

δ -Clapper Impulsive Sound Source

FOR REVERBERATION TIME MEASUREMENTS



δ -Clapper,
Impulsive Sound Source

The δ -Clapper is an easy-to-use impulsive sound source for reverberation time measurement in small and medium-sized rooms.

PROPERTIES

- Impulsive sound source for reverberation time measurements
- very wide usable frequency range - see typical spectrum
- Lightweight, yet durable wooden construction
- Easy manual operation

APPLICATIONS

As an impulse sound source for a quick overview measurement of the reverberation time.

Can be used for sound insulation measurements to determine the reverberation time in the receiving room without having to move the Dodecahedron loudspeaker.

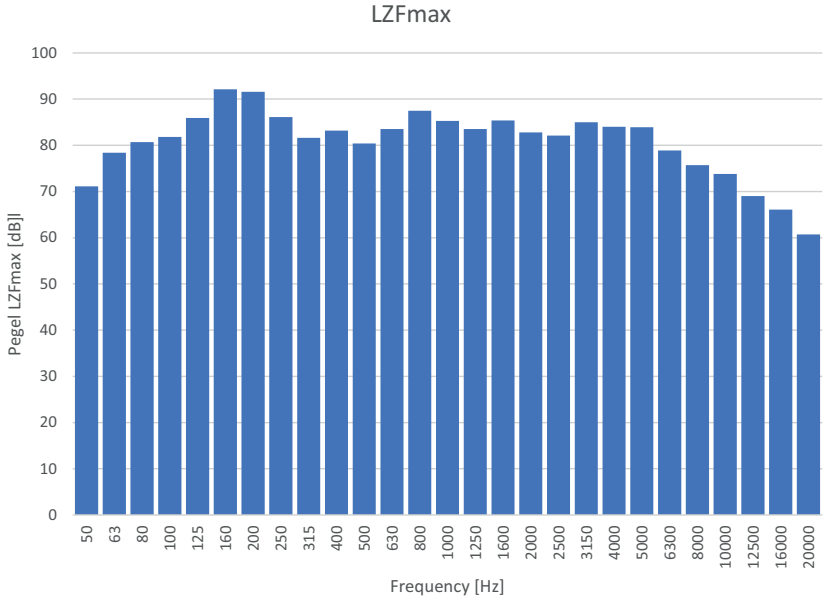
Application Tips

- Hearing protection must be worn during use!
- Store at 50 to 55% Relative Humidity
- Avoid drastic short-term temperature changes



δ -Clapper
(Scope of Delivery)

Technical Specifications

Spectrum (typical)	<p>L_{ZFmax} 2m Distance, semi-anechoic room</p>  <table border="1"> <caption>Typical Spectrum Data (LZFmax)</caption> <thead> <tr> <th>Frequency [Hz]</th> <th>Pegel LZFmax [dB]</th> </tr> </thead> <tbody> <tr><td>50</td><td>71</td></tr> <tr><td>63</td><td>78</td></tr> <tr><td>80</td><td>80</td></tr> <tr><td>100</td><td>81</td></tr> <tr><td>125</td><td>85</td></tr> <tr><td>160</td><td>92</td></tr> <tr><td>200</td><td>91</td></tr> <tr><td>250</td><td>86</td></tr> <tr><td>315</td><td>81</td></tr> <tr><td>400</td><td>82</td></tr> <tr><td>500</td><td>80</td></tr> <tr><td>630</td><td>83</td></tr> <tr><td>800</td><td>88</td></tr> <tr><td>1000</td><td>85</td></tr> <tr><td>1250</td><td>83</td></tr> <tr><td>1600</td><td>85</td></tr> <tr><td>2000</td><td>82</td></tr> <tr><td>2500</td><td>81</td></tr> <tr><td>3150</td><td>84</td></tr> <tr><td>4000</td><td>83</td></tr> <tr><td>5000</td><td>83</td></tr> <tr><td>6300</td><td>79</td></tr> <tr><td>8000</td><td>75</td></tr> <tr><td>10000</td><td>73</td></tr> <tr><td>12500</td><td>69</td></tr> <tr><td>16000</td><td>66</td></tr> <tr><td>20000</td><td>60</td></tr> </tbody> </table>	Frequency [Hz]	Pegel LZFmax [dB]	50	71	63	78	80	80	100	81	125	85	160	92	200	91	250	86	315	81	400	82	500	80	630	83	800	88	1000	85	1250	83	1600	85	2000	82	2500	81	3150	84	4000	83	5000	83	6300	79	8000	75	10000	73	12500	69	16000	66	20000	60
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max. Sound Pressure Level	$L_{ZPKmax} >128dB$ (1m)																																																								
Dimensions L x W x H	600 x 240 x 144 mm (23.6" x 9.45" x 5.7")																																																								
Weight	4.4 kg (9.7 lbs)																																																								
Temperature, Humidity in storage during use	-10° to +50°C (14° to 122°F) @ ≤ 90% RH (non-condensing) +5° to +35°C (41° to 95°F) @ ≤ 90% RH (non-condensing)																																																								
Material	Oiled wood surface																																																								
Scope of delivery	<ul style="list-style-type: none"> - Carrying bag - δ-Clapper - EP1 Hearing Protector 																																																								
Order Information NTi Audio #	600 000 550 600 000 552 (spare carrying bag)																																																								

