Audio & Acoustic

Test & Measurement Solutions

Made in
Switzerland
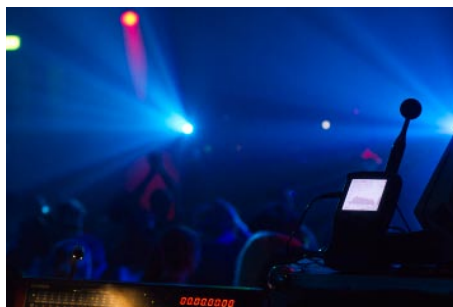
MINIRATOR MR-PRO / MR2

Analog Audio Generator and Impedance Meter

Sine, Sweeps, Noise

User Wav-files

Impedance Meter

Cable Tester

+18 dBu Max. Output

THD+N < -96 dB

The Minirator MR-PRO is a powerful analog audio generator for the professional engineer, providing a wide range of test signals like sine, pink noise, white noise, polarity, delay, chirp and sweep. Further, a set of wav-files, useful for system optimization, is stored in the internal flash memory. You may add your own personal favorites to this set.

The signal balance, phantom power and impedance of the connected load is monitored. Together with the integrated XLR cable tester, this simplifies troubleshooting.

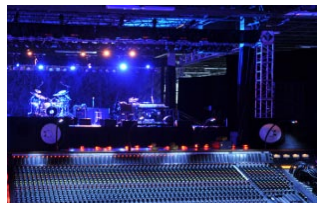The Minirator MR2 is the smaller version of the MR-PRO with reduced functionality.

www.nti-audio.com/MRPRO
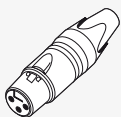
Applications

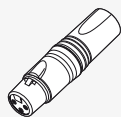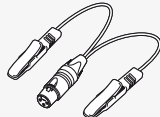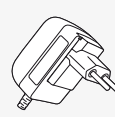| Installed Sound | Live Sound | Building Acoustics | Broadcast & Studio |

Accessories

| Remote Cable Test Plug (MR-PRO) # 600 000 311 | Minirator -40dB Adapter # 600 000 312 | MR-PRO 70V/100V Protective Adapter # 600 000 313 | Mains Power Adapter International # 600 000 333 Americas # 600 000 301 | Ever-ready Pouch # 600 000 302 | Calibration Certificate # 600 000 018 |

NTI AUDIO TALKBOX

Acoustic Generator (STIPA Reference)

The TalkBox is an acoustic signal generator for speech intelligibility measurements in evacuation and announcement systems, as well as for level alignment of teleconference or other audio systems. It allows you to perform a complete end-to-end evaluation of the speech intelligibility STI from the talker's microphone to the listener's ears.

The TalkBox simulates a human talker (60 dBA @ 1 meter according to IEC 60268-16) with the STIPA test signal and spoken messages. Further it provides a wide range of test signals like sine, pink noise, white noise and delay.

STIPA Reference

System Line-up

Excellent Flatness

Calibrated Output Level

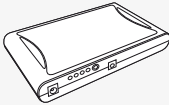www.nti-audio.com/TalkBox

Applications

Installed Sound

Telepresence Systems

Accessories

Battery Pack
600 000 086

Calibration Certificate
600 000 018

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

XL2

Sound Level Meter - Audio and Acoustic Analyzer

The hand-held XL2 Analyzer is a powerful Sound Level Meter, a professional Acoustic Analyzer and a precision Audio Analyzer in one instrument. Easy operation and countless applications distinguish this quality Swiss product.

Switch on - Good to go

Get the job done, on time! The instrument is ready to measure literally seconds after you press the power button. The intuitive navigation and flexible user interface assist in simplifying every task. The XL2 provides an extensive range of measurement functions.

