

+

 Made in Switzerland

Audio & Acoustic

TEST AND MEASUREMENT SOLUTIONS



XL2 – the multi-functional Analyzer

The XL2 is a powerful Sound Level Meter, a professional Audio and Acoustic Analyzer, as well as a substantial Vibration Meter in one device. The XL2-TA version is a Type Approved sound level meter.

Made by Professionals for Professionals



Intuitive Operation – available within seconds!

The instinctive interfaces are suitable for professionals and newcomers alike. The instrument can be configured with simple or comprehensive measurement parameters, or with predefined profiles, without first having to read the user manual.

Ready for any Challenge

The considerable choice of functions have been optimized for a wide range of measurement applications, such as electro-acoustic design and installation, public address and voice alarm systems, environmental noise monitoring, room and building acoustics, live events, occupational safety, and automated quality control.



XL2 Sound Level Meter, Audio and Acoustic Analyzer

A Precision Instrument

Microphones to suit your requirements:

MODEL	DESCRIPTION
M2230	Certified Class 1 measurement microphone, Type Approved
M2230-WP	Certified Class 1 Outdoor measurement microphone, Type Approved
M2211	Class 1 frequency response, for general measurements
M2215	Class 1 frequency response, for high acoustic levels
M4261	Cost-effective Class 2 measurement microphone

Unpack. Connect. Measure.

All microphones are 48 V phantom powered and include an electronic data sheet; as soon as a microphone is attached to the XL2, the sensitivity of the microphone is automatically detected – this prevents incorrect measurements due to improper microphone sensitivity configuration.

The XL2 and microphone are calibrated in accordance with IEC 61672-3 (periodic testing of sound level meters). The references used are based on national standards.



Vibration Meter



The Vibration Option turns the XL2 into a Vibration Meter, for the inspection of machine parts. In combination with our smart ICP adapter, which stores the calibration data of the vibration sensor, the XL2 differentiates between an accelerometer and a microphone and automatically switches to the corresponding measuring mode.

Acceleration, Velocity and Displacement

The device measures acceleration for frequencies down to 0.7 Hz and determines the speed and displacement. A variety of application-specific filters and time weightings are available. The data logger records all measured data in plain text format.

Spectral Analysis

Simultaneously, the XL2 calculates the vibration spectrum as an FFT and in octave or 1/3rd octave resolution in the range of 0.8 Hz to 2.5 kHz, while a cursor automatically indicates the dominant frequency. You can also save a reference spectrum on the meter for comparison with the current spectrum.

Live Event Monitoring



Use the XL2 Acoustic Analyzer to set up sound systems and monitor sound levels in the venue and in the neighborhood during live events.

Let the XL2 Help You to Create a Great Sound

Troubleshoot with the XL2 by measuring balance, level, and signal-to-noise ratio. Also, the built-in reference memory helps you to match the spectrums of the right and left speaker arrays, as well as the monitors. Improve the acoustics for the audience by ensuring uniform polarity of all speakers and optimizing the delay lines.

