and M2210 automatically. This promotes faster setup and ensures accurate measurements. Additionally the XL2 logs the calibration data and microphone serial number at each measurement.

The eight fast access buttons together with the rotary wheel enable an intuitive instrument operation for precise measurements. The recorded measurement data can be transferred to PC either by the USB interface or directly from the Mini-SD card for later documentation.

FLEXIBLE USER INTERFACE

A remarkable advantage of the XL2 is the flexible user interface. The measurement screens may be personalized and only a limited subset of the comprehensive functionalities enabled for simplified operator interfaces. Advanced users may access all menus, settings and store their preferred measurement configurations. For basic users offers the XL2 Audio and Acoustic Analyzer fixed operator interfaces with specific pre-defined settings. The XL2 boots up with exactly the required measurement parameters according the pre-defined instrument configurations. This ensures accurate measurements achieved by advanced and basic users.



FUNCTIONS

Sound Level Meter and Real Time Analyzer

The XL2 provides together with the measurement microphones a precise sound level meter for monitoring of live sound events and environmental noise. For example Actual, L_{min} , L_{max} , L_{eq} , L_{Cpeak} are measured with frequency weighting A, C, Z and time weightings F, S at the same time. All measurement results are simultaneously available. Customers may log all acquired level information onto a removable Mini-SD card including real time information. The measured signal can be monitored acoustically at the internal speaker, e.g. at applications with the microphone positioned in another room.

The accuracy of the XL2 exceeds IEC 61672-1, class 1. The XL2 measures correction values between the loudest point of the live event and actual measurement positions according DIN 15905-5 and SLV 2007.

In addition to the wide band parameters the XL2 measures in parallel the real time spectrum either in 1/1 or 1/3 octave-band resolution. The RTA perfectly suits tasks, such as optimizing of sound systems.

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.

Extended Acoustic Pack (optional)

The Extended Acoustic Pack offers additional features for sound level- and acoustical measurements. These are statistical distribution as Percentiles, TaktMax, Sound exposure level, impulse time weighting, high resolution FFT and wave file recordings for a complete documentation of the measured sound pressure levels. Additional voice notes might be added for each measurement.

RT60 Reverberation Time

The XL2 measures the energy decay in from 63 Hz to 8 kHz by the Schroeder method. As test signal serves either an impulse source or gated pink noise.

Delay Time

The delay function suits the accurate setup of delay line arrangements, thus the directionality of the signal source will be optimized. The XL2 measures the delay time between the electrical reference signal and the acoustical signal from the speaker. The required acoustical delay settings are displayed automatically, thus the audio engineer may set the measured delay time directly at the delay device in the rack.

Audio Analyzer

Together with the balanced XLR and unbalanced RCA inputs includes the XL2 a comprehensive audio analyzer. It measures simultaneously level, distortion (THD+N) and frequency. The internal loudspeaker or headphone output offers audible monitoring of the test signal or just listening to the residual distortion. The optimized low distortion and low noise design enable level measurements down to -112 dBu and residual distortions typically lower than -100 dB, which is unmatched in handheld instruments.

Speech Intelligibility STI-PA (optional)

The STI-PA function measures the speech intelligibility of public announcement systems according the latest revision of IEC 60268-16:2003 standard. The XL2 displays the measurement results as STI or as CIS results, accompanied by the individual levels and modulation indices of the seven octave bands. The measurement results are acquired from the NTi Audio STI-PA test signal, generated by the included STI-PA Test CD, Minirator MR-PRO or the NTi Audio TalkBox.

LIVE SOUND SOLUTIONS

SPL / LEQ

RTA

LOGGING

WAV REC

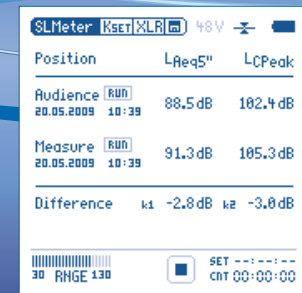
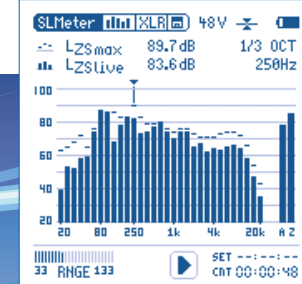
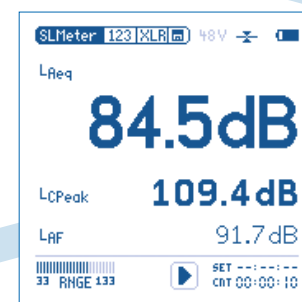
DELAY

