

EXEL Line for Live Sound



Exel Line: Minirator MR-PRO with
XL2 Audio and Acoustic Analyzer

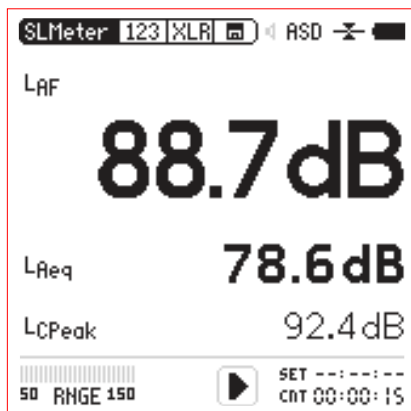


Applications

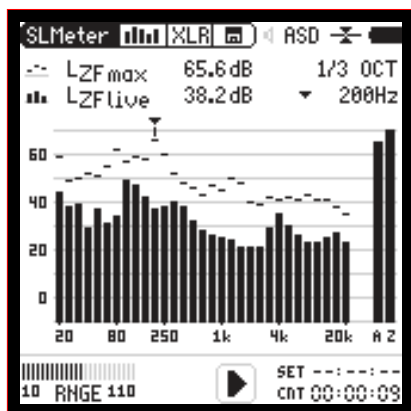
- Tune and optimize PA-systems
- Fast troubleshooting of audio- and acoustic devices
- Sound level monitoring and documentation in event areas according to DIN 15905-5, DIN 45645, SLV 2007, SLV 2010-FL
- Noise pollution monitoring in the neighborhood

Advantages

- Handheld and compact design for field applications
- Simple operation with predefined measurement profiles for automated sound level documentation and audio wav-file recording of the entire event to SD Card
- Visual indication of exceeding sound levels on the XL2, the connected notebook or the SPL Stack Light
- Calibrated audio and acoustic test system for traceable measurements



XL2 Screenshot Sound Level Meter



XL2 Screenshot Real Time Analyzer

XL2 Analyzer Functions

- Sound pressure level SPL
The XL2 monitors sound levels for protecting the attending audience against excessive noise and preventing annoying noise pollution in the neighborhood. The correction value wizard measures the difference between the loudest venue position and the actual measurement position. All sound level data are stored with real time information, wav-files and voice notes on the SD Card for each measurement.
- Real time analyzer RTA
The RTA supports fine tuning the sound performance with pink noise and improves feedback stability of PA systems and monitor speakers. The reference spectra of speakers may be captured for comparative measurements, thus achieving the same sound performance of all speakers.
- Polarity
The left and right speakers shall be verified for the same polarity, thus achieving a broad stereo sound image. The individual polarity of woofers, mid-range speakers and tweeters are shown at one glance.
- Line level RMS and THD+N
Verifies and troubleshoots the audio system performance.
- Delay
Setup of delay line speakers in larger auditoriums, such as churches and conference systems.

Minirator MR-PRO Functions

- Test signal generator
Provides sound sequences for your personalized sound check, test signals for troubleshooting, like pink noise, and measures the audio balance and microphone phantom power.
- Cable tester
Verifies XLR audio cables for defects including pin 1 test.



Exel Acoustic Set

Order Information

	NTi Audio #
Exel Acoustic Set Class 2, with M4260 Measurement Microphone	600 000 400
Exel Acoustic Set Class 1 frequency response with M2210 Measurement Microphone	600 000 410

For more information please visit www.nti-audio.com/exel.

EXEL Line for Installed Sound



Exel Line: Minirator MR-PRO with
XL2 Audio and Acoustic Analyzer



Applications

- Commissioning and verification of electro-acoustic installations at airports, railway stations, public buildings, ...
- Confirm compliance with system specifications and regulations such as IEC 60849, EN 54-24
- Measures speech intelligibility STI-PA according to IEC 60268-16
- Verify 70/100V installations
- Troubleshooting and periodic performance check

Advantages

- Handheld and compact design for field applications
- Stores all test results to SD Card for documentation
- Improved efficiency with dedicated measurements utilizing user-defined start-up profiles and appending test results to previous data records
- Calibrated audio and acoustic measurement system



XL2 Screenshot STI-PA Measurement



NTi Audio TalkBox

XL2 Analyzer Functions

- **Speech intelligibility STI-PA**
Measures public announcement systems according to IEC 60268-16.
- **Sound pressure level SPL**
The XL2 measures all required sound levels. For the system maintenance in occupied building areas a dedicated 18 kHz highpass-filter is provided, thus minimizing annoyance to others.
- **Real time analyzer RTA**
Measures the environmental noise spectrum, to verify the effects on the speech intelligibility STI-PA. A post-processing form combines both measurement data.
- **Polarity**
The left and right speakers shall be verified for the same polarity, thus achieving a broad stereo sound image.
- **Line level RMS and THD+N**
Verifies and troubleshoots the audio system performance.
- **Delay**
Setup of delay line speakers in larger auditoriums, such as churches and conference systems.

Minirator MR-PRO Functions

- **Impedance tester**
Verifies distributed 70/100V loudspeaker installations by measuring the apparent power and phase.
- **Signal generator**
Provides the STI-PA test signal, spoken announcement signals, and other test signals for system verification and fine tuning.
- **Cable tester**
Verifies XLR audio cables for defects including pin 1 test.