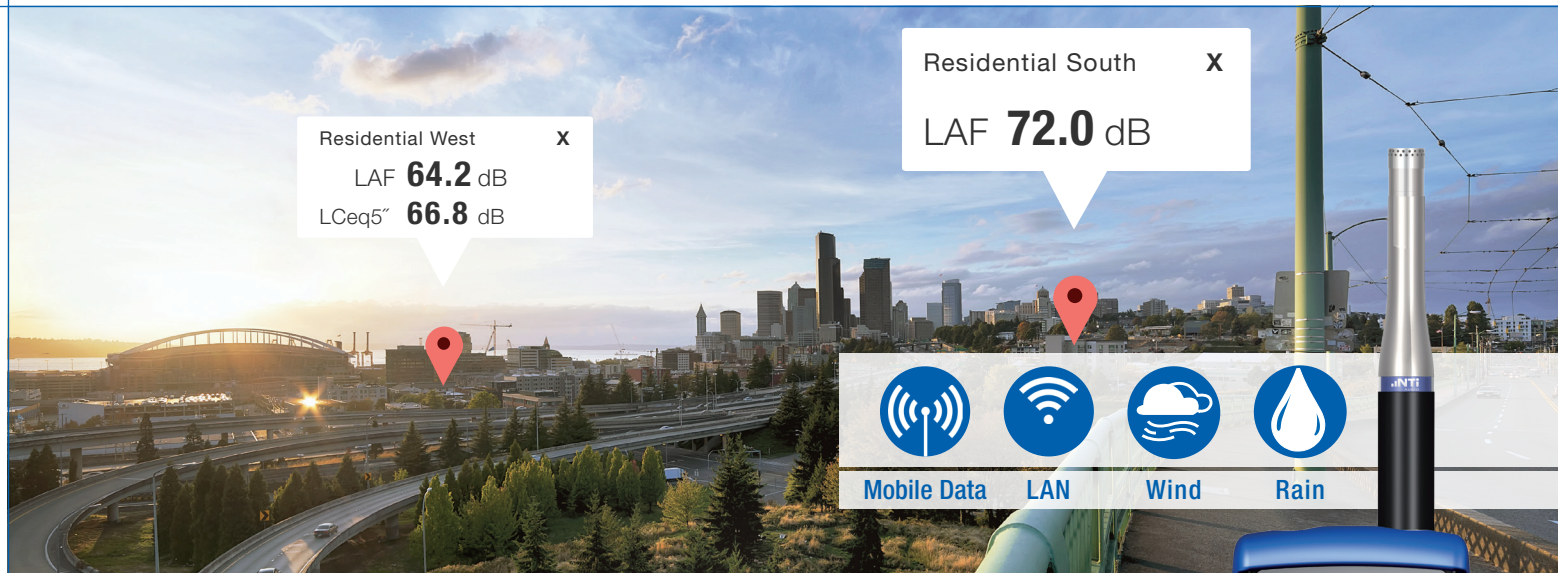
Comply with Sound Limits

The XL2 helps you to comply with the legal requirements of the DIN15905-5, DIN45645 and the Swiss V-NISSG standards, showing you the levels on the display, with the colored limit LED or, with the Projector PRO PC software, on the connected PC or Mac. At the same time, the XL2 records the event as an audio file for later analysis.



Projector PRO PC software for Visualization

Unattended Monitoring with NoiseScout



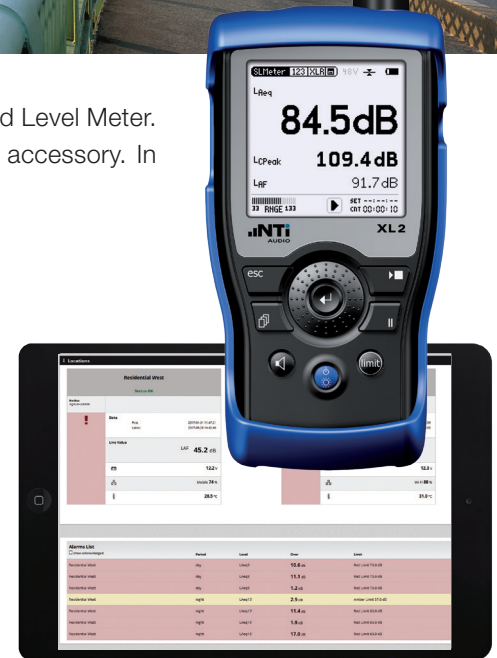
NoiseScout offers effortless and comprehensive noise monitoring with the XL2 Sound Level Meter. The monitoring station is connected via mobile network or LAN using the NetBox accessory. In addition, an external weather station and a GPS Sensor can be connected.

Noise Monitoring through a Web Browser

Noise is recorded by the XL2 and presented live on the NoiseScout website. Alarm emails inform the user when a limit is exceeded at the site. In such cases, audio recordings of the loudest events, as well as the ability to listen in live to the monitoring station, allow for immediate identification of the cause of the noise.

Gateway to the Sound Level Meter

Alternatively, our Gateway server allows remote control of the XL2 and direct access to all measurement data. Sound levels, spectra and audio files can be downloaded during the ongoing measurement.



NoiseScout Portal

Environmental Noise Measurements



M2230-WP
Measurement
Microphone

The XL2 Sound Level Meter has all the features needed to measure and monitor noise. The device measures all the relevant levels simultaneously and, if needed, will record an audio file during the entire measurement or on triggered events.

Weatherproof

The M2230-WP is a type-approved measurement microphone for the precise detection of noise levels in an outdoor environment.

The weatherproof case protects the sound level meter against adverse weather conditions while monitoring industrial and neighborhood noise. The protective case offers plenty of room for batteries and other accessories.

Professional Reports with Data Explorer

For post-processing, the measurement data, including all events, can be loaded from the measurement device, or from the NtI Audio NoiseScout web portal, into the Data Explorer PC software and comprehensively analyzed. The Data Explorer automatically marks tonal and impulsive sounds and calculates the Rating Level L_r .