DISTRIBUTOR CONTACT:
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Dodecahedron Speaker Kit

Omnidirectional Sound Source



DS3 Dodecahedron Loudspeaker with speaker stand



PA3 Power Amplifier (class-D)



DS3 Dodecahedron Speaker with Carrying Bag and Speaker Cable

The Dodecahedron Speaker Kit offers a lightweight, yet powerful signal source for room & building acoustic measurements. The optimized frequency response ensures precise measurements in accordance with the ISO 16283 and the ISO 3382 standards. The kit includes the robust omnidirectional DS3 Dodecahedron Speaker and the remote-controlled PA3 Power Amplifier (class-D).

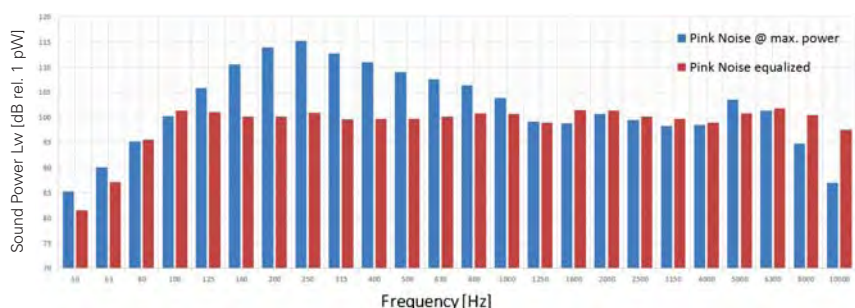
The dodecahedral design arranges 12 high-quality dynamic drivers for a uniform omnidirectional radiation of the acoustic test signal. The DS3 is powered by the portable PA3 power amplifier, which includes a Pink noise generator with an equalized output signal. The equalization ensures that the ISO 16283-1 requirement of ≤ 8 dB difference between contiguous one-third octave bands in the emitted sound is met. The wireless remote control allows the test signal to be switched ON/OFF from outside of the measurement room.

Key Features

- Equalized acoustic frequency spectrum from 100 Hz to 8 kHz
- Maximum sound power typ. 120.5 dB
- Compact, robust and lightweight
- Wireless remote control

Applications

- Room acoustics and building acoustics
- Airborne sound insulation analysis
- Absorption coefficient testing of building material



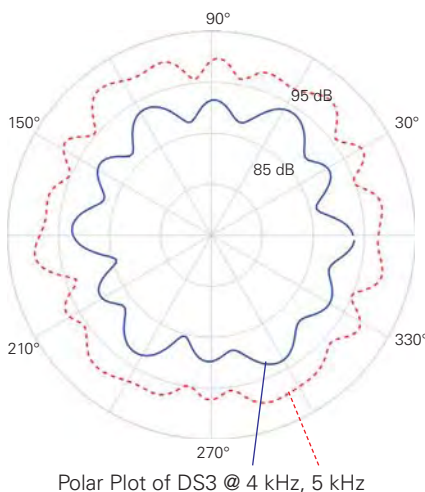
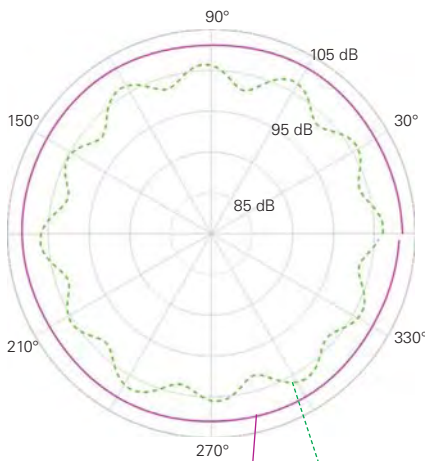
DS3 Sound Power Spectrum