NTi Audio TalkBox Functions

- **Acoustic Sound Source**
Generator for speech intelligibility measurements of the complete signal chain including the talker's microphone.



Exel Acoustic Set

Order Information	NTi Audio #
Exel Acoustic Set Class 2 with M4260 Measurement Microphone	600 000 400
Exel Acoustic Set Class 1 frequency response with M2210 Measurement Microphone	600 000 410
NTi Audio TalkBox	600 000 085
MR-PRO 70/100V Protection	600 000 313
STI-PA Option for XL2	600 000 338

For more information please visit www.nti-audio.com/exel.

EXEL Line for Environmental Noise



XL2 Audio and Acoustic Analyzer with
M2210 measurement microphone with
class 1 frequency response



Applications

- Industrial- and community noise pollution monitoring
- Urban noise monitoring and noise mapping according directive 2002/49/EC
- Sound level monitoring and documentation in event areas according to DIN 15905-5, SLV 2007 and SLV 2010-FL
- Outdoor measurement stations (mobile or fixed installations)
- Annoyance assessment of noise according ISO 1996-2
- Remote measurement for integration into customer solution

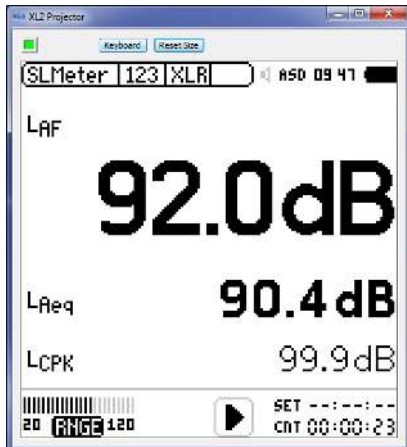
Advantages

- Handheld and compact design for field applications and stand-alone operation
- Predefined measurement profiles according local standards simplify measurements for automated sound level documentation and audio wav-file recording
- Calibrated acoustic test system for traceable measurements



XL2 Analyzer Functions

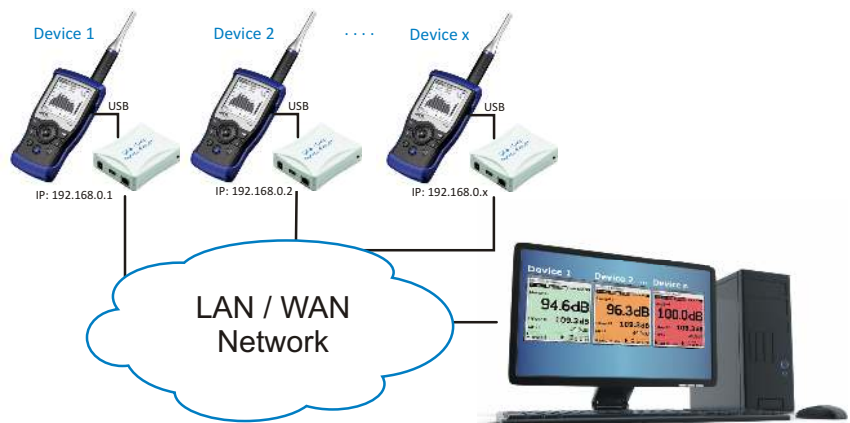
- Sound Pressure Level SPL
Monitors the noise pollution to verify any annoying or excessive noise. All sound levels such as actual, L_{min} , L_{max} , L_{eq} and the sound exposure level L_{AE} are simultaneously measured and logged with frequency weighting A, C, Z and time weightings Fast, Slow and Impulse.
- Rating level L_r
Assesses noise annoyance according ISO 1996-2. The used rating level L_r is calculated as follows: $L_r = L_{Aeq} + K_I + K_T + K_R + K_S$. The correction factors K_I (impulses), K_T (tones and information content), K_R (time of day) and K_S (certain sources and situations) are standardized and differ between countries. The detailed FFT analysis provides the results for the K_T factor.
- Percentiles
Measures statistic sound levels in wideband and the real time spectrum 1%, 5%, 10%, 50%, 90%, 95%, 99% (optional with Extended Acoustic Pack). This e.g. supports the calculation of the Noise Pollution Level $L_{NP} = L_{eq} + (L_{10} - L_{90})$.