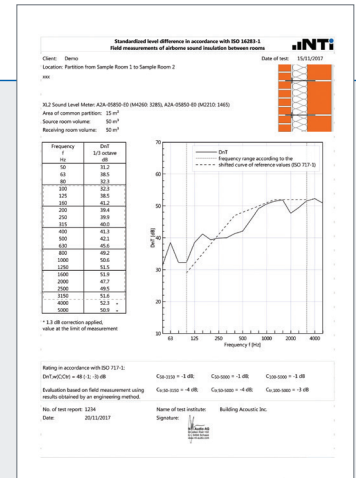
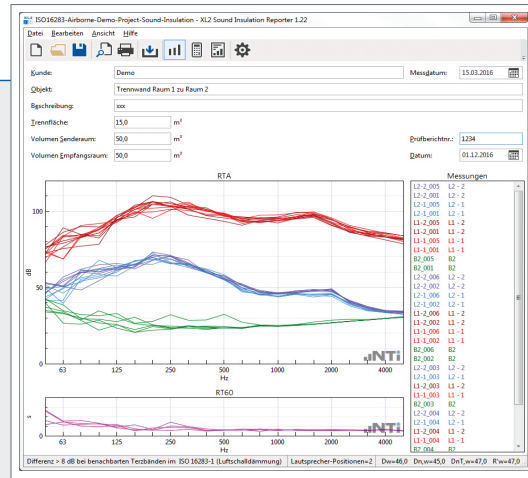
NetBox



Weatherproof Protection Case

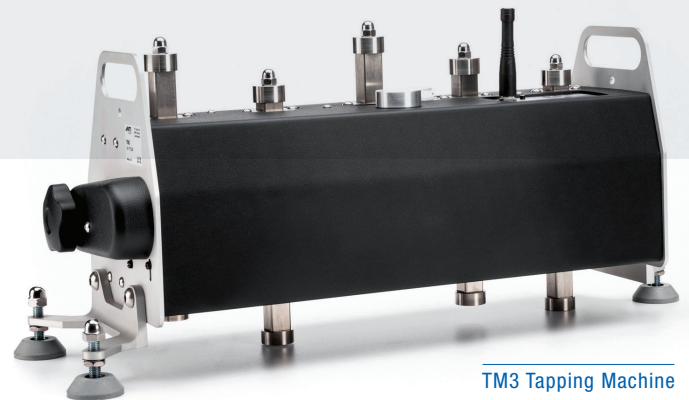
Building Acoustics

The portable Building Acoustics Set is ideal for use on site to determine the airborne, impact and facade sound insulation.



Sound Source in Accordance with ISO 16283

The DS3 Omnidirectional Dodecahedron Loudspeaker provides 121 dB of sound power with an equalized frequency response, and weighs only 7.5 kg. The type-approved TM3 Tapping Machine is available for impact sound analysis.



TM3 Tapping Machine

Simultaneous Measurement in the Sending and Receiving Rooms

The XL2 Sound Level Meter measures the acoustic spectrum in the sending and receiving rooms. If you have two or more XL2s, you can trigger the measurement remotely and record in parallel. The XL2 can be remotely controlled in the broadcasting room via a WLAN access point.

Professional Measurement Report

The Sound Insulation Reporter PC software provides detailed data analysis and produces the standardized sound insulation measurement reports.

Room Acoustics



With the Room Acoustics Set you can analyze the acoustic conditions in enclosed spaces, such as residences, classrooms, auditoriums, offices, theaters, concert halls, and railway stations.

Precision with the DS3 Dodecahedron Speaker Set

The DS3 Dodecahedron Speaker Set generates the omnidirectional sound field required for the analysis of room acoustics. The power is supplied by the portable PA3 Power Amplifier, which includes a built-in noise generator with an equalized output signal specifically designed for DS3 Loudspeakers.

Optimizing the Room Acoustics

The XL2 Sound Level Meter measures the sound pressure levels created by the generated sound signals, and also measures the background noise and the Reverberation Time. The data reports are created by the Room Acoustics Reporter PC software, which also has the ability to simulate the impact of a virtual addition of sound-absorbing materials in the room. The final measurement report compares the reverberation time before and after the improvements have been made.



DS3 Dodecahedron Loudspeaker and PA3 Power Amplifier

Voice Alarm System Commissioning



Speech Intelligibility STI

Voice alarm systems in airports, railway stations, shopping malls or concert venues need to deliver understandable announcements in case of emergencies.

The XL2 Acoustic Analyzer measures the speech intelligibility of paging systems and voice alarm systems in accordance with the IEC 60268-16 and DIN VDE 0833-4 standards. The device determines STI and CIS speech intelligibility values and is particularly efficient in the verification of demanding rooms where many measuring points are required.