Control panel of PA3 Power Amplifier

Specifications PA3 Power Amplifier

Maximum continuous output power	2*150 W into 2*4 Ω with Pink noise @ maximum level
Maximum short-term power	2*260 W into 2*4 Ω @ THD ≤ 1%
Protection	Dynamic compressor, temperature, overcurrent, DC, excessive clipping; visual indication via LEDs
Selectable signal sources	<ul style="list-style-type: none"> • Internal equalized pink noise (Cf = 2.5) • External signal, equalized • Internal pink noise, not equalized (Cf = 3.6) • External signal without equalization
Gain	-18 dB to 29 dB (via level control) mute
Power output Dodec configuration Bridge mode (load ≥ 8 Ω)	Speakon chn1: 1+ 1-; chn2: 2+ 2- 1+ 2-
Line-In Connector Level sensitivity Max. input level Impedance	XLR (balanced) 0 dBu for rated power into 2*4 Ω 20 dBu (±11 Vpp) ≥ 10 kΩ (balanced)
Subwoofer Line-Out Connector Gain Max. output level Impedance Cut-off filter	XLR (balanced) 3 dB (Line-IN to Subwoofer OUT) 18 dBu (±8.7 Vpp) ≤ 600 Ω 120 Hz low-pass filter Butterworth 24 dB/Octave (4 th order); complementary high-pass filter is automatically switched ON if subwoofer is active
Dimensions (L x W x H)	358 x 173 x 245 mm (14.1" x 6.8" x 9.7")
Weight	5 kg (11 lbs)
Power Supply	100 to 240 VAC, 50/60 Hz, 850 W, fuse T6.3 A
Temperature Range	0° to +50°C (32° to 122°F)
Cooling	Temperature controlled ultra-low-noise fan
Humidity Range	≤ 90% RH (non-condensing)
Order Information	NTi Audio # 600 000 506 (433 MHz) NTi Audio # 600 000 510 (USA, 315 MHz) NTi Audio # 600 000 511 (Japan, 426 MHz)



Specifications DS3 Dodecahedron Speaker

Standards	ISO140, ISO10140, ISO16283, ISO3382, ISO354, DIN52210, ASTM-E2235/-E336/-E90
Sound power level	> 120.0 dB re 1 pW (typical 120.5 dB re 1 pW)
Frequency range	50 Hz to 10 kHz
Input connector	Speakon (chn1: 1+/1- chn2: 2+/2-)
Speakers	12 speakers, 5" each, in dodecahedral configuration
Nominal impedance	2 x 4.2 Ω
Max. short-term peak power	600 W
Maximum input power RMS ¹⁾	320 W
Power compression ¹⁾	< 1 dB
Diameter	350 mm (13.8")
Weight	7.5 kg (16.53 lbs)
Order information	NTi Audio # 600 000 507
Accessories	<ul style="list-style-type: none"> • Included: Carrying bag, Speakon cable 5 m, Manufacturer Calibration Certificate • Optional: Speaker stand 35 mm, 130...230 cm retractable, with carrying bag (NTi # 600 000 508)

All information subject to change without notice.

¹⁾: @ 1 hour continuous maximum power with Pink noise signal, 9 dB crest factor

Impact Ball IB01

FOR IMPACT SOUND INSULATION MEASUREMENTS



Scope of delivery of the Impact Ball
(Bag and Meter included)

The IB01 Impact Ball is a lightweight, easy-to-use, and professional impact source for impact sound insulation measurements as described in ISO 16283-2:2020-11 for buildings as well as ISO 10140-5:2021 for laboratory applications.

The Impact Ball is very well suited to simulate low-frequency sound events, such as those caused by footsteps or children jumping on wooden beam ceilings.