Projector Software displays XL2 screen in real-time on connected PC



Stack Light indicates exceeding sound levels



Noise Monitoring Network connect multiple XL2 Analyzers with USB Device Servers



Exel Noise Monitoring Set

Order Information

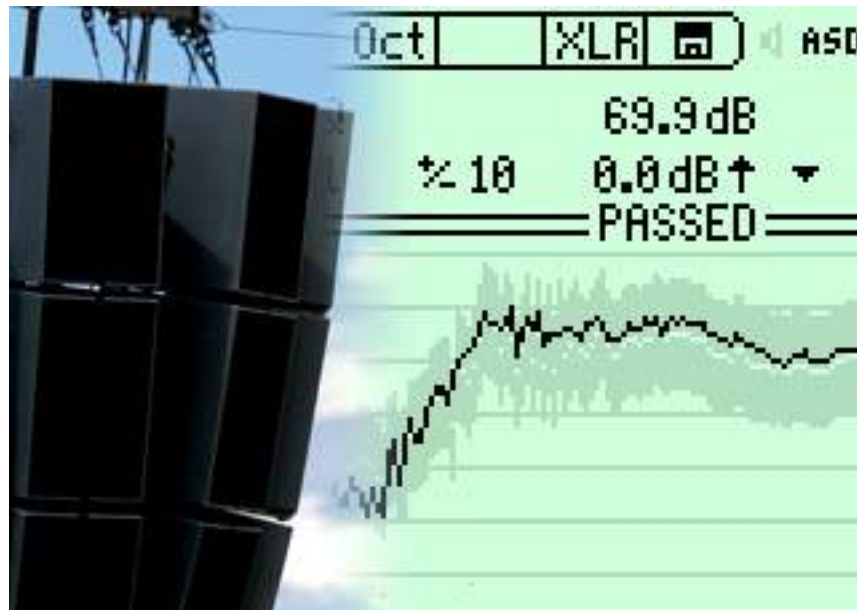
	NTi Audio #
XL2 + M4260, Class 2	600 000 340
XL2 + M2210, Class 1 frequency response	600 000 350
Extended Acoustic Pack	600 000 339
Remote Measurement Option for XL2	600 000 375
Stack Light	600 000 381/382

For more information please visit www.nti-audio.com/exel.

EXEL Line for PA Hire



XL2 Audio and Acoustic Analyzer with
M2210 measurement microphone with
class 1 frequency response



Applications

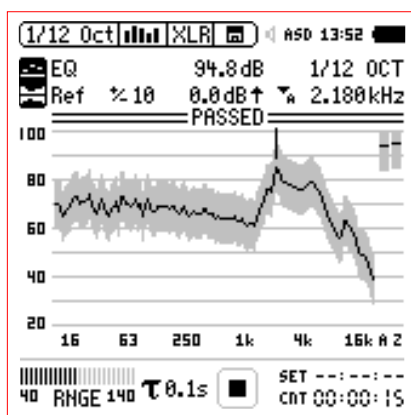
- Inspection of returned speakers and microphones for reliable operation
- Acoustic passed/failed measurements in quality control and service

Advantages

- Handheld and compact design
- Turnkey solution for passed/failed measurements in one unit
- Measurement starts by level trigger, external foot switch or instrument start button
- Improved efficiency with dedicated measurement profiles
- Automated documentation



Stack Light
indicates Passed/Failed result



XL2 Screenshot PASSED result

XL2 Analyzer Functions

- **FFT analysis**
Compares the high-resolution acoustic pattern of any device against a pre-defined reference sample with a pass/fail analysis in linear X-scaling.
- **1/12 octave analysis**
Passed/Failed measurements with selectable 1/1, 1/3, 1/6 or 1/12 octave band resolution in logarithmic X-scaling.
- **Passed/failed measurements**
The XL2 Analyzer captures the frequency spectrum of reference devices, such as engines, rotary motors, fans, vacuum cleaners, etc. and supports generation of tolerance bands based on the captured reference data. Measurements can either be displayed as absolute traces or shown relative to previously stored traces. Frequencies with failed results are individually visualized in every frequency band.
- **Auto-start function**
Measurement starts by automatic level trigger, external foot switch or instrument start button.
- **Stack light**
Provides visual passed/failed indication.
- **Tolerance management**
Tolerance curves can either be imported from txt-files or directly derived from captured measurements.
- **Digital I/O Adapter PCB**
For automated operation with external peripheral devices the XL2 Analyzer can be linked into a programmable logic control. The Digital I/O Adapter is tailored for rail mounting in electric switch boxes.
- **Remote measurement (optional)**
Allows querying the XL2 measurement data online via the USB interface. Thus customers may implement the XL2 in their test application.



Exel Quality Control Set

Order Information

	NTi Audio #
XL2 + M2210, Class 1 frequency response	600 000 350
Remote Measurement Option for XL2	600 000 375
Spectral Limits Option for XL2	600 000 376
Stack Light	600 000 381/382

For more information please visit www.nti-audio.com/exel.

EXEL Line for Broadcast



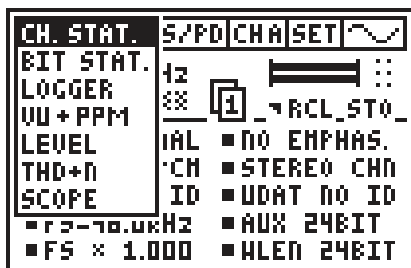
Exel Line: Digirator DR2 with Digilyzer DL1

Applications

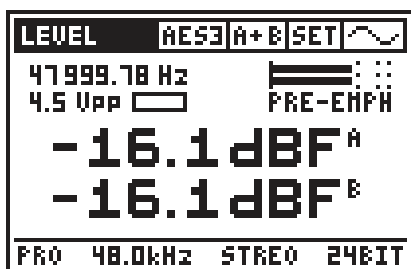
- Alignment of system levels
- Surround sound setup and verification
- Verify system performance of digital and analog audio systems
- Maintenance and periodic performance check
- Applause-meter for live sound events

Advantages

- Dual-domain signal monitoring with installed speaker
- Handheld and powerful signal generator and analyzer
- Improved efficiency with dedicated measurements for digital broadcast systems
- Calibrated digital measurement system



DL1 Screenshot Channel Status



DL1 Screenshot Channel Status



DR2 Screenshot Test Signal Menu



Digital Audio Set

Digilyzer DL1 Functions

- Digital audio analyzer
Testing, monitoring and troubleshooting of digital audio interfaces AES3, S/PDIF, TOS-Link, ADAT, AES 3id (75 Ohm).
- Event logger
Intermittent faults are usually hard to find. The event logger tracks every change of the input signal (carrier-, channel status- or audio related) and allows long term monitoring. Possible problems are highlighted automatically.
- Audio monitoring
The built in speaker allows listening into analog and digital audio lines with an automated gain control.