You can record or manually add ambient noise before or after the measurement, and see what effect that has on the speech intelligibility value. The average and the statistical deviation of several measurements is automatically calculated. The STIPA Reporting tool helps you create professional reports.

Acoustic Sound Source for STIPA



Calibrated. Reference. Perform.



TalkBox

TalkBox – STIPA Reference Sound Source

In order to test the entire signal chain from an announcer's lips to the audience's ears, the announcement microphone and the acoustics of the control room must also be considered in the measurement.

The NTi Audio TalkBox is an acoustic reference sound source designed for this end-to-end measurement of the speech intelligibility of announcement systems. The TalkBox generates a standardized IEC 60268-16 STIPA test signal that emulates an announcer with a sound level of 60 dBA at a distance of one meter. In this way, an actual announcer is emulated during a STIPA measurement. In addition, the TalkBox offers other test signals such as sine, pink and white noise. The TalkBox generates test signals with very little harmonic distortion over the frequency range of 100 Hz to 10 kHz for repeatable and accurate speech intelligibility measurements.

Each TalkBox is individually calibrated in our anechoic chamber. The built-in DSP with FIR filter technology equalizes the signal in both magnitude and phase for a perfectly flat frequency response.

Minirator MR-PRO



The MR-PRO is a powerful signal generator for professionals. The device generates audio test signals of the highest quality, including sine, pink and white noise, polarity and delay test signals, chirps, and sweeps.

Play Custom WAV Files

A collection of WAV files is stored in the internal flash memory. You can also upload your personal test signals to the device and play them from there.

Versatile Troubleshooter

The continuous display of the connected impedance, load symmetry, phantom voltage and the integrated cable test help with fast troubleshooting.

The MR2 Minirator is a simpler version of MR-PRO with reduced functionality.



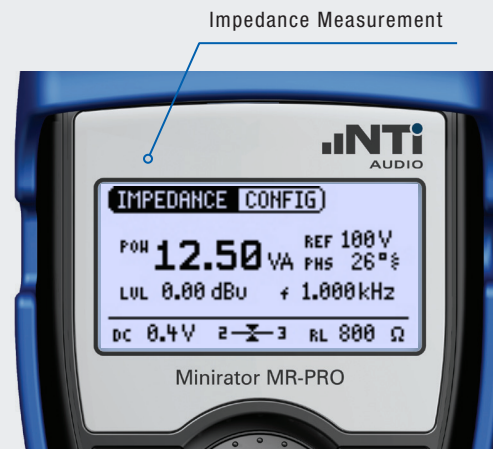
Minirator MR-PRO

Flexible Sound Generator – Impedance Meter



Flexible WAV File Playback

If you have specific measurement requirements, and need a particular test signal in the generator, the USB interface allows you to feed a multitude of different signal types into the MR-PRO.



Impedance Measurements

The MR-PRO can determine the complex impedance of a connected load, such as a row of 100 V loudspeakers, with magnitude and phase at freely-selectable frequencies.

Optionally, the MR-PRO can also display the apparent power with the associated phase angle instead of the connected impedance.

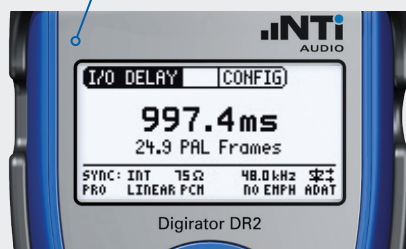
The measurement result allows easy and effective verification of the wiring of a connected 100 V speaker line or detects incorrectly-connected or defective speakers. Useful for troubleshooting: when playing sinusoidal signals, the impedance and the symmetry are displayed.

Digirator DR2

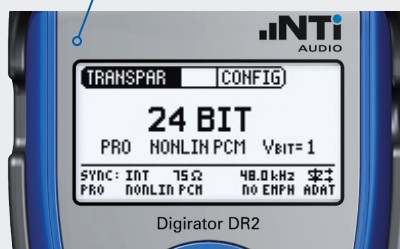
Professional. Comprehensive. Ready.



Channel propagation delay measurement



Channel transparency measurement



Signal Generator for Digital Audio

The Digirator DR2 is a digital reference signal generator with AES3, S/PDIF and ADAT outputs. It provides high-quality audio test signals, such as sine, pink or white noise, polarity and delay test signals, chirps, and sweeps. The DR2 also creates surround sound test sequences for reviewing and reconciling professional Dolby Digital, Dolby E, and DTS installations.