APPLICATIONS

- Building acoustics
- Measuring the impact sound insulation of floors and stairs
- In situ and laboratory measurements
- The Impact Ball is dropped vertically from a height of 1 m (± 1 cm) at several positions, the Sound Pressure Level is measured in the receiving room
- Evaluation of Measurements and Reports by Sound Insulation Reporter software

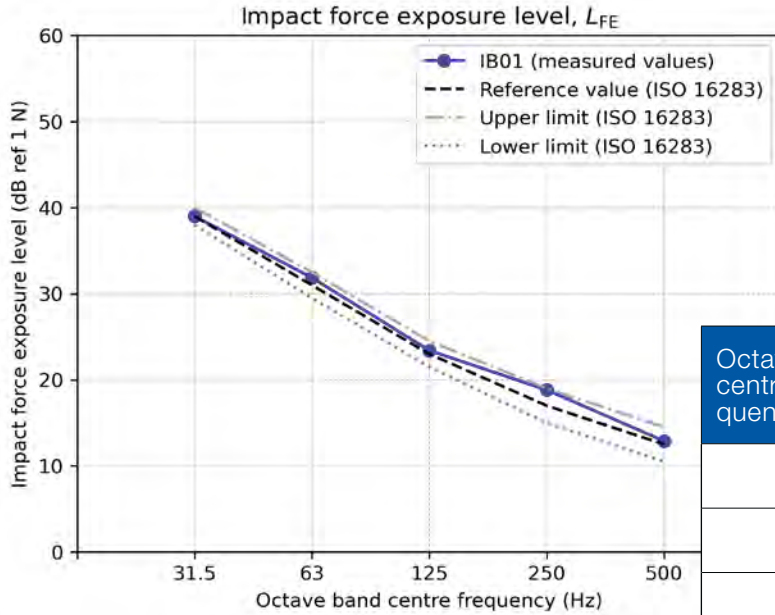
Features

- Low-frequency excitation
- Human activities' representation
- Efficient for environment with excessive background noise
- Easy-to-use
- Lightweight

Technical Specifications

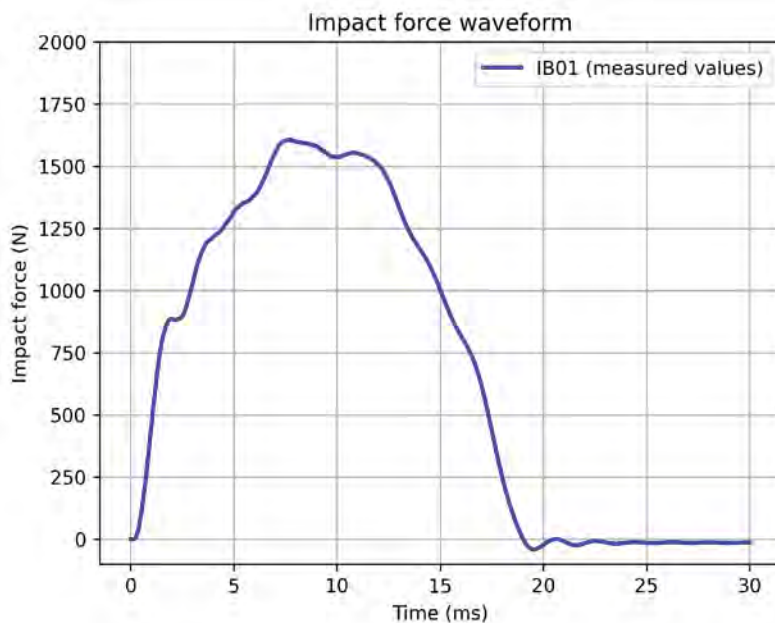
Material	Silicone
Dimensions (Diameter)	$\varnothing 180$ mm (± 1 mm) / 7.08" (± 0.04 ")
Weight	2.5 kg / 5.51 lb
Rebound coefficient	0.8 (± 0.1)
Rubber hardness	40 Shore A (± 0.5)
Temperature range	-10 ° to 40 °
Order Information NTi Audio #	600 000 560

IMPACT FORCE EXPOSURE LEVEL



Octave band centre frequency [Hz]	Impact force exposure level Limits [dB]	Impact force exposure level measured [dB]
31.5	39.0 ± 1.0	39.0
63	31.0 ± 1.5	30.9
125	23.0 ± 1.5	23.4
250	17.0 ± 2.0	18.8
500	12.5 ± 2.0	12.9

IMPACT FORCE WAVEFORM



DISTRIBUTOR CONTACT:
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TalkBox

ACOUSTIC GENERATOR - STIPA REFERENCE

 Made in Switzerland



STIPA REFERENCE IN ACC. WITH IEC 60268-16
SYSTEM LINE-UP
PRECISE FLATNESS
CALIBRATED LEVEL

Introduction



The TalkBox is an active acoustic signal generator for speech intelligibility measurements of evacuation and announcement systems, as well as for level alignment of teleconference or any audio system incorporating a microphone input. In combination with the XL2, it facilitates complete end-to-end evaluation of the speech intelligibility STIPA from the talker's microphone to the listeners' ears.