Digirator DR2 Functions

- Occupation of transmission lines
The signal generator DR2 generates digital voice sequences to occupy broadcast lines until they are required for data transmission. Analog audio systems are served by the MR-PRO.
- Digital delay
Measures the propagation delay between the DR2 output and the XLR sync input (which accepts AES3 signals). Results are displayed in seconds and video frames.
- Transparency of Dolby signals
The DR2 tests whether a transmission channel is transparent for nonlinear PCM signals and indicates if Dolby E, Dolby Digital and/or DTS bit streams can pass.
- Synchronization
The DR2 accepts AES3, DARS, Word Clock and Video Black Burst (PAL and NTSC) synchronization signals. The input impedance of the sync input may be switched between 75 Ohm, 110 Ohm and High Z.

Applause-Meter for Live Sound

- The XL2 Audio and Acoustic Analyzer serves as an applause meter for live shows. It measures the actual applause level and shows the results in big numbers on a connected PC.

Order Information	NTi Audio #
Digital Audio Set includes Digilyzer DL1, Digirator DR2 and accessories	600 000 272
Digilyzer DL1	600 000 200
Digirator DR2	600 000 320
Exel Acoustic Set Class 2 with M4260 Measurement Microphone	600 000 400

For more information please visit www.nti-audio.com/exel.

EXEL Line for Cinemas



Exel Line: Digirator DR2 with
XL2 Audio and Acoustic Analyzer

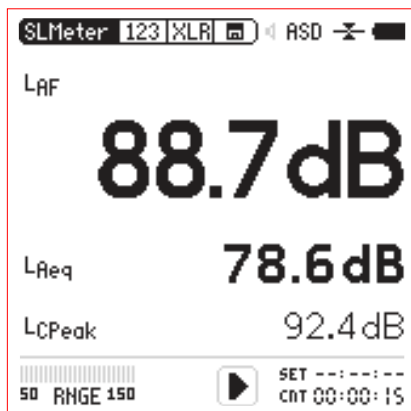


Applications

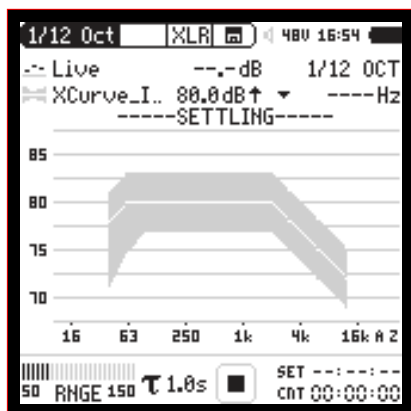
- Surround sound installations for home cinemas and professional installations
- Comparing measurement results against standardized X-Curve with passed/failed result according ISO 2969 or SMPTE 202M
- Commissioning and verification of electro-acoustic installations
- Fine-tuning high-end audio systems according individual preferences for optimized performance
- Maintenance and periodic performance check

Advantages

- Handheld and compact design for field applications
- All measurement results for are stored for documentation to SD Card
- Calibrated audio and acoustic measurement system



XL2 Screenshot Sound Level Meter



XL2 Screenshot 1/12 Octave
X-Curve Reference Spectrum
with Tolerance according to ISO 2969

XL2 Analyzer Functions

- Sound pressure level SPL
Sound levels alignment of individual speakers and setup of LFE channel about 10dB SPL higher than the surround level.
- Real time analyzer RTA
Fine tuning the system performance with pink noise at each seating position. The reference spectra of speakers may be captured for comparative measurements, thus achieving the same sound performance of all speakers.
- 1/12 octave analysis
Loading standardized X-Curve tolerance bands according to ISO 2969 or SMPTE 202M for reference measurements with selectable 1/1, 1/3, 1/6 or 1/12 octave band resolution.
- FFT analysis
Analysis of reflections and cancellations (comb filter effects) for improving the room architecture and speech intelligibility.
- RT60 reverberation time
Verifies the room acoustics for optimized system performance and speech intelligibility.
- Polarity
All speakers shall be verified for the same polarity, thus achieving a broad stereo or surround sound image.
- Delay
Setup of acoustical delays for optimized surround sound performance.

Digirator DR2 Functions

- Surround Sound Signal Generator
Provides all test signals for system verification and fine tuning.



Exel Acoustic Set

Order Information	
Exel Surround Set Class 2, including XL2+M4260 and Digirator DR2	
Exel Surround Set Class 1 frequency response including XL2+M2210 and Digirator DR2	
XL2 + M4260, Class 2	600 000 340
Spectral Limits Option for XL2	600 000 376
Digirator DR2	600 000 320

For more information please visit www.nti-audio.com/exel.