Ready for any Challenge

The XL2 is developed according to user needs, and provides reliable measurement solutions for sound system installations, noise control, architectural acoustics, evacuation systems, live events, quality inspection and occupational health and safety. Discover an instrument you can trust for specialist applications.

www.nti-audio.com/XL2

Picture:
XL2 Analyzer with M2211 Measurement Microphone

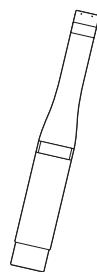## Applications

Community Noise

Installed Sound

Industrial

Live Sound

Measurement Microphones

A range of measurement microphones are available to suit your requirements. The microphones include an electronic data sheet from which the ASD (Automatic Sensor Detection) of the XL2 recognizes the sensitivity and calibration data of the connected microphone. This promotes faster setup and ensures accurate measurements.

Recommended microphones for the following applications:

M2230	Certified class 1 according to IEC 61672, with metal diaphragm
M2230-WP	Outdoor microphone (consists of M2230 and WP30 Weather Kit)
M2211	General purpose measurement microphone, with metal diaphragm
M2215	For high acoustic levels (153 dB), with metal diaphragm
M4260	Cost-effective class 2 microphone for general sound level testing, commissioning and service

Options

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

- **Speech Intelligibility STIPA**
  Measures STIPA of public announcement and evacuation systems according to the IEC 60628-16 standard.

- **Extended Acoustic Pack**
  For acoustic consultants. Offers percentiles, linear wav-file and event recording, 1/3 octave RT60 and Zoom-FFT.

- **Spectral Limits Option**
  Includes 1/12th octave resolution, trace capturing, spectral limits definition and passed/failed visualization.

- **Cinema Meter**
  For efficient calibration and repetitive verification of cinema loudspeaker systems utilizing assistant guides.

- **Remote Measurement Option**
  Allows you to pull the live XL2 measurement data into a PC application via USB. Download free templates for evaluation.

- **Data Explorer Option**
  PC-based software application with a powerful data processor for fast analysis of sound level measurement data.

Accessories

XL2 Projector PC Application free download	ASD Cable 5m, 10m, 20m # 600 000 336/64/65	Precision Calibrator # 600 000 388	Mains Power Adapter International # 600 000 333 Americas # 600 000 301	Battery Charger # 600 000 332	Input Keypad # 600 000 384

89.4 dBA
85.3 dBLeq

Ever-ready Pouch # 600 000 335	Exel Case # 600 000 334	XL2 Limit Light # 600 000 600	Stack Light # 600 000 610	NetBox with Modem # 600 000 458	Calibration Certificate # 600 000 018

Calibration Certificate

XL2 DATA EXPLORER

The easy way to analyze logged sound level data

- Data visualization
- Fast zoom and pan
- Audio playback
- Markers calculation
- Customized reporting

