

OPERATING MANUAL

MEASUREMENT MICROPHONES

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NTi Audio is an ISO 9001:2008 certified company.

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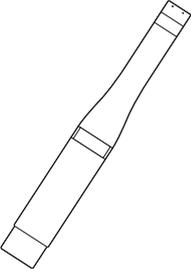
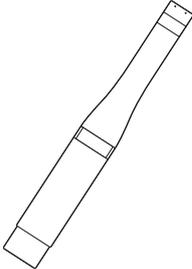
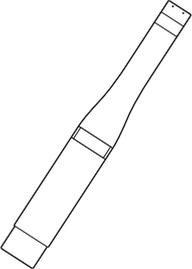
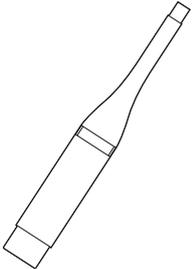
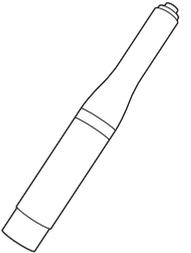
Made in
Switzerland



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Overview Measurement Microphones

M2230	M2211, M2210	M2215	M4260	MA220 PreAmplifier
				
<p>Certified Class 1 measurement microphone according to IEC 61672. Metal diaphragm.</p>	<p>General purpose microphone. Class 1 frequency response. Metal diaphragm.</p>	<p>For high sound levels (up to 153 dB). Class 1 frequency response. Metal diaphragm.</p>	<p>Cost-effective class 2 measurement microphone for general sound level testing, commissioning and service of audio-acoustic installations.</p>	<p>Microphone preamplifier compatible with 1/2" pre-polarized capsules.</p>

Scope of Delivery

M2230	<ul style="list-style-type: none"> • Measurement Microphone • Dust Cap • 50 mm Windscreen • Microphone-holder MH01 with Adapter 5/8" - 3/8" • Operating Manual • Individual Frequency Response Chart
M2211 M2210 M2215 M4260	<ul style="list-style-type: none"> • Measurement Microphone • Dust Cap • 33 mm Windscreen • Microphone-holder MH01 with Adapter 5/8" - 3/8" • Operating Manual
MA220	<ul style="list-style-type: none"> • PreAmplifier • Dust Cap • Microphone-holder MH01 with Adapter 5/8" - 3/8" • Operating Manual

Notes



- Use the microphone for the intended purpose only.
- Protect the microphone from contamination by always using the supplied windscreen.
- Never use the microphone in a damp or wet environment.
- Do not jar or drop the microphone.
- Do not remove the microphone protective grid.
- Do not touch the microphone membrane.
- Remove the black dust cap of the 1/2" measurement microphones prior to use.

Description

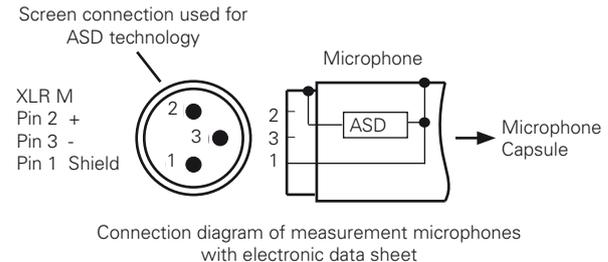
The plug-on measurement microphones combined with the XL2 Analyzer form a comprehensive sound level meter and acoustic analyzer. The microphones are 48 VDC phantom-powered and include an electronic data sheet.

Integrated Preamplifier

The microphone bodies contain a preamplifier and require 48 VDC phantom power supply for operation. They combine high dynamic range and wide frequency range with low noise. The measurement microphones can also be connected with an ASD Cable to the XL2 Audio and Acoustic Analyzer for measurements at remote locations or for reduction of acoustic reflections.

Electronic Data Sheet

The microphones include an electronic data sheet. The Automated Sensor Detection (ASD) of the XL2 Analyzer automatically reads this data, i.e. the microphone model and calibration data. This promotes faster setup and ensures accurate measurements.



Connecting to XL2

Microphone plugs directly into the XL2

The XL2 automatically reads the electronic data sheet of the connected microphone as follows:

- Connect the measurement microphone to the XL2.
- Switch on the XL2.

 The XL2 reads the electronic data sheet of the connected microphone during a brief initialization process prior to the first measurement.