EXEL Line for AVI-Installations



Exel Line: NTi Audio TalkBox with
XL2 Audio and Acoustic Analyzer



Applications

- Conference and tele-presence system installations
- Commissioning and verification of electro-acoustic installations
- Confirm compliance with manufacturers system specifications
- Tune and optimize audio systems
- Maintenance and periodic performance check

Advantages

- TalkBox offers a calibrated sound source for objective simulation of speaking persons into a microphone
- Improved and verified speech intelligibility STI-PA at each seat in the conference room
- All measurement results for are stored for documentation to SD Card



XL2 Screenshot STI-PA Measurement

XL2 Analyzer Functions

- Sound pressure level SPL
Setting up of sound levels for best performance.
- Real time analyzer RTA
Fine tuning the system performance with pink noise. The reference spectra of speakers may be captured for comparative measurements, thus achieving the same sound performance.
- 1/12 octave analysis
Loading standardized X-Curve tolerance bands according ISO 2969 or SMPTE 202M for reference measurements with selectable 1/1, 1/3, 1/6 or 1/12 octave band resolution.
- FFT analysis
Analysis of reflections and cancellations (comb filter effects) for improving the room architecture and speech intelligibility.
- RT60 reverberation time
Verifies the room acoustics for optimized system performance and speech intelligibility.
- Polarity
All speakers shall be verified for the same polarity, thus achieving a broad stereo sound image.
- Line level RMS and THD+N
Verifies and troubleshoots the audio system performance.
- Speech intelligibility STI-PA
Measures the speech intelligibility of conference systems using the TalkBox as signal source.



Exel Line: Minirator MR-PRO generates test signals

NTi Audio TalkBox Functions

- Acoustic Sound Source
The NTi Audio TalkBox generates the acoustic and line reference signals for system verification and speech intelligibility measurement.

Minirator MR-PRO Functions

- Signal Generator, Cable Tester



Exel Acoustic Set

Order Information	NTi Audio #
Exel Acoustic Set Class 2, with M4260 Measurement Microphone	600 000 400
Exel Acoustic Set Class 1 frequency response with M2210 Measurement Microphone	600 000 410
NTi Audio TalkBox	600 000 085
Spectral Limits Option for XL2	600 000 376

For more information please visit www.nti-audio.com/exel.

EXEL Line for Building Acoustics



Exel Line: Minirator MR-PRO with
XL2 Audio and Acoustic Analyzer

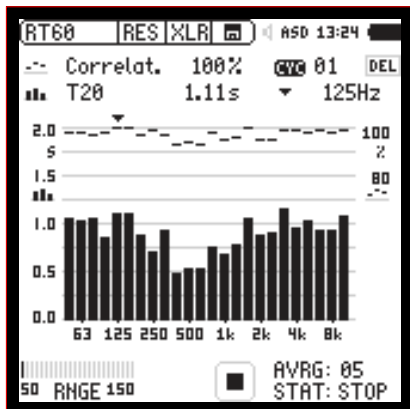


Applications

- Air borne and structure borne sound insulation measurement between rooms or indoor-outdoor areas
- Confirm compliance according ISO 140
- Impact noise measurements
- Qualification of speech intelligibility STI-PA
- Wav-file recording of impulse response for offline calculations

Advantages

- Handheld and compact design for field applications
- High resolution wav-file recording in 24 Bit / 48 kHz format to internal SD Card
- Improved efficiency with dedicated measurements profiles
- Calibrated acoustic measurement system for traceable measurements



XL2 Screenshot RT60 Measurement

XL2 Analyzer Functions

- Sound pressure level SPL
The XL2 measures the sound insulation between rooms or indoor-outdoor areas. The impact sound insulation, e.g. foot steps, is measured by using a tapping machine. The level difference between two rooms needs to be corrected with the influence of the background noise in the receiving room.
- Real time analyzer RTA
The real time analyzer measures the actual acoustic spectrum for sound insulation verification depending on the frequency. The sound insulation is measured at different room positions in 1/1 or 1/3 octave band resolution. The averaged result provides a single number insulation index.
- RT60 reverberation time
The level difference between two rooms needs to be corrected with any influence of the reverberation time in the receiving room. The reverberation time measurement offers automated triggering for repeated tests using an impulse signal or gated pink noise as signal source.
- Speech intelligibility STI-PA
Measures public announcement systems according to IEC 60268-16.



NTi Audio TalkBox

Minirator MR-PRO Functions

- Signal Generator
Provides measurement signals for room and building acoustics, such as band limited pink noise, customized wav-files and the STI-PA test signal.

TalkBox Functions

- Acoustic Sound Source
The NTi Audio TalkBox generates the STI-PA test signal acoustically for speech intelligibility measurements.



Exel Acoustic Set

Order Information	NTi Audio #
Exel Acoustic Set Class 2, with M4260 Measurement Microphone	600 000 400
Exel Acoustic Set Class 1 frequency response with M2210 Measurement Microphone	600 000 410
NTi Audio TalkBox	600 000 085
STI-PA Option for XL2	600 000 338
Extended Acoustic Pack for XL2	600 000 339

For more information please visit www.nti-audio.com/exel.