The XL2 Data Explorer is a PC-based software application with a powerful data processor for easy and fast analysis of sound level measurement data. Visualize, analyze and control millions of data points with this tool that is dedicated to acoustic consultants and noise measurement professionals. It provides a convenient way to manage your data and quickly create customized reports.
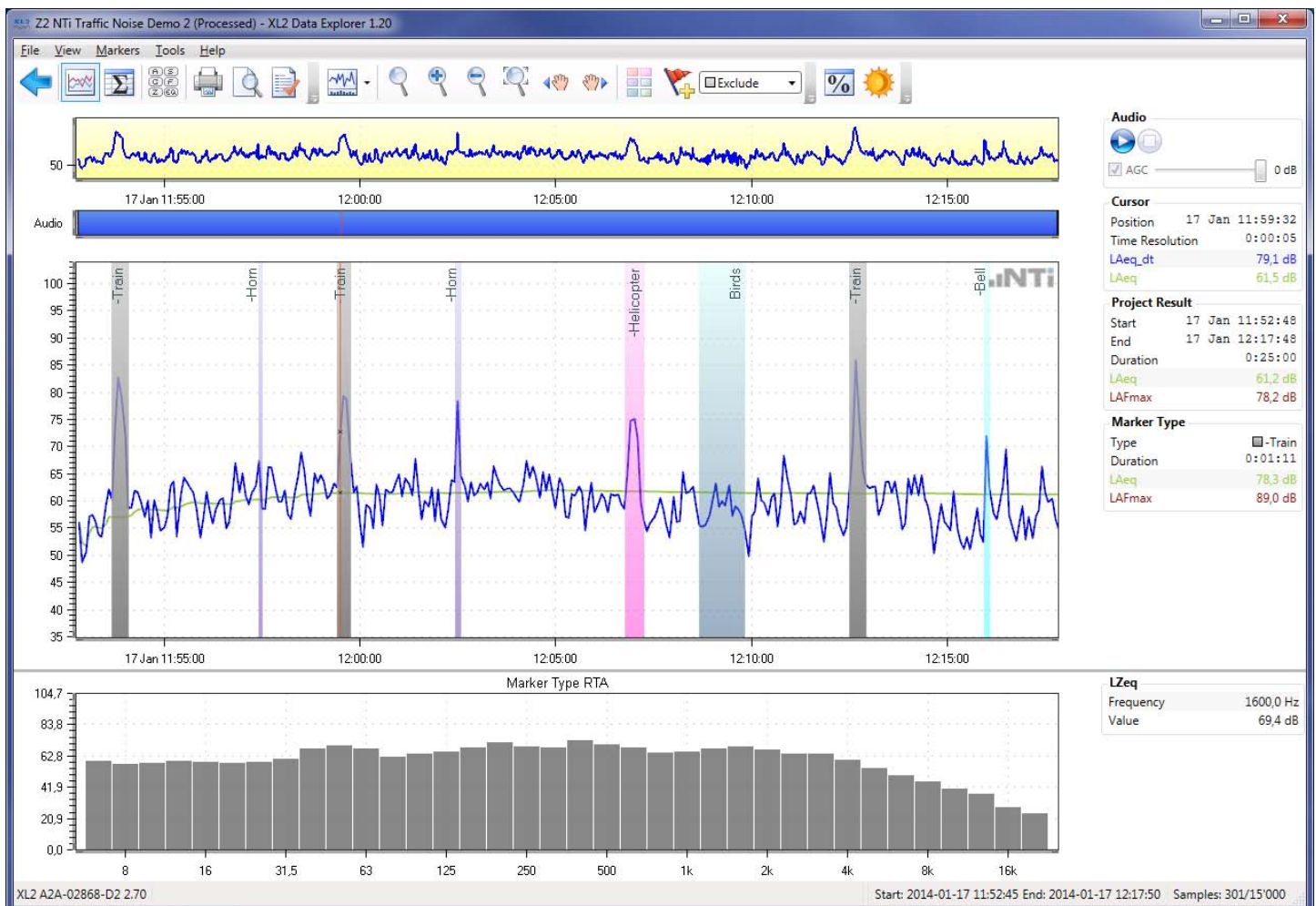
ENVIRONMENTAL NOISE MONITORING

Unattended Noise Monitoring Station

A tailored solution for outdoor noise monitoring is available for the XL2 Sound Level Meter. The outdoor measurement microphone M2230-WP and the heavy-duty outdoor case ideally complement the XL2 system for unattended noise monitoring.
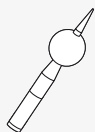
Outdoor Microphone

M2230-WP is a weather-protected microphone solution for the XL2 Sound Level Meter allowing acquisition of environmental noise data in outdoor applications. The corrosion-free polymer housing, wind screen and water-repellent membrane protect the microphone capsule. The outdoor microphone M2230-WP fulfills IEC 61672 Class 1 as well as the ANSI S1.4 Type 1 requirements. The upper section of the weather protection kit is snap-on mounted and can thus be easily removed by hand for convenient and quick calibration of the measurement microphone.