POLARITY

The XL2 Audio and Acoustic Analyzer offers all tools to optimize the performance of live sound systems within one instrument. It complies with the most recent international standards for environmental noise monitoring. The acoustic analyzer XL2 fulfills class 1 requirements throughout the hardware and algorithms.

The broad list of functions compels:

- Sound level meter displays up to five levels simultaneously
- Visual limit indication at exceeding sound levels
- Real time analyzer in 1/3 octave or 1/1 octave resolution
- Logging of all measurements to the internal Mini-SD Card
- Simplified operation using application profiles
- Correction factor measurement wizard for DIN 15905-5
- Built-in real time clock
- WAV-file recording to Mini-SD Card*



INSTALLED SOUND & STUDIO / BROADCAST SOLUTIONS

XL2's broad range of functionalities provides contractors and audio engineers a comprehensive set of diagnostic and measurements tools. The instruments is perfectly tailored for installing, commissioning and troubleshooting sound- and audio systems in studios, broadcast and fixed installations.

The feature list includes:

- Analyzer for acoustic and electrical audio measurements
- Balanced signal input from -112 dBu (2 μ V) up to 30 dBu (25 V) with residual distortions of typically < -100 dB (0.001%)
- High-resolution FFT for narrowband analysis, 10 Hz to 20 kHz
- Reverberation time with impulse source or gated pink noise
- Delay and polarity measurements
- Built-in loudspeaker with automatic gain control
- Speech intelligibility STI-PA acc. to IEC 60268-16 (optional)

SPL / LEQ

RTA

FFT

RT-60

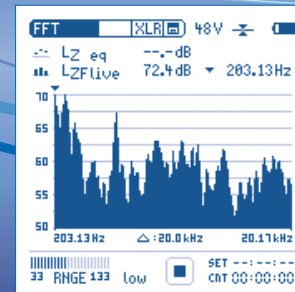
DELAY

POLARITY

LEVEL

THD

STI-PA



MEASUREMENT MICROPHONES

The plug-on measurement microphones M4260 (class 2) and M2210 (class 1 frequency response) form with the XL2 a comprehensive sound level meter and acoustic analyzer. The microphones include an electronic data sheet. Thus the automated sensor detection of the XL2 recognizes the sensitivity and calibration data of the connected microphone.

M4260 Measurement Microphone



M2210 - Enhanced Performance Measurement Microphone

	M4260	M2210 - Enhanced Performance
Microphone Type	Omni-directional, pre-polarized condenser, free field microphone	
Capsule / Transducer	1/4" permanently installed capsule	1/2" detachable capsule with 60UNSZ thread
Flatness	Class 2 (IEC61672-1) < ±1 dB @ 100 Hz - 1250 Hz < ±3 dB @ 20 Hz - 20 kHz	Class 1 (IEC61672-1) < ±1 dB @ 100 Hz - 4 kHz < ±2 dB @ 10 Hz - 20 kHz
Frequency Range	20 Hz - 20 kHz	1 Hz - 20 kHz
Residual Noise Floor typ.	27 dB(A)	18 dB(A)
Upper Limit of Dynamic Range typical	136 dB	145 dB
Sensitivity typical	-30 dBV/Pa ±4 dB (30 mV/Pa @ 1kHz)	-34 dBV/Pa ±3 dB (20 mV/Pa @ 1kHz)
Temperature coefficient	0.05 dB / °C @ +10 to +50°C	0.01 dB / °C @ -10 to +50°C
Electronic Data Sheet	NTi Audio ASD according to IEEE P1451.4 V1.0, Class 2, Template 27	
Output Impedance	100 Ohm balanced	
Power Supply	48 VDC phantom power, 3 mA typical	
Dimensions	Length 150 mm (5.9"), diameter 20.5 mm (0.8")	
Connector	Balanced 3-pole XLR	