XL2 Analyzer for Occupational Health



XL2 Audio and Acoustic Analyzer with
M2210 measurement microphone with
class 1 frequency response

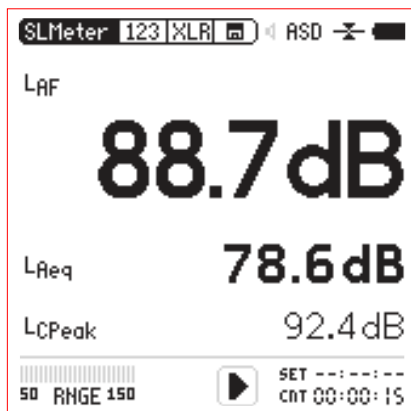


Applications

- Measure noise exposure at work according directive 2003/10/EC
- Confirm compliance with health standards ISO 1999:1990
- Prevent hearing loss at work

Advantages

- Handheld and compact design for field applications
- Calibrated acoustic measurement system
- Improved efficiency with dedicated measurements profiles and appending test results to previous data records
- Automated sound level documentation and high resolution wav-file recording in 24 bit / 48 kHz format to SD Card



XL2 Screenshot Sound Level Meter



Stack Light
alarms at exceeding sound levels



Exel Occupational Health Set

XL2 Analyzer Functions

- Sound pressure level SPL for industrial sound pollution monitoring
 L_{Aeq} (= averaged sound level with A-weighting)
 L_{Cpeak} (= peak sound level with C-weighting)
- Stack Light
 Alarms at exceeding sound levels, thus employees near the test station are notified immediately.

Noise exposure level $L_{EX,8h}$

The Noise at Work Directive 2003/10/EC reduces the risk of hearing damage for employees. The action limits are

	$L_{EX, 8h}$	L_{Cpeak}	Action
Lower limit value	80 dB(A)	135 dB	recommend wearing hearing protectors
Upper limit value	85 dB(A)	137 dB	hearing protectors must be worn and noise level reduced as possible
Exposure limit	87 dB(A)	140 dB	employee with hearing protectors shall never exceed this limits

Determination of Noise Exposure Level $L_{EX,8h}$

- At steady noise (applies for L_{AS} deviation < 5 dB):
 Measure the L_{Aeq} over a few minutes, the resulting L_{Aeq} represents the noise exposure level of the complete 8 hours period $L_{EX,8h} = L_{Aeq}$.

The following formula applies for a daily exposure time $\neq 8$ hours: $L_{EX,8h} = L_{Aeq} + 10 \times \log (T / 8 \text{ hours})$

- At steady noise with stepwise level variations (applies for steady noise at clearly distinguishable levels): Measure the L_{Aeq} at the different levels and note the corresponding exposure time. Enter all data in the NTi Audio noise exposure level post processing form; the $L_{EX,8h}$ will be calculated and displayed.
- At varying noise levels $L_{EX,8h} = L_{Aeq}$ measured for 8 hours.

Order Information

	NTi Audio #
XL2 + M4260, Class 2	600 000 340
XL2 + M2210, Class 1 frequency response	600 000 350
Stack Light	600 000 381/382

For more information please visit www.nti-audio.com/exel.

EXEL Line for Quality Control



XL2 Audio and Acoustic Analyzer with M2210 measurement microphone with class 1 frequency response



Applications

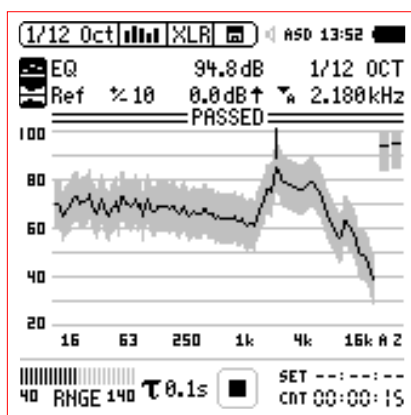
- Machine condition monitoring for acoustics and vibration
- Passed/Failed measurement of acoustic and vibration spectra's in production, quality control and service
- Long-term condition monitoring

Advantages

- Handheld and compact design
- Turnkey solution for passed/failed measurements in one unit
- Measurement starts by level trigger, external foot switch or instrument start button
- Improved efficiency with dedicated measurement profiles
- Automated documentation



Stack Light
indicates Passed/Failed result



XL2 Screenshot PASSED result

XL2 Analyzer Functions

- FFT analysis
Compares the high-resolution acoustic pattern of any device against a pre-defined reference sample with a pass/fail analysis in linear X-scaling.
- 1/12 octave analysis
Passed/Failed measurements with selectable 1/1, 1/3, 1/6 or 1/12 octave band resolution in logarithmic X-scaling.
- Passed/failed measurements
The XL2 Analyzer captures the frequency spectrum of reference devices, such as engines, rotary motors, fans, vacuum cleaners, etc. and supports generation of tolerance bands based on the captured reference data. Measurements can either be displayed as absolute traces or shown relative to previously stored traces. Frequencies with failed results are individually visualized in every frequency band.
- Auto-start function
Measurement starts by automatic level trigger, external foot switch or instrument start button.
- Stack light
Provides visual passed/failed indication.
- Tolerance management
Tolerance curves can either be imported from txt-files or directly derived from captured measurements.
- Digital I/O Adapter PCB
For automated operation with external peripheral devices the XL2 Analyzer can be linked into a programmable logic control. The Digital I/O Adapter is tailored for rail mounting in electric switch boxes.
- Remote measurement (optional)
Allows querying the XL2 measurement data online via the USB interface. Thus customers may implement the XL2 in their noise monitoring application.



Exel Quality Control Set

Order Information

	NTi Audio #
Acoustic Measurements XL2 + M2210, Class 1 frequency response	600 000 350
Vibration Measurements XL2 + ICP Power Adapter	600 000 330 & 600 010 223
Remote Measurement Option for XL2	600 000 375
Spectral Limits Option for XL2	600 000 376
Stack Light	600 000 381/382

For more information please visit www.nti-audio.com/exel.