The TalkBox simulates a human talker (60 dBA @ 1 meter according to the IEC 60268-16 standard) 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.

The TalkBox features human head-like dimensions and is based on a solid-state generator. It replays the STIPA test signal with a precise frequency response, individually equalized for each TalkBox, also ensuring best performance through the internal amplifier and the precision loudspeaker. A variety of supplied or user-defined test signals may be faithfully reproduced for different alignment application areas.

Application Areas

- Evacuation System Commissioning
- Installed Sound System Calibration
- Classroom testing
- AV Installations



TalkBox

Portable and easy to operate



How can a TalkBox help you?

The TalkBox is a professional tool that simplifies STIPA measurements. It combines sound samples, an amplifier, and a loudspeaker into a lightweight, human-head-sized box. It delivers the built-in equalized acoustic test signals at exactly the levels specified by the standard. Pop it onto a microphone stand to position it where the mouth of the human speaker would normally be.

The NTi Audio TalkBox removes the uncertainties and reduces your effort, as it is designed precisely for this use; it assists you in testing the entire signal path, including the microphone and the acoustic environment. Also, the Line Out connection may be used to inject test signals into systems which do not include an announcement microphone.

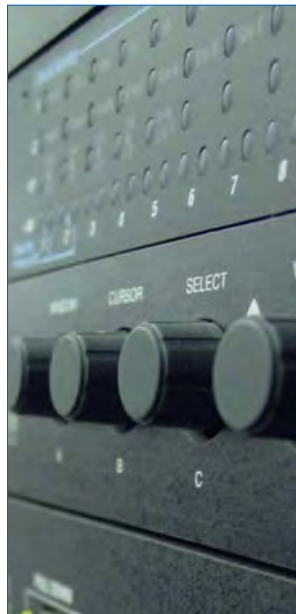
Testing the whole signal chain

The TalkBox, together with the XL2 Acoustic Analyzer, are used to test the entire signal chain from the speaker's mouth to the listeners' ears, considering the acoustic environment of both the sending and the receiving rooms.



Acoustic Input

- Microphone (Frequency Response & Distortion)
- Room Acoustics
- Background Noise



Audio Processing

- Distortion
- Noise
- Limiter
- Amplifier



Acoustic Output / Distribution

- Speakers (Frequency Response & Distortion)
- Room Acoustics
- Background Noise

Calibrating Conference Systems



Teleconference systems play a significant role in today's connected world, allowing companies to communicate seamlessly across continents. Proper system alignment, delivering consistent speech levels and excellent intelligibility is a key success factor for the installing company.

The conference participants expect that they be allowed to concentrate on the business topics at hand and not be distracted by any inadequacies or failures in the communication system. NTi Audio equipment provides you with the tools to align the systems and rooms with excellence and confidence.