The highly-stable, internal clock generator can be synchronized to AES3, DARS, Word Clock and video signals. In addition, the DR2 measures the channel transparency, channel propagation delay and sample frequency.



Digirator DR2

Digilyzer DL1

The Digilyzer is an indispensable tool for checking digital transmission and evaluating signal quality. It helps analyze the status parameters as well as troubleshooting, and answers the following questions:

- What does the digital audio signal sound like (acoustic output speaker)?
- What is the digital level?
- Which harmonic distortions are in the signal?
- What is the frequency response of the digital system?
- What is the Channel Status?
- How many bits are active? Is one hanging?
- Does the Status change during playback?

Analyzer for Digital Audio

The Digilyzer DL1 is a powerful yet easy-to-use digital audio analyzer that supports the AES3, S/PDIF, TOSLINK and ADAT interfaces with sampling frequencies up to 96 kHz.

With helpful and time-saving functions such as an integrity check, built-in monitoring loudspeaker, event logger, and audio lens, the comparison, monitoring and troubleshooting of digital audio interfaces is greatly simplified.

Data Logging direct to a PC Drive

With the Minilink PC Software, measurements and log files can be transferred to the hard drive of a PC and viewed as a spreadsheet.



Digilyzer DL1

Flexus FX100



Flexus FX100 Audio Analyzer

Professional Analog and Digital Audio Analyzer

The FX100 is a professional audio analyzer that is designed to be tailored to fit your application. The device offers a variety of analysis functions, and provides customer-specific evaluation of the results. Powerful DSPs allow measurement cycles of under 1 second. The two-channel base unit can be expanded with two additional full channels, impedance modules, switchable inputs and outputs, or a digital audio interface.

Fast. Precise. Reliable.

Time is Money

Test engineers are often under time pressure to commission a new production test. The FX100 Analyzer provides easy system integration for rapid testing of electroacoustic products. Thanks to the consistent performance-optimized design, the instrument delivers with impressive speed.

User-friendly

Experience how easy the operation of a measuring device can be. Thanks to its sophisticated design, the FX-Control PC software provides intuitive handling of measurement and test sequences.

First-class Support

All FX100 customers benefit from local and expert advice. Our subsidiaries and partners provide you with a first-class, globally-available service network. Free firmware and software updates complete the service package.

Swiss Precision

Sturdy electronics, powerful DSPs and sophisticated algorithms ensure that measurements, including a Pass/Fail rating, are executed as quickly as possible in real time.

Customized Solutions

Thanks to its modular concept, the FX100 Audio Analyzer fulfills almost every requirement. By selecting the appropriate plug-in modules, you can create exactly the configuration your application needs.



FX100 with Channel Extension and Input Switcher

EXTENSION MODULES

Channel Extension 2 CH -> 4 CH # 600 060 010	Output Switcher FX-OS # 600 060 016	Input Switcher FX-IS # 600 060 013	Speaker Impedance FX-SIH (25mA–10A) # 600 060 021	Speaker Impedance Power FX-SIP # 600 060 022	Filter for Class D Amplifier FX-DF # 600 060 026	Digital Audio FX-AES # 600 060 024

Proven Technology for Acoustic Quality Control

Wishes Come True

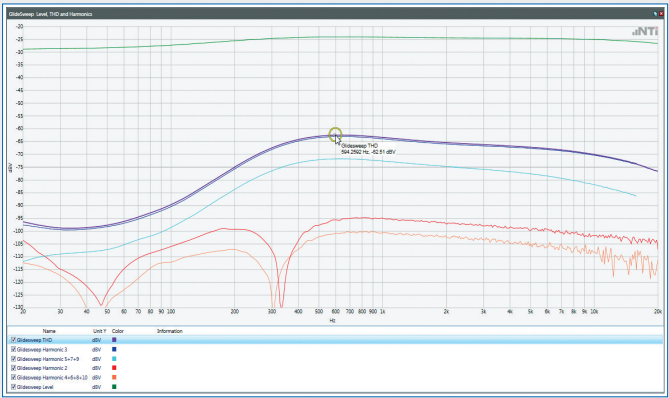
Do your test bench requirements often change? Perhaps you would like the test duration be shortened despite difficult environmental conditions? The FX100 Audio Analyzer is the ideal solution for your application thanks to its adaptability, measurement speed and reliability.

Superior Functionality

Do you want to check mobile phones, MP3 players or similar products that do not have an audio input? Take advantage of the FX100's unique ability to detect and analyze test signals played by an external playback device. In the setup, you simply transfer the test signal as WAV or MP3 file from the FX100 to the Device Under Test (DUT). The FX100 automatically detects the played signal and precisely measures the audio characteristics of the DUT.