Outdoor Case

The outdoor case delivers a professional solution for unattended noise monitoring. It protects the XL2 Sound Level Meter from severe weather conditions and offers generous space for batteries and further accessories. The connection cable to the outdoor microphone runs into the case through a rain-protected aperture.
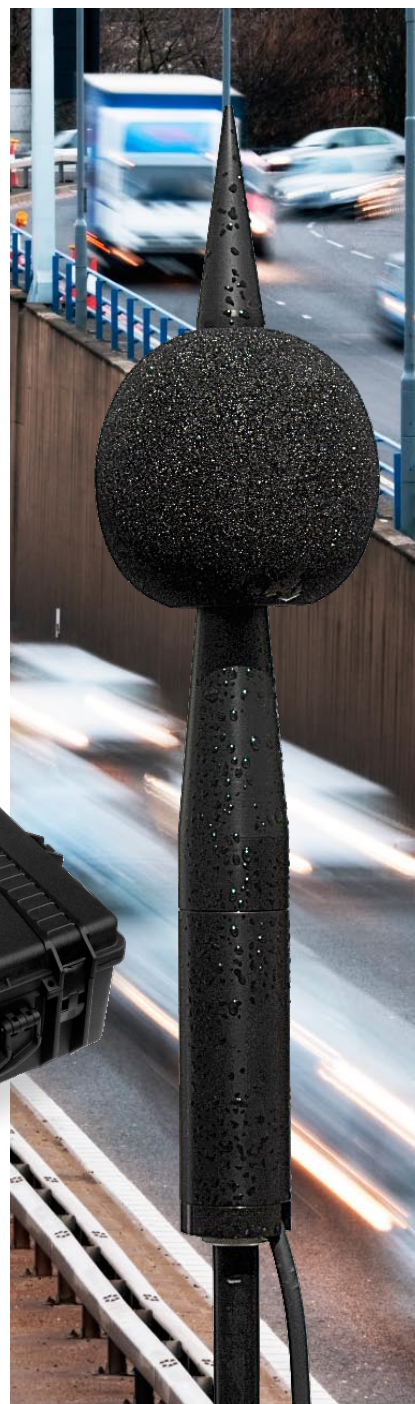
Accessories

Outdoor Microphone M2230-WP	Heavy Duty Outdoor Case	Basic Outdoor Case
# 600 040 055	# 600 000 470	# 600 000 471

DIGIRATOR DR2
Digital Audio Signal Generator

- Up to 192 kHz / 24 Bit
- AES3, S/PDIF, TOSLINK & ADAT
- Multi-Format Sync Input
- Dolby & DTS Signals

- Channel Transparency Check
- Channel Delay Measurement

The Digirator DR2 is a reference-grade digital audio signal generator with transformer-balanced AES3, S/PDIF, TOSLINK and ADAT outputs. The generator offers a wide range of test signals like sine, pink noise, white noise, polarity, delay, chirp and sweep. Further, it offers a set of surround-sound test sequences for the verification and adjustment of professional digital environments including Dolby Digital, Dolby E and DTS installations.

The internal low-jitter clock generator can be synchronized to AES3, DARS, Word Clock and Video signals. Measurement of channel transparency, channel propagation delay and sample frequency is supported.
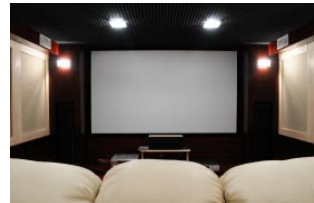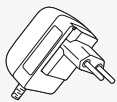
www.nti-audio.com/DR2

Applications

Broadcast & Studio
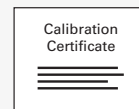
Installed Sound

Cinema

Accessories

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

Ever-ready Pouch
600 000 302

System Case
600 000 020

Calibration Certificate
600 000 018

DIGILYZER DL1
Digital Audio Analyzer

The Digilyzer DL1 is a powerful digital audio analyzer. Testing, monitoring and troubleshooting digital audio interfaces is straightforward using this compact tool. The digital audio formats AES3, S/PDIF, TOSLINK and ADAT with sampling frequencies up to 96 kHz are supported.