ACCESSORIES

Battery Charger
with Spare Battery



Exel System Case
Delivery without Content



Ever-ready Pouch



Mains Power Adapter



ORDER INFORMATIONEN

Product	NTi Audio #
Set XL2 + M4260	600 000 340
Set XL2 + M2210 - Enhanced Performance	600 000 350
XL2 without Measurement Microphone	600 000 330
M4260 Measurement Microphone, Class 2	600 040 025
M2210 Measurement Microphone, Class 1 Frequency Response	600 040 020
Calibration Certificate for one new device	600 000 018

ASD Cable (special audio cable for the transmission of the electronic data sheet from measurement microphone to the XL2, length = 5 metre)	600 000 336
Battery Charger with Spare Battery	600 000 332
Spare Battery	600 000 337
Mains Power Adapter	600 000 333
Ever-ready Pouch	600 000 335
Exel System Case	600 000 334
XL2 STI-PA Option	600 000 338
Extended Acoustic Pack	600 000 339

TECHNICAL SPECIFICATIONS XL2

Sound Level Meter	
Product Configurations	<ul style="list-style-type: none"> • XL2 with M2210 microphone: Class 1 freq. response acc. to IEC 61672 • XL2 with M4260 microphone: Class 2 acc. to IEC 61672
Conforms with Standards	IEC 61672, IEC 60651, IEC 60804, DIN 15905-5, DIN 45657-1, SLV 2007, ANSI S1.4, ANSI S1.43
Measurements	<ul style="list-style-type: none"> • SPL actual, L_{eq}, L_{min}, L_{max}, L_{Cpeak} • Gliding L_{Aeq} with $t = 5'$, $60''$ and $60'$ • All measurement results are simultaneously available • Level Resolution: 0.1 dB • Logging all data or subsets in selectable intervals
Functions Extended Acoustic Pack (optional)	<ul style="list-style-type: none"> • Percentiles: 1%, 5%, 10%, 50%, 90%, 95%, 99% • Time Weighting: Impulse • Sound Pressure Level L_{Leq}, Sound Exposure Level L_{AE} • TaktMax and values as specified in DIN 45645-1 • WAV-file recording (ADPCM) • Voice note recording for individual measurements • High-resolution FFT up to 0.3 Hz steps in 10 Hz - 20 kHz
Weighting	<ul style="list-style-type: none"> • Frequency Weighting: A, C, Z • Time Weighting: Fast, Slow, Impulse*
Linear Measurement Range	<ul style="list-style-type: none"> • Overall linear measurement range 3 μV - 25 V_{RMS} parted in 3 overlapping ranges based on the preset sensitivity, e.g. Sensitivity = 50 mV/Pa -> overall measurement range = 0 - 140 dB • Sensitivity = 20 mV/Pa -> overall measurement range = 10 - 150 dB • Internal noise: 1.3 μV A-Weighted
Real Time Analyzer RTA	<ul style="list-style-type: none"> • Frequency Resolution: 1/3 octave, 1/1 octave, wide band • Frequency Range: 6.3 Hz to 20 kHz • Level Resolution: 0.1 dB • Band pass filters conform IEC 61260 class 0, ANSI S1.11-2004, class 1
Acoustic Analyzer	
FFT Analysis	<ul style="list-style-type: none"> • Real time FFT with LZf and L_{eq} with level resolution 0.1 dB • Ranges: 10 Hz - 220 Hz, 20 Hz - 1.7 kHz, 200 Hz - 20 kHz • High-resolution FFT up to 0.3 Hz steps in 10 Hz - 20 kHz
Reverberation Time RT60	<ul style="list-style-type: none"> • 1/1 octave bands results from 63 Hz - 8 kHz, based on T20 • 1/3 octave bands results by post processing • Range: 10 ms - 14 seconds • Measurement according to ISO3382 by Schroeder-method • Test signal: Impulse source or gated pink noise generated by the MR-PRO, MR2 or the included NTi Audio Test CD
Delay Time	<ul style="list-style-type: none"> • Propagation delay between electrical reference signal and acoustical signal using the internal microphone • Resolution: 0.1 ms • Range: 0 ms - 1 second (0 m - 344 m) • Test signal: NTi Audio delay test signal generated by the MR-PRO, MR2 or the included NTi Audio Test CD
Polarity	<ul style="list-style-type: none"> • Checks polarity of speakers and line signals • Positive/Negative detection of wideband and individual 1/1 octave bands through internal microphone or XLR/RCA connector • Test signal: NTi Audio polarity test signal generated by the MR-PRO, MR2 or the included NTi Audio Test CD
STI-PA Speech Intelligibility (optional)	<ul style="list-style-type: none"> • Single value STI and CIS test result according to IEC 60268-16, 2003 release, DIN VDE 0833-4, IEC 60849, DIN VDE 0828-1 • Modulation indices and individual band level results with error indicator, post processing with recorded spectra supported • Test signal: NTi Audio STI-PA signal generated by the MR-PRO, NTi Audio TalkBox or the STI-PA Test CD