Microphone Connection via the ASD Cable

The NTi Audio measurement microphones can be connected with an ASD Cable to the XL2 Analyzer for measurements at remote locations or for reducing acoustic reflections. The electronic data sheet is transmitted via the XLR connector's housing. Do not touch this during the brief initialization period to ensure the complete data sheet is recognized by the XL2. The automated sensor detection does not disturb any measurements. You may join up to 4x ASD Cables together in series. The ASD technology supports accurate data communication up to a combined cable length of 20 meters (= 65 feet).

Microphone Connection via a professional Audio Cable

For distances longer than 20 meter (= 65 feet) use a high quality, low capacitance standard professional audio cable. The microphone sensitivity has to be entered manually into the XL2 Analyzer.

Alternatively connect the microphone first directly to the Analyzer. The XL2 reads the sensitivity and remembers this value. Afterwards connect the audio cable.

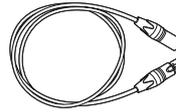
Accessories



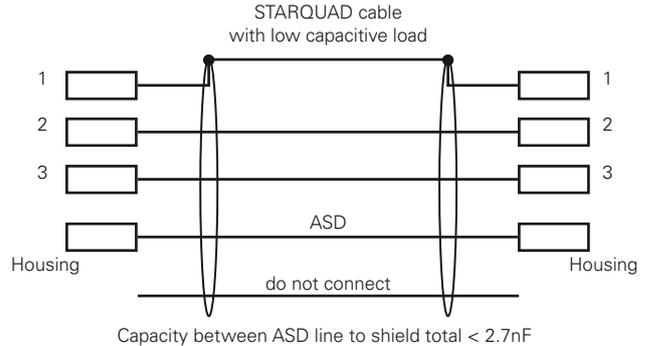
Precision Calibrator 94/114 dB, Class 1
The precision calibrator is used to ensure accurate sound level measurements. It generates 94 or 114 dB SPL reference tones @ 1kHz for calibration of 1/2" and 1/4" measurement microphones.
NTi Audio #: 600 000 390



Manufacturer Calibration Certificate
The calibration certificate lists the individual product data with serial number. The calibration and adjustment procedures follow the documentation and traceability requirements of the EN ISO / IEC 17025 standard. Annual re-calibration of the instrument is recommended ensuring accurate measurements.
NTi Audio # 600 000 018



ASD Cable
The ASD Cable allows for extended connections of the NTi Audio measurement microphones. It supports the transfer of the electronic data sheet from the microphone to the XL2 Analyzer. You may chain up to 4x ASD Cables together in tandem.
Length = 5 meter (16 feet)
NTi Audio #: 600 000 336



Further Information

My NTi Audio

Register your instruments at My NTi Audio and benefit from the following possibilities:

- Free updates for your instruments
- Activation of optional product functions
- Premium access to downloads
- Receive application and product news
- Faster worldwide support
- Tracing support in case of loss or theft
- Calibration support

How to Register

- Open the web page “<http://my.nti-audio.com>”
- You are prompted to login or create your My NTi Audio account.
- The web page “My NTi Audio Products” opens.
- Select the product type and enter the serial number.
- Confirm with “Register”.
- Now your product is listed in the table “My Products”.

 Congratulations, your NTi Audio product is registered.

Warranty Conditions

International warranty

NTi Audio guarantees the function of its products and the individual components for a period of one year from the date of sale. During this period, defective products will either be repaired free of charge or replaced.

Limitations

These guarantee provisions do not cover damage caused by accidents, transportation, incorrect use, carelessness, non-original accessories, the loss of parts, operation with non-specified input voltages, adapter types or incorrectly inserted batteries. NTi Audio accepts no responsibility for subsequent damage of any kind. The warranty will be voided by carrying out repairs or services by third parties who are not part of an approved NTi Audio Service Centre.

Statutory Rights

Consumers may have legal (statutory) rights under applicable national laws relating to the sale of consumer products. This warranty does not affect your statutory rights. You may assert any legal rights you have at your sole discretion.

Calibration Certificate

The NTi Audio measurement microphones have been carefully tested during production and corresponds to the specifications listed in "Technical Data". Calibration certificates for new products are optional.

NTi Audio recommends annual calibration of the products after the purchase. The calibration provides documented and traceable measurement accuracy and confirms that your NTi Audio product meets or exceeds the published specifications. The calibration and adjustment procedures follow the documentation and traceability requirements of the standard EN ISO / IEC 17025.