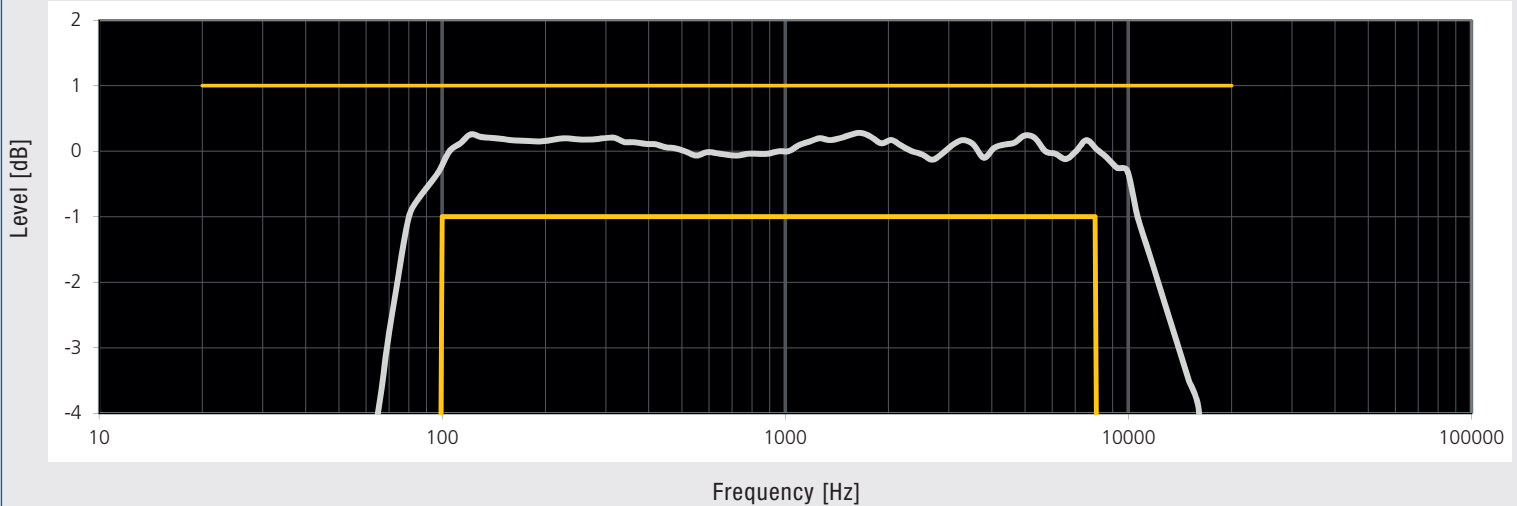
The NTi Audio TalkBox simplifies and improves the setup of microphones, system levels and equalization. It generates a reference human speech signal or other standard audio test signals, so that entire conference systems can be adjusted by a single person. Additional test signals support the determination of system flatness and response effects e.g. in teleconference applications.

The TalkBox generates all test signals for professional conference room setup. Typically the TalkBox is placed at measured reference points, those being each anticipated speaking position in the room. The XL2 then objectively measures speech intelligibility at the different listening positions.

The TalkBox is also often used to objectively determine the intelligibility of speech in rooms where no amplification system is used, such as in classrooms. In this case only the acoustic environment is tested. The TalkBox is placed at the teacher's usual speaking position while the XL2 objectively measures speech intelligibility at the different student positions.

Essential TalkBox features

Typical Frequency Response (meets the specified ± 1 dB tolerance band IEC 60268-16 requirement)



Individually Equalized

The NTi Audio TalkBox includes a precision broadband loudspeaker. Precise flatness of ± 1 dB over the relevant frequency range and the highest reproduction quality are guaranteed by individual equalization and calibration using advanced FIR filtering and DSP technology. The radiation characteristic complies with ITU-T P.51 in wide ranges.

Calibrated Output Level

The IEC 60268-16 standard specifies a sound pressure level for a speaker simulator of 60 dBA at 1 meter distance. The TalkBox output levels are calibrated to comply with this standard. To avoid operating failures the TalkBox has no volume control.

Balanced Line Out

Using the balanced Line Out, the TalkBox operates as an audio signal generator. Deviations in sampling frequency - a dangerous trap when using CD players for STIPA measurements - are eliminated.

Universal Power Supply

The TalkBox supports a power supply range of 10 - 18 VDC. An external power supply for worldwide operation is included.

Standard and Custom Signals

The TalkBox also generates additional waveforms; white noise, pink noise, sine wave, reference speech signals and the delay time measurement chirp. Custom signals may be loaded onto the CF Card and are seamlessly looped.

Lombard Effect

Human voices tend to rise in level in emergency situations. In order to reproduce this so-called Lombard effect, all STIPA-related signals are additionally available at an increased level of 70 dBA at 1 meter distance.

Balanced Line In

Any external signal can be connected to the system using the balanced Line In. The signal is simultaneously looped to the Line Out and reproduced through the internal DSP to the loudspeaker.