Digital audio becomes transparent and easy to debug with the unique integrity check, the integrated speaker, event logging and the audio lens.

www.nti-audio.com/DL1

Digital Audio Monitoring

Channel Status Analysis

Carrier Measurements

Up to 96 kHz / 24 Bit

AES3, S/PDIF
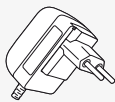
TOSLINK & ADAT

Applications

Broadcast & Studio

Installed Sound

Accessories

| MiniLINK PC Interface # 600 000 033 | EU Mains Adapter # 600 000 210 | Soft Pouch # 600 000 012 | System Case # 600 000 020 | Calibration Certificate # 600 000 018 |

Real Time Analyzer

Reverberation Time RT60

Speech Intelligibility STIPA

Zoom FFT, Delay, THD+N, ...

ACOUSTILYZER AL1
Acoustic Analyzer

The Acoustilyzer is the predecessor of the XL2 Audio and Acoustic Analyzer. It is a handheld sound level meter and acoustic analyzer for measuring and monitoring sound pressure level, room acoustics and, optionally, speech intelligibility STIPA. Additionally it offers basic audio measurements. These acoustic and audio functions make the Acoustilyzer AL1 the ideal tool for measurement applications in Installations, Live Sound, Studio and Broadcast.

Options

- **ML1 - AL1 Crossgrade**
  enables all Minilyzer ML1 functions
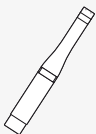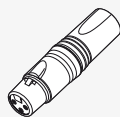- **STIPA Speech Intelligibility**

www.nti-audio.com/AL1

Acoustilyzer AL1 with
MiniSPL Microphone

Applications
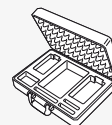
Installed Sound

Live Sound

Accessories

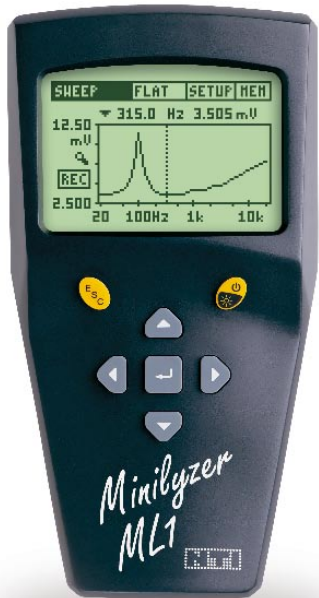| MiniSPL Measurement Mic # 600 000 022 | Adapter - 20dB # 600 000 014 | Soft Pouch # 600 000 012 | System Case # 600 000 020 | Calibration Certificate # 600 000 018 |

MINILYZER ML1

Audio Analyzer

The Minilyzer ML1 is a handheld analyzer dedicated to analog audio measurements with elemental sound level functions. The Minilyzer ML1 simplifies the process of system verification, diagnostics and repairs to audio installations. The user interface aids operators of all skill levels by automatically setting all ranges and providing complete results on a single screen.

Options

- **ML1 - AL1 Crossgrade**
  enables all Acoustilyzer AL1 functions

- **STIPA Speech Intelligibility**
- **AFILS Measurements**
  included with MiniLINK PC Interface

www.nti-audio.com/ML1

Level: RMS, Rel, SPL, Leq

THD+N, 2nd to 5th Harmonics

Frequency and Time Sweeps

Scope, vu+PPM, Polarity

Balanced & Unbalanced Input

High Accuracy (+/- 0.1dB)
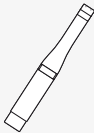
Applications

Installed Sound

Live Sound

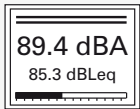

Research & Development
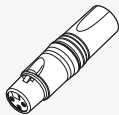
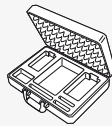## Accessories

| MiniSPL Measurement Mic # 600 000 022 | MiniLINK PC Interface # 600 000 033 | Adapter - 20dB # 600 000 014 | Soft Pouch # 600 000 012 | System Case # 600 000 020 | Calibration Certificate # 600 000 018 |