For calibrations kindly follow the service guidelines at www.nti-audio.com/service.

Service and Repairs

If your product is not functioning correctly or is damaged, please contact the local NTi Audio partner for assistance. If the product needs to be returned for service, kindly follow the service guidelines at www.nti-audio.com/service.

Declaration of Conformity

CE / FCC Compliance Statement

We, the manufacturer

NTi Audio AG
Im alten Riet 102
9494 Schaan
Liechtenstein, Europe



do hereby declare that the measurement microphones M2230, M2211, M2215, M4260, the preamplifier MA220 and accessories, comply with the following standards or other standard documents:

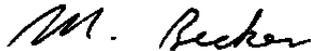
EMC: 89/336, 92/31, 93/68

Harmonized standards: EN 61326-1

This declaration will become invalid if modifications to the instrument are carried out without the written approval of NTi Audio.

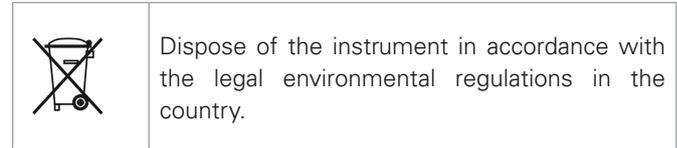
Date: 1. February 2013

Signature:



Position: Technical Director

Information for Disposal and Recycling



Regulations for the EU and other European countries with corresponding laws

The instrument must not be disposed of in the household garbage. At the end of its service life, bring the instrument to a collecting point for electrical recycling in accordance with the local legal regulations.

Other countries outside the EU

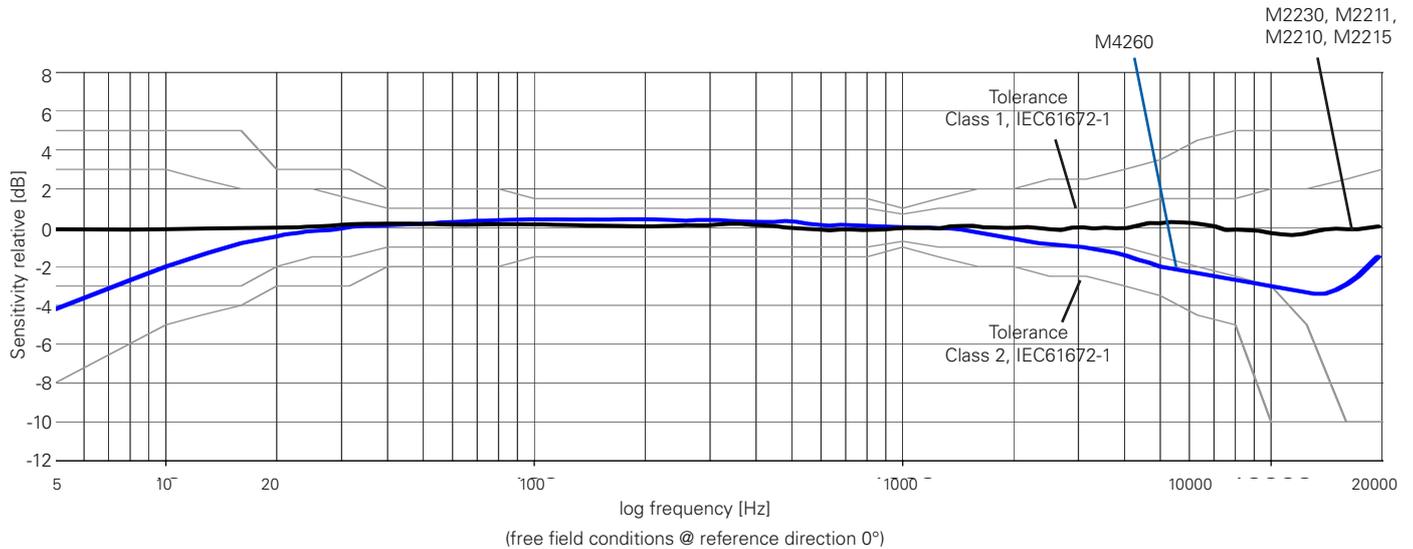
Contact the respective authorities for the valid environmental regulations in the country.