XL2 Analyzer for Vehicle Noise Inspection



XL2 Audio and Acoustic Analyzer with
M2210 measurement microphone with
class 1 frequency response

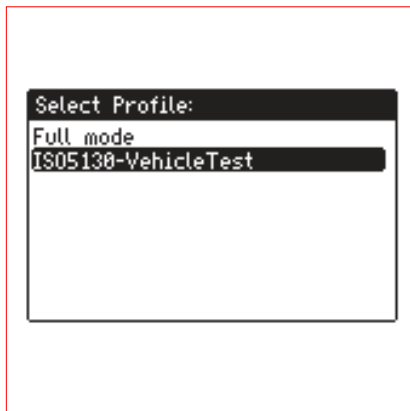


Applications

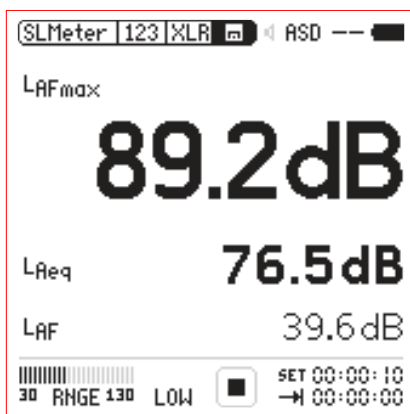
- Measuring exhaust noise level of stationary power-driven road vehicles according ISO 5130:2007 and §29 StVZO by authorities and police inspectors
- Annual inspection and survey of road vehicles
- Type approval of road vehicles

Advantages

- Simple operation by one person
- Calibrated sound level meter with class 1 frequency response according to IEC 61672
- Complete measurement kit including tripod and tape
- Improved efficiency by dedicated measurement profiles
- Automated sound level documentation and wav-file logging



Profile Selection at Start-up



ISO5130 Measurement Result



Exel Set for Vehicle Noise Inspection

XL2 Analyzer Functions

Sound pressure level SPL

LAFmax, maximum sound level with A-weighting

LAeq, averaged sound level for environmental noise verification

How to measure

- The environmental noise LAeq shall be at least 10 dB below the measured A-weighted exhaust noise level.
- Position the measurement microphone directed towards the exhaust pipe at a distance of 0.5 m at a 45° angle in the same height; the height shall be minimum 0.2 m above ground.
- Connect the XL2 Analyzer with the 5 m ASD cable to the measurement microphone.
- Start the XL2 with the measurement profile ISO 5130
- Increase the engine speed gradually from idle to the measurement rpm according the table below:

Rated engine speed	Measurement rpm	Application
< 5000 rpm	75% of rated rpm	road vehicles having at least four wheels
5000 - 7500 rpm	3750 rpm	any road vehicles
> 7500 rpm	50% of rated rpm	any road vehicles

- Start the measurement.
- Hold the measurement rpm for one second and release the throttle control rapidly, thus the engine speed returns to idle.
- The measurement stops automatically after the entire deceleration period.
- Repeat the measurement until LAFmax is within +/- 2 dB for three consecutive measurements.
- The final result is calculated as average of these 3 measurement results.

Order Information

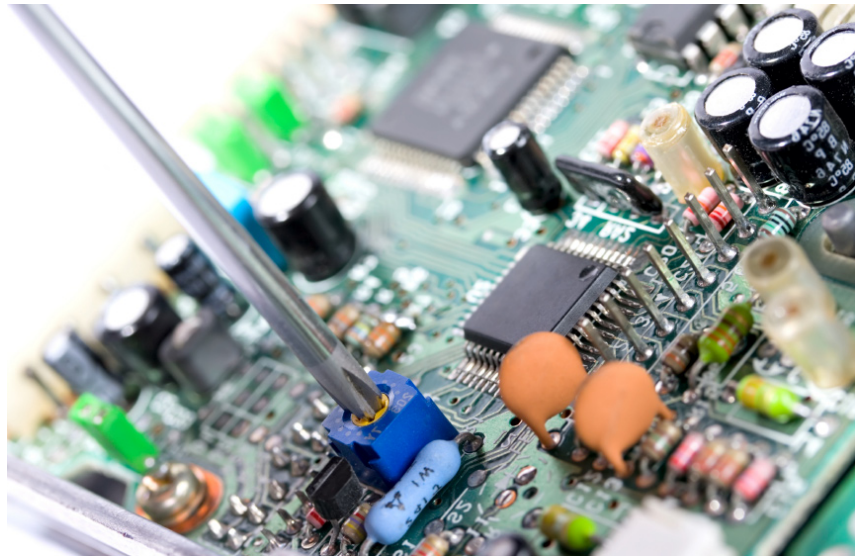
	NTi Audio #
Vehicle Noise Inspection Set, including XL2 + M2210, Class 1 frequency response	special

For more information please visit www.nti-audio.com/exel.