FLEXUS FX100

Adaptive Analog and Digital Audio Analyzer

- Simplest Test Setup
- Fastest Measurements
- Swiss Precision
- Easy Operation
- No Recurring Costs

The FX100 is the first professional audio analyzer that adapts to your application, and not inversely. The instrument offers comprehensive measurements including Passed/Failed tests in under 1 second. You may customize the system for two or four parallel channel operation, speaker impedance testing and digital audio measurements. Switcher modules provide additional outputs and inputs.

Applications

R & D

www.nti-audio.com/FX100

Acoustics

Transducer Testing

Manufacturing

Service & Repair

FAST. PRECISE. RELIABLE.

Time is Money

In our fast changing world, speed is the key to success. Many test engineers are under high time pressure when implementing a new test procedure or verifying devices on a production line. The FX100 Analyzer offers the simplest system integration for the fastest testing of audio and acoustic devices. By its adaptive design, performance-optimized circuits and built-in calculation power, the instrument is the first choice when it comes to minimizing test setup and cycle times.

Intuitivity Redefined

Discover the ease of operation of an instrument with hundreds of functions. Thanks to its elaborate design, the FX-Control software for the FX100 Audio Analyzer is setting a new standard regarding the straightforward definition of measurements or test sequences.

First Class Service

For more than thirty years, our customers have been benefiting from competent, close-at-hand support. The six NTi Audio worldwide subsidiaries and their distribution partners offer a first class support network. In addition, NTi Audio has, since inception, provided firmware & software updates free of charge, because your FX100 deserves to be kept up-to-date.

Swiss Precision

Elaborate electronics, powerful on-board DSPs and sophisticated calculation algorithms ensure the fastest simultaneous measurements as well as customized tolerance limits for Passed/Failed checks in real-time.

Keep it Simple

A test system that can be tailored to changing needs allows you to avoid cumbersome installations or cable tangle. The modular concept of the FX100 Audio Analyzer is the perfect solution for this demand. By offering a wide range of carefully-designed plug-in modules, you may create exactly the configuration that covers your requirements and connects to your device under test with a minimum number of cables.

FX100 with Channel Extension and Speaker Impedance Module

Modular Extensions

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

THE DE-FACTO STANDARD IN ACOUSTIC QUALITY CONTROL

No Open Wishes

Are you facing frequently-changing measurement demands, or do you have to minimize the test time in a challenging environment? Then the FX100 Audio Analyzer is the best choice for your application, due to its flexibility, speed and reliability.

Unlimited Applications

Generate test signals with specific levels and/or frequencies. Continuously monitor the level and distortion, phase response of the device under test or acquire the high-resolution FFT spectrum with a block length of up to 2 MB. Take advantage of numerous StepSweep modes to evaluate the detailed behavior of your DUT. For instance, you may choose to measure the frequency response, linearity, THD vs. input level and other parameters by executing an amplitude, frequency, table or time sweep.

The All-In-One Solution

Regardless, whether you are in an R&D lab or in a production environment, in the analog or digital world or both, the FLEXUS system offers the features you need. Multi-channel devices, small transducers or large loudspeakers, acoustical coupling or A-A, A-D, D-A or D-D setups – just select the appropriate plug-in module to complement the FX100 Audio Analyzer for your test application.