Technical Specifications

TalkBox			
Waveform	<ul style="list-style-type: none"> Up to 15 different signals Waveforms can be added / changed by the user Factory signal set: NTi Audio STIPA Test Signal, Reference Speech Signal, Sine 1 kHz, White Noise, Pink Noise, Delay Time Chirp 	Acoustical Output Level	<ul style="list-style-type: none"> STIPA: 60 dBA @ 1m ± 0.5 dB, acc. IEC60268-16 STIPA band sensitivity gradient: - 0.07 dB / °C (average) Others see track list in user manual
Line Out	<ul style="list-style-type: none"> XLR, balanced 100 Ω, unbalanced 50 Ω Maximum output level: +18 dBu 	Power Supply	<ul style="list-style-type: none"> 10 - 18 VDC, 10 W External switching power supply included (for worldwide usage 100 V .. 240 V)
Line In	<ul style="list-style-type: none"> XLR, balanced 38 kΩ Maximum input level: +18 dBu Internal delay XLR input to speaker: 59 ms 	External Mute	Jack 3.5 mm (1/8") Floating switch required
CF Card	<ul style="list-style-type: none"> 512 MB included, FAT32 formatted Wave file format: 16 bit, 44.1 kHz mono 	Mounting	Mic Stand 5/8" with Adapter to 3/8"
Acoustical Flatness	<ul style="list-style-type: none"> STIPA band levels (on-axis) typ. < ±0.5 dB @ 24°C typ. < ±1.0 dB @ 10°C – 30°C 	Dimensions	L x W x H: 150 x 150 x 175 mm (5.9 x 5.9 x 6.9 inch)
		Included Accessories	<ul style="list-style-type: none"> Mains Power Adapter CF Card Soft Carrying Case
		Weight	3.5 kg

Related Products

Signal Generator



Analog Audio: Minirator MR-PRO

Analyzer



XL2 Analyzer with STIPA Option

Sound Source



DS3 Dodecahedron Loudspeaker and PA3 Amplifier

TalkBox



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and PA3 Power Amplifier are trademarks of NTi Audio AG.

TM EOS2 Tapping Machine

IMPACT SOUND INSULATION MEASUREMENT SOURCE



The TM EOS2 Tapping Machine is a precision impact noise source specifically designed for building acoustic measurements. It is primarily utilized for assessing impact sound insulation of ceilings and stairs in buildings. The TM EOS2 Tapping Machine complies with the standards ISO 10140, ISO 16283, ISO 717, DIN 52210, BS 5821, ASTM E 492, and SIA 181:2020.

KEY FEATURES

- **Electromagnetic Drive:** Ensures quiet operation and reduces airborne noise for precise results.
- **Robust Design:** Features a laser-cut aluminum frame with three adjustable rubber feet and a comfortable grip.
- **Mains or Battery Powered:** Operates on mains power (100 - 240 V) or a built-in lithium battery pack for up to 1 hour on hard floors and approximately 50 minutes on soft floors.
- **Reliable Remote Control:** Operates at 434 MHz (868 MHz) with options for manual operation or delayed start.
- **Optimized for Floor Types:** Individual switch for optimizing operation on hard and soft floors.
- **Type Tested:** Complies with relevant standards and is tested for accuracy in impact sound

APPLICATIONS

Building acoustic measurements in compliance with ISO 10140, ISO 16283, ISO 717, DIN 52210, BS 5821, ASTM E 492, and SIA 181:2020.

Technical Specifications	
Standards	ISO 10140, ISO 16283, ISO 717, DIN 52210, BS 5821, ASTM E 492, SIA 181:2020
Power Supply	Input: 100 - 240 V; 50 - 60 Hz; 125 W Battery Voltage: 25.2 V Battery Life: ~1 hour (hard floors), ~50 minutes (soft floors) Charging Time: 5-6 hours
Battery Pack	Type: Lithium Battery Capacity: 4900 mAh Cell Voltage: 3.6 V (7 cells)
Characteristics	Built-in Lithium Battery Pack Membrane Keyboard Delayed Start Function Inspection Doors
Remote Control	Frequency: 434 MHz (868 MHz)
Impact Hammers	Number: 5 Weight: 500 ± 4 g Drop Height: 40 mm Drop Speed: 0.886 ± 3% m/s Impact Interval: 100 ms (10 Hz ± 1%) Distance Between Hammers: 100 ± 3 mm Head Diameter: 30 ± 0.1 mm (steel) Impact Surface: Spherical with a curvature radius of 500 ± 30 mm
Construction	Laser-cut aluminum frame with three adjustable rubber feet and a comfortable grip
Adjustable Floor Hardness	Hard: Concrete, slabs Soft: Wood, carpet
Dimensions (L x H x P)	480 x 245 x 122 mm (or 48 x 12 x 25 cm)
Weight	9 kg (including built-in battery pack)
Comes with	Battery pack Soft bag AC cable Wireless remote control (434 MHz) User Manual ISO Certification
Order Information	NTi Audio # 600 000 570

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