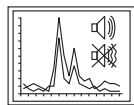
Numerous Applications

Configure the test signal with individual levels and frequencies. Monitor the level, harmonic distortion, and phase response, or use the high-resolution FFT spectrum to detail the behavior of the DUT. Use different sweep measurement methods to analyze the behavior of the DUT by frequency and amplitude.

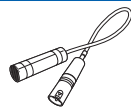


GlideSweep with Level and Distortion Analysis

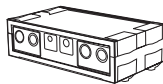
MODULE AND ACCESSORIES



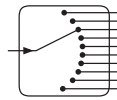
PureSound™
Rub & Buzz
830 000 200



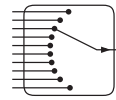
Measurement Mic.
M2010: # 600 040 010
M2015: # 600 040 015



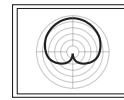
Bluetooth Box
600 061 021



OS-0210
Output Switcher
600 010 430



IS-1002
Input Switcher
600 010 425



Turntable TT01
600 061 020



Digital MEMS Mic
Interface
600 090 000

User-Friendly

Simply Better

The Windows-based FX-Control software not only allows unrestricted control of the meter, but also offers several helpful additional functions. Freely-configurable graphs show the detailed measurement results, while the test parameters and measurement functions are defined via separate input fields. This outstanding ease-of-use and flexibility make it easy to set up and execute even complex measurement sequences.

Versatile

The FX-Control software offers you a special advantage in that you can extend the standard measurements with customer-specific requirements. Mathematical functions can be applied to measurement results and results can be linked together. You can analyze selected data according to your own needs, link independent results, automatically derive tolerance limits and much more.



FX-Control: Customer-specific measurement configuration

Loudspeaker Test System

Acoustic Quality Control

The FX100 Loudspeaker Test System with the RT-Speaker software is designed for quality testing of active and passive loudspeakers. It supports the analysis of frequency & impedance response, sound pressure level, resonance frequencies, Thiele/Small parameters, etc. In addition, the system supports the NTi Audio PureSound™ option for detecting audible defects as well as statistical analysis such as trend analysis, histograms and Cpk/Ppk process control.

Simple Operation

A big advantage is the practical and clearly-understandable software structure. It leads the user intuitively through the parameterization process. The software strictly separates administrator and user roles thus allowing access to necessary functions only, e.g. users on the production line may be able to run but not configure tests.

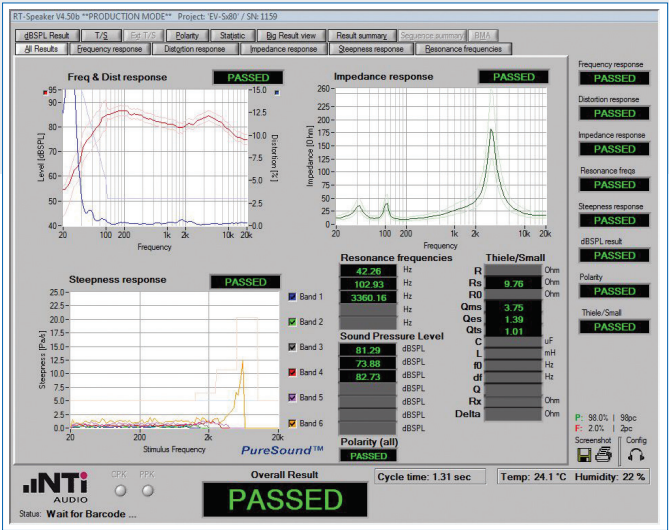
The Right Solution for You

The RT-Speaker software is available in three editions. This covers all loudspeaker testing environments; from manual processes to fully automated.

Smooth Setup of Pass/Fail Criteria

Before a new product goes into production, Pass/Fail criteria must be defined. The FX100 + RT-Speaker Speaker Test System facilitates this process considerably. A special mode for recording the reference data (golden sample) simplifies the rapid identification of clearly intact and defective parts and of borderline matches. The desired Pass/Fail criteria can thus be quickly and reliably established.