Audio Analyzer	
Level RMS	<ul style="list-style-type: none"> • True RMS detection in V, dBU and dBV • Range XLR/RCA input: 2 μV - 25 V (-112 dBU to +30 dBU) • Accuracy: $\pm 0.5\%$ @ 1 kHz • Flatness: ± 0.1 dB • Bandwidth: 20 Hz to 20 kHz • Resolution: 3 digits (dB scale) or 4 digits (linear scale)
Frequency	<ul style="list-style-type: none"> • Range: 9 Hz to 20 kHz • Resolution: 6 digits • Accuracy: $< \pm 0.003\%$
THD+N (Total Harmonic Distortion + Noise)	<ul style="list-style-type: none"> • Range: -100 dB to 0 dB (0.001% to 100%) • Minimum level: > -90 dBU • Bandwidth: 10 Hz to 20 kHz • Resolution: 3 digits (dB scale) or 4 digits (linear scale) • Residual THD+N @ XLR/RCA input: < 2 μV
Filter	<ul style="list-style-type: none"> • Frequency weighting: A, C, Z, Highpass 400 Hz, Highpass 19 kHz
Input / Output Interfaces	
Audio Inputs	<ul style="list-style-type: none"> • XLR balanced with input impedance = 200 kOhm, phantom power: +48 V switchable, automated sensor detection for M4260/M2210 • RCA unbalanced with input impedance >30 kOhm • Built-in condenser microphone for polarity testing, delay measurements and voice note recording*
Audio Outputs	<ul style="list-style-type: none"> • Built-in speaker • Headphone connector 3.5 mm Minijack Stereo
USB Interface	USB mini connector for data transfer to PC and charging of Li-Po battery
Digital I/O	Serial 1 Bit I/O interface, programmable (prepared for later firmware extension)
TOSLink	24 bit linear PCM audio signal output (prepared for later firmware extension)
Memory	Mini-SD card, 2 GByte, removable, storing ASCII data, screen shots, voice notes* and WAV-files*
Power Supply	<ul style="list-style-type: none"> • Rechargeable Li-Po battery included, type 3.7 V / 2640 mAh, typical battery lifetime > 5 hours • Dry cell batteries type AA, 4 x 1.5 V, typical battery lifetime > 4 hours • Linear external power supply 9 VDC (charges Li-Po battery in operation)
General	
Clock	Real time clock with lithium backup battery
Calibration	<ul style="list-style-type: none"> • Recommended calibration interval: one year • Microphone calibration supported with external calibrator • Calibration certificate for new instruments optional available
Mechanics	<ul style="list-style-type: none"> • Tripod mount and wire stand mounted on rear side • Display: 160 x 160 pixels grey scale with LED back light • Dimensions: 180 mm x 90 mm x 45 mm (7.1" x 3.5" x 1.8") • Weight: 480 g (1 lbs) including built-in Li-Po battery
Temperature	Operation: +5 °C to +45 °C (41° - 113°F) Storage: -10 °C to +60 °C (14° - 140°F)
Humidity	5% to 90% RH, non condensing
Electromagnetic Compatibility	CE compliant: EN 61326-1 Class B, EN 55011 class B, EN 61000-4-2 to -6 & -11

* optional