Superior Functionality

Need to quickly test a mobile phone, mp3 player or a similar playback device without audio input connector? FX100 provides the answer, thanks to its unparalleled ability to trigger to and analyze GlideSweep signals originating from an external playback device. All you need to do is to simply export the test signal as a wav or mp3 file from the FX100 to the device. Then, using the device to play the signal, measure the audio characteristics of the device with the FX100.
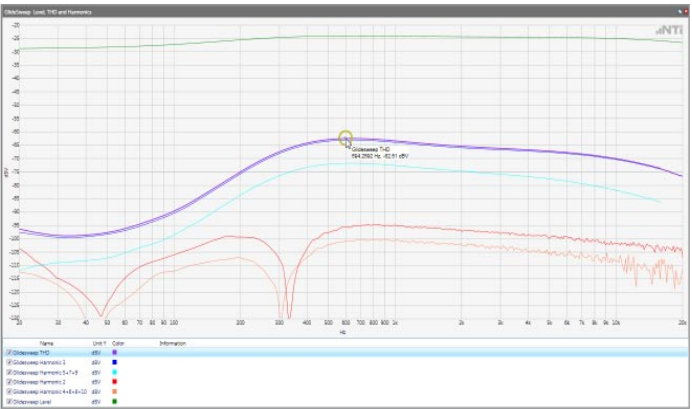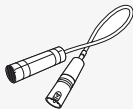

GlideSweep measurement with analysis of level, THD and harmonics
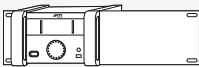
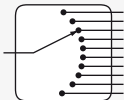## Options and Accessories
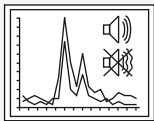
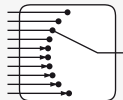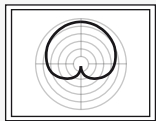| PureSound™ Defects Analysis # 830 000 220 | Meas. Microphones M2010: # 600 040 010 M2015: # 600 040 015 | FX100 Rack Mounting 1x FX100 # 600 061 005 2x FX100 # 600 061 006 | OS-0210 Output Switcher # 600 010 430 | IS-1002 Input Switcher # 600 010 425 | Turntable TT01 for lightweight devices # 600 061 020 |

INTUITIVITY REDEFINED

Keep It Simple

The Windows-based FX-Control software is provided with the FX100. It offers a comprehensive interface for robust control of the FX100 including many useful functions. Fully-configurable charts display the details of the measurement results. Test parameters and measurement functions can be defined in multiple windows. It is this outstanding ease-of-use and flexibility that makes even the most complex measurement processes quick and simple to manage.

Adaptive

A particular advantage of the FX-Control software is that you can extend the standard range of measurement functions by customized calculation items and regulators. For instance, arithmetic basic functions such as addition or multiplication, boolean operators, interpolation or smoothing etc. are supported. Thus, you may create separated analysis of selected portions of a trace, determine outcomes by linking several obtained results, automatically derive and dynamically adjust tolerance limits and much more.

Example of a customized measurement setup

THE LEADING LOUDSPEAKER TEST SYSTEM

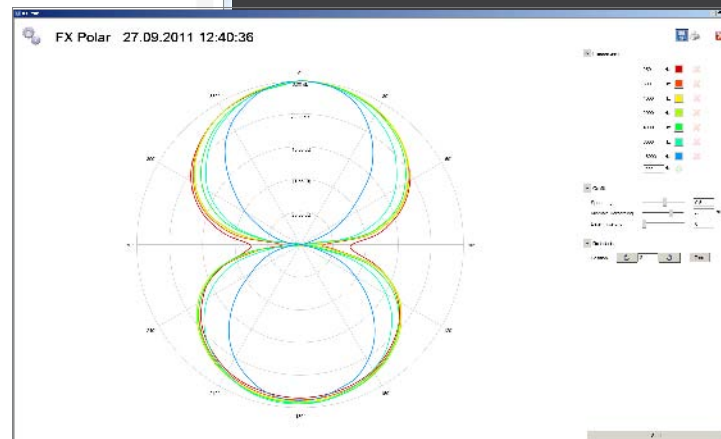RT-Speaker overview of the measurement results

Smooth Setup of Pass/Fail Criteria

As soon as a new product goes into production, the significance of the Pass/Fail criteria must be considered. This adjustment represents a major challenge because both the relevance of measurements as well as the level of the yield depends directly on optimizing these tolerance limits.