Speaker Test Software

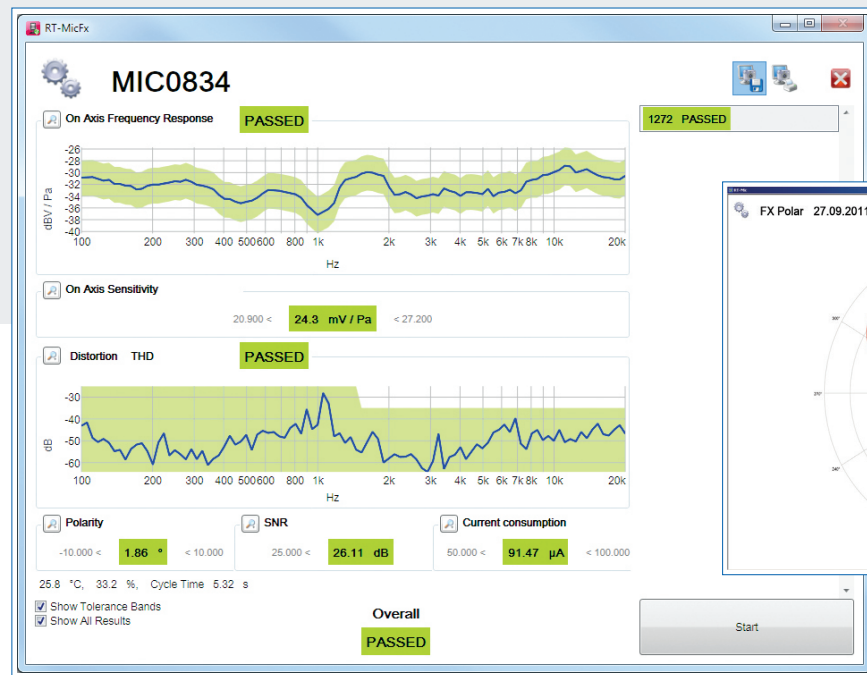


Microphone Test System

Wide Range of Applications

The FX100 Audio Analyzer, in conjunction with the RT-MicFX software, is ideal for the complete quality inspection of microphones. These include capsules (electret, condenser or dynamic), analog or digital MEMS microphones, and A2B™ microphones as well as complete products such as studio microphones, headsets or even mobile phones. The system captures frequency response, distortion (THD), linearity, sensitivity, and signal-to-noise ratio (SNR) within a very short time.

Microphone Measurement



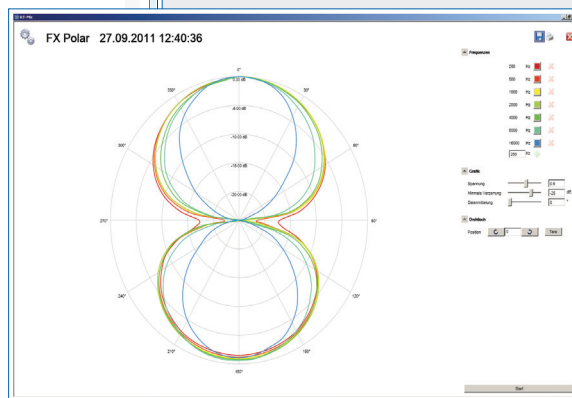
Polar Plot

In combination with the optional turntable, the system can determine the directional characteristic of microphones through the recording of their polar plots.

Other Options

If required, the system can be expanded with an ampere meter or ambient sensors, to capture additional parameters such as the microphone power consumption, ambient temperature, altitude and barometric pressure.

Polar Plot



Microphone Test Software

Measurement Microphones

M2230 / M2211 / M2215

M4261



Microphones for the XL2 Analyzer

Our various measurement microphone models are optimized for specific applications, are 48 V phantom powered, and include an electronic data sheet. When attaching the microphone, the XL2 automatically reads this data sheet, and recognizes the microphone model, sensitivity, and calibration data. This ensures accurate measurement results.

MODEL	DESCRIPTION
M2230	Class 1 measurement microphone with metal diaphragm for measurements according to the IEC 61672 standard (type-approved with the XL2-TA)
M2230-WP	Class 1 Outdoor measurement microphone, consists of the M2230 Microphone and WP30 Weather Protection (type-approved)
M2211	General purpose measurement microphone with metal diaphragm and Class 1 frequency response
M2215	Measurement microphone with metal diaphragm for high acoustic levels (up to 153 dB) and Class 1 frequency response
M4261	Cost-effective Class 2 measurement microphone for general sound level testing, commissioning and service of audio-acoustic installations.