Technical Data Measurement Microphones

	M2230 Class 1 Certified	M2211, M2210 Frequency Response Class 1	M2215 High SPL Frequency Response Class 1	M4260 Class 2
Microphone Type	Omnidirectional, pre-polarized condenser, free field microphone			
Capsule / Transducer	1/2" detachable with 60UNS2 thread			1/4" permanently installed
PreAmplifier Type	MA220			-
Flatness	Class 1 (IEC61672-1) ±1 dB @ 5 Hz - 20 Hz ±1 dB @ 20 Hz - 4 kHz ±2 dB @ 4 kHz - 20 kHz			Class 2 (IEC61672-1) +1/-4.5 dB @ 5 Hz - 20 Hz ±1.5 dB @ 20 Hz - 4 kHz ±4.5 dB @ 4 kHz - 20 kHz
Frequency Range	5 Hz - 20 kHz			
Residual Noise Floor typical	16 dB(A)	M2211: 21 dB(A) M2210: 19 dB(A)	29 dB(A)	29 dB(A)
Maximum SPL @THD 3%, 1 kHz	139 dB SPL	144 dB SPL	153 dB SPL	144 dB SPL
Sensitivity typical @ 1 kHz	-27.5 dBV/Pa ±2 dB (42 mV/Pa)	-34 dBV/Pa ±3 dB (20 mV/Pa)	-42 dBV/Pa ±3 dB (8 mV/Pa)	-31.7 dBV/Pa ±3 dB (26 mV/Pa)
Temperature Coefficient	< -0.01 dB / °C	< ±0.015 dB / °C		< ±0.02 dB / °C
Temperature Range	-10°C to +50°C (14°F to 122°F)			0°C to +40°C (32°F to 104°F)
Pressure Coefficient	-0.005 dB / kPa	-0.02 dB / kPa		-0.04 dB / kPa

	M2230 Class 1 Certified	M2211, M2210 Frequency Response Class 1	M2215 High SPL Frequency Response Class 1	M4260 Class 2
Influence of Humidity (non-condensing)	< ±0.05 dB			< ±0.4 dB
Humidity	5% to 90% RH, non-condensing			
Long Term Stability	> 250 years / dB			-
Electronic Data Sheet	NTi Audio ASD in accordance with IEEE P1451.4 V1.0, Class 2, Template 27			
Output Impedance	100 Ohm balanced			
Power Supply	48 VDC phantom power, 3 mA typical			
Connector	Balanced 3-pole XLR			
Diameter Dimensions	20.5 mm (0.8")			
Length Dimensions	154 mm (6.1")	150 mm (5.9")		
Weight	100 g, 3.53 oz			83 g, 2.93 oz
NTi Audio #	600 040 050	600 040 022	600 040 045	600 040 025

Typical Frequency Response



Technical Data PreAmplifier

	MA220 PreAmplifier
Microphone PreAmplifier	Compatible with standardized 1/2" microphone capsules
Frequency Range	4 Hz - 100 kHz
Residual Noise Floor typical	1.6uV(A) at C_in 18pF \pm 12 dBA @ 20 mV/Pa
Frequency Response Flatness	\pm 0.2 dB
Phase Linearity	< 1° @ 20 Hz - 20 kHz
Maximum Output Voltage	21 Vpp \pm 7.4 Vrms \pm 145 dBSPL @ 20 mV/Pa, THD 3%, 1 kHz
Electronic Data Sheet	<ul style="list-style-type: none"> • Containing user calibration data • Default factory sensitivity = 4.9 V/Pa • Read/write by XL2 Audio and Acoustic Analyzer • NTi Audio ASD in accordance with IEEE P1451.4 V1.0, Class 2, Template 27
Impedance	Input: 20 GOhm // 0.26 pF, Output: 100 Ohm balanced
Power Supply	48 VDC phantom power, 3 mA typical
Attenuation	< 0.17 dB (Rphantom 2x 6.8 kOhm)
Connector	Balanced 3-pole XLR
Thread for Capsule	60 UNS2
Weight	90 g, 3.17 oz
Dimensions	Length 142.5 mm (5.6"), diameter 20.5 mm (0.8")
Temperature Range	-10°C to +50°C (14°F to 122°F)
Humidity	5% to 90% RH, non-condensing
NTi Audio #	600 040 040

The product specifications may vary based on the mounted microphone capsule type.