The FX100 + RT-Speaker test system facilitates this process considerably, thanks to its informative user interface and several practical functions. As examples, the concept of nested classes and the reference recording mode simplifies the rapid identification of clearly intact or defective parts as well as limit sample. The desired Pass/Fail criteria can thus be quickly and reliably established.

Acoustic Quality Control

Verifying electro-acoustic transducers in a harsh manufacturing environment requires a sensitive, yet rugged and fast test system. The FX100 Audio Analyzer with the PureSound™ option for detecting audible defects provides a trusted and proven solution. The system supports all kinds of acoustic measurements such as level, distortion, T/S parameters etc. 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 structure of the software. It leads the user intuitively through the parameterization process.

There is also a strict separation of administrator and user modes, allowing the user rights to be adjusted as the process becomes more familiar.

MICROPHONE TEST SYSTEM

Frequency response, sensitivity and distortion

Polar plot

Wide Range of Applications

The FX100 Analyzer + RT-MicFX software are excellent for comprehensive quality control of microphones, be they capsules (electret, condenser or dynamic), digital MEMS microphones or contained in complete products such as studio microphones, headsets or mobile phones.

The microphone test system captures frequency response, sensitivity and distortion (THD) in the shortest possible time.

Polar Diagrams

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

MEASUREMENT MICROPHONES

Microphones for the XL2 Analyzer

Choose the microphone that fits your requirements from the table below. All microphones are 48V phantom powered and include an electronic data sheet. The Automated Sensor Detection (ASD) of the XL2 Analyzer automatically reads this data sheet, and recognizes the microphone model, sensitivity and calibration data. This ensures accurate measurement results.

High Dynamic Range

Flat Freq. Response

48V Phantom Powered

Electronic Data Sheet

M4260

M2230
M2211
M2215

Type	Description
M2230	Certified class 1 measurement microphone according to IEC 61672 with metal diaphragm
M2230-WP	Class 1 outdoor measurement microphone (consists of M2230 and WP30 Weather Protection)
M2211	General purpose microphone, with class 1 frequency response and metal diaphragm
M2215	For high acoustic levels (153 dB), with class 1 frequency response and metal diaphragm
M4260	Cost-effective class 2 measurement microphone for general sound level testing, commissioning and service of audio-acoustic installations.
MA220	1/2" microphone preamplifier without capsule

Microphones for the FX100 Analyzer

The M2010 and M2015 are compact, 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.

High Dynamic Range

Flat Freq. Response

48V Phantom Powered

Compact Design

Detachable Cable

M2010
M2015

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

www.nti-audio.com/mic

WORLDWIDE SERVICE

Our mission is to provide quality and affordable audio measurement devices. We are proud to offer you innovative and practical solutions.

NTi Audio maintains a network with sales and service partners in more than 70 countries around the globe. The strategic arrangement of six NTi Audio offices spread over all time zones guarantees prompt response to your inquiries as well as short distances for your worldwide after sales service.

CALIBRATION SERVICE

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

ABOUT NTI AUDIO

NTi Audio AG develops and manufactures professional audio and acoustic measurement solutions with a know-how heritage of more than 40 years. The headquarters are located in the Principality of Liechtenstein (Europe). Subsidiaries are located in Portland (US), London (UK), Suzhou (China), Tokyo (Japan), Seoul (Korea), Prague (Czech) and in Essen (Germany).

NTi Audio AG is an ISO 9001 certified company.

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www.nti-audio.com

Made in
Switzerland

dth 5000 - 10.15