EXEL Line for R&D and Service



Exel Line for analog audio:
Minirator MR-PRO with
XL2 Audio Analyzer



Applications

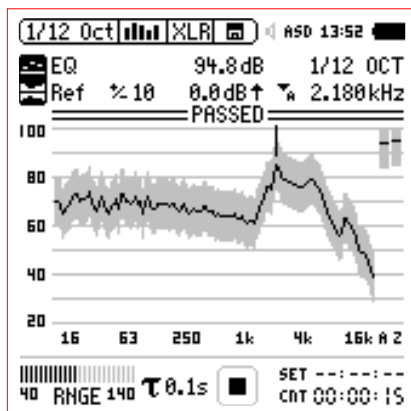
- Development of audio or acoustic devices
- Troubleshooting, service and repair
- Verifying equipment specifications

Advantages

- Handheld and compact design for desktop measurements
- Superior specifications with signal input from -112 dBu (2 μ V) up to 30 dBu (25 V)
- Residual distortions of XL2 typically < -100 dB (0.001 %)
- High-resolution FFT for narrowband analysis, 5 Hz to 20 kHz
- Calibrated measurement system for analog audio, digital audio and acoustics



Exel Line for digital audio:
Digirator DR2 with Digilyzer DL1



XL2 Screenshot PASSED result



XL2 Screenshot Audio Analyzer

XL2 Analyzer Functions

- Line level RMS and THD+N
Measures level, distortion (THD+N) and frequency simultaneously for compliance verification to specifications.
- Residual noise listening
The internal XL2 speaker offers audible monitoring of the test signal or the residual distortion.
- 1/12 octave analysis
Measures input spectrum in selectable 1/1, 1/3, 1/6 or 1/12 octave band resolution with logarithmic X-scaling for performance testing with e.g. pink noise.
- FFT analysis
High-resolution Zoom-FFT up to 0.4 Hz steps in the frequency range 5 Hz - 20 kHz.
- Passed/failed measurements
The XL2 Analyzer captures the frequency spectrum of reference devices and generates tolerance bands based on the captured reference data. Measurements can either be displayed as absolute traces or shown relative to previously stored traces. Frequencies with failed results are individually visualized in every frequency band.
- Polarity
Checks polarity of balanced audio lines.

Minirator MR-PRO Functions

- Provides signal generator and impedance tester

Digital Audio Functions

- Digital Audio Analyzer: Digilyzer DL1
Testing, monitoring and troubleshooting of digital audio interfaces is fast and straight forward using the compact DL1.
- Digital Signal Generator: Digirator DR2
Provides high quality digital test signals and Dolby/DTS surround sound signals.



Exel Audio Set

Order Information		NTi Audio #
Exel Analog Audio Set contains XL2 Analyzer, Minirator MR-PRO, essential accessories packed in the protective Exel system case		600 000 400
Digital Audio Set includes Digilyzer DL1, Digirator DR2 and accessories		600 000 272

For more information please visit www.nti-audio.com/exel.

EXEL Line for Education and Training



Exel Line: Minirator MR-PRO with
XL2 Audio and Acoustic Analyzer

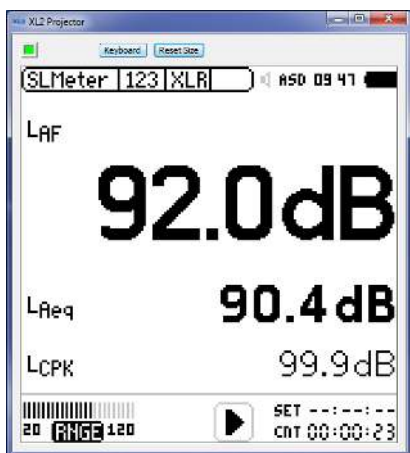


Applications

- Schools for analog audio, digital audio and acoustics
- Presentations with online measurements
- Qualification of speech intelligibility STI-PA in class rooms

Advantages

- Handheld and compact design for training
- Instrument screen displayed online on PC monitor
- Unmatched price-performance ratio for education institutes
- Calibrated acoustic measurement system



Projector Software displays XL2 screen in real-time on connected PC

XL2 Analyzer Functions

- **Projector Software**
Displays the XL2 screen in real-time via USB on the connected PC. The virtual keyboard enables the user to control the XL2 Analyzer with mouse clicks from the PC.
- **Sound pressure level SPL**
Measures sound levels and analyzes the acoustic spectrum, e.g. for fine tuning the performance of sound installations with pink noise.
- **1/12 octave analysis**
Measures input spectrum in selectable 1/1, 1/3, 1/6 or 1/12 octave band resolution with logarithmic X-scaling for performance testing with e.g. pink noise.
- **FFT analysis**
High-resolution Zoom-FFT up to 0.4 Hz steps in the frequency range 5 Hz - 20 kHz, e.g. for the analysis of reflections (comb filter effects) to improve the room architecture and speech intelligibility.
- **RT60 reverberation time**
Verifies the room acoustics for optimized system performance and speech intelligibility.
- **Polarity**
The left and right speakers shall be verified for the same polarity, thus achieving a broad stereo sound image.
- **Line level RMS and THD+N**
Measures level, distortion (THD+N) and frequency.
- **Speech intelligibility STI-PA**
Measures announcement systems according IEC 60268-16.

Minirator MR-PRO Functions

- Signal Generator, Cable Tester, Impedance Tester

Digital Audio Functions

- Digital Audio Analyzer: Digilyzer DL1
- Digital Signal Generator: Digirator DR2



Exel Acoustic Set

Order Information	NTi Audio #
Exel Acoustic Set Class 2, with M4260 Measurement Microphone	600 000 400
Exel Acoustic Set Class 1 frequency response with M2210 Measurement Microphone	600 000 410
Digital Audio Set includes Digilyzer DL1, Digirator DR2 and accessories	600 000 272

For more information please visit www.nti-audio.com/exel.