Microphones for the FX100 Analyzer

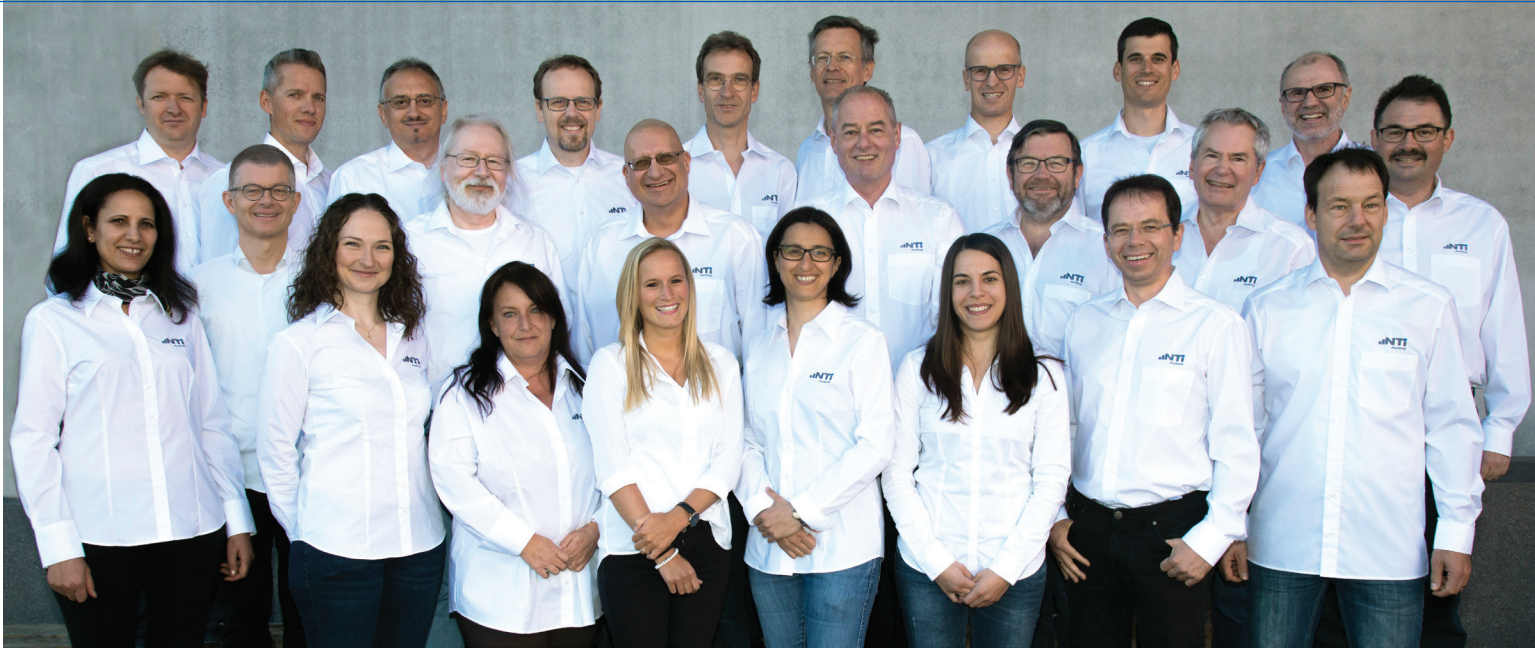
The M2010 and M2015 are high-performance measurement microphones dedicated to research, design lab, end-of-line testing and service. They are particularly suited for applications with restricted available space.

MODEL	DESCRIPTION
M2010	Extended performance microphone, with metal diaphragm
M2015	For high acoustic levels (155 dB), with metal diaphragm

M2010 / M2015



About NTi Audio



NTi Audio AG was founded in 2000 by a group of dedicated engineers, with the aim of providing precise test and measurement solutions at attractive prices. We are driven by the desire for innovative products and strive for maximum customer satisfaction. Today, we are a leading global manufacturer of measurement instruments and solutions for the audio, acoustics and vibration industries.

Our subsidiaries are located in Germany, Great Britain, USA, China, Japan and Korea. The head office is in Liechtenstein. In addition, NTi Audio maintains a network of sales and service partners in more than 70 countries around the world.

NTi Audio has been an ISO 9001 certified company since 2009.



CALIBRATION SERVICE

The NTi Audio calibration services provide documented and traceable verification that your NTi Audio instrument meets the published specifications. Annual calibration and adjustment cycles ensure the highest accuracy and follow the requirements of the EN ISO/IEC 17025 standards. The calibrating instruments used are traceable to a national standard. Detailed service guidelines are listed at www.nti-audio.com/service.



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



All information is subject to change without notice.

XL2, M2230, M2211, M2215, M4261, NoiseScout, Minirator MR-PRO, MR2, TalkBox, Digirator DR2, Digilyzer DL1, Flexus, FX100, RT-Speaker, RT-MicFX, PureSound, FX-Control Software, Data Explorer, Sound Insulation Reporter and Room Acoustics Reporter are trademarks of **NTi Audio AG**.

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