

Technical Data Minirator MR1

Outputs	Balanced XLR, unbalanced RCA, phantom power resistant		
Waveforms	Sinusoidal, Square, White Noise, Pink Noise, Polarity		
Frequency Range	20 Hz - 20 kHz in 31 steps (Sine) 20 Hz - 5 kHz in 25 steps (Square)		
Sweep Capabilities	20 Hz - 20 kHz with sinusoidal signals		
Sweep Speed	0.05, 0.5, 1, 2, 3, 4, 5 seconds per step		
Units	dBu, dBV, V selectable		
Level Ranges	Waveform	Range	Steps Inc.
	Sine, Square,	-76 dBu to +6 dBu	42 2 dBu
	White Noise,	-78 dBV to +4 dBV	42 2 dBV
	Sweep	0.13 mV to 1.6 V	± 23 %
	Pol Test	-76 dBu to +4 dBu	2 dBu
		-78 dBV to +2 dBV	2 dBV
		0.13 mV to 1.25 V	± 23 %
	Pink Noise	-56 dBu to -4 dBu	2 dBu
		-58 dBV to -6 dBV	2 dBV
		4 mV to 500 mV	± 23 %
Flatness	± 0.5 dB		
Accuracy	± 0.5 dB		
THD+N	< -72 dB (0.025 %) typical @ 6 dBu < -55 dB (0.18 %) or 100 µV over all max.		
White Noise	20 Hz - 20 kHz, Crest factor = 2.12		
Pink Noise	20 Hz - 20 kHz, Crest factor = 3.27		
Output Impedance	200 Ohm balanced & unbalanced		
Auto Power Off	10, 30, 60 minutes or OFF		
Batteries	2 x 1.5 V Dry or NiCd type cell, LR 6, AA, AM3 types		
Battery Lifetime	> 20 hours of continuous operation typical		
Temperature Range	0° C to 45° C (32° F to 113° F)		
Humidity	< 90 % R.H., non condensing		
Dimensions (LxWxH)	140 x 74 x 25 mm (5.5" x 2.9" x 1.00")		
Weight	170 g (6 oz) incl. batteries		

MINIRATOR MR1

Analog Audio Generator



Minirator MR1 is the powerful analog audio generator providing you with a comprehensive set of audio test signals as required by a professional audio environment.

This handy tool enables you to stimulate any analog device with a broad range of appropriate signals for performance checking, maintenance and repairs.

Convenient, reliable and optimized: Minirator MR1 fits in to your pocket as well as in your budget.

SIGNALS

Sinusoidal Signal

Square Wave

White- / Pink Noise

Polarity Test Signal

Frequency Sweep

FEATURES

20 Hz to 20 kHz

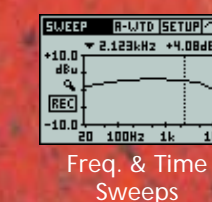
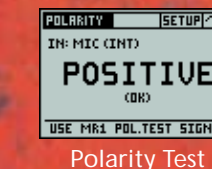
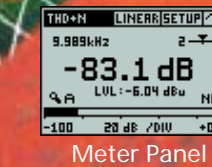
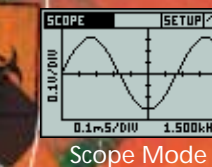
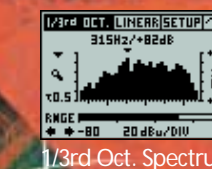
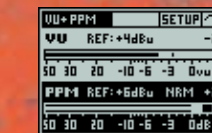
Levels adjustable

Low distortion



MINILYZER ML1

Analog Audio Analyzer



RMS Levels

Distortion Analyzer

PPM + vu Meter

Sweep Recording

Speaker Polarity Test

Scope

1/3rd Octave Spectrum

Signal Balance Error

Minilyzer ML1 is the state-of-the-art audio analyzer that fits into the palm of your hand. It provides you with a comprehensive set of functions essential for the analysis of professional audio systems.

The powerful Minilyzer ML1 continuously measures the signal and displays the desired results with all complementary information on an illuminated hi-res graphical LC-Display.

Minilyzer ML1 together with the signal generator Minirator MR1 is the unbeatable mobile test system for high-end demands in the audio industry.

Technical Data Minilyzer ML1

Measurements	Level-RMS, Level-Relative, THD+N, vu+PPM, Frequency, Polarity, Signal Balance Error, Sweep, 1/3 rd Octave Spectrum, Scope
Level	Units: dBu, dBV, V _{RMS} Accuracy: ± 0.5 % @ 1 kHz Flatness: ± 0.1 dB Bandwidth: 20 Hz to 20 kHz Resolution: 3 digits (dB-scale) or 4 digits (V-scale)
Frequency Range:	10 Hz to 20 kHz
Resolution:	4 digits
Accuracy:	< ± 0.1 %
THD+N (Total Harmonic Distortion + Noise)	Meas. Bandwidth: 10 Hz to 20 kHz Resolution: 3 digits (dB-scale) or 4 digits (%-scale) Residual THD+N: balanced < -85 dB @ -10 dBu to +20 dBu unbalanced < -74 dB @ 0 dBu to +14 dBu
vu & PPM (vu-Indicator and Peak Program Meter)	according to IEC 60268 and DIN 45406. PPM Type I, IIa and Nordic. Both meters with adjustable reference and with analog & numerical peak-hold readout.
Polarity Test (with MR1 test signal)	Positive/Negative detection through internal microphone or XLR/RCA connector. Checks polarity of tweeters, midrange-speakers, woofers and cables down to 10 dB S/N input signal.
Signal Balance Error	Indication range 0.0 % to 100 % Deviation from perfect balance in % or *1
Sweep	Level vs. Frequency or Level and THD+N and Frequency vs. Time
1/3rd Octave	Spectrum acc. IEC 1260, class II and ANSI S1.11-1976, class II from 50 Hz to 20 kHz, Bargraph for Level RMS 20 Hz to 20 kHz
Scope	Auto triggering, auto ranging, auto scaling
Filters	Linear, A-weighting, C-message, Highpass 22 Hz / 60 Hz / 400 Hz, Voice bandpass
Input Connectors	XLR balanced, RCA unbalanced
Input Impedance	40 kOhm balanced, 20 kOhm unbalanced
Input RMS (upper meas. limit)	+20 dBu balanced, +14 dBu unbalanced use ML1 Adapter -20 dB for balanced levels < 40 dBu
Max. DC Input	±50 V _{DC}
Residual Noise	< 12 µV, XLR-input shorted
Microphone Input	Omnidirectional (for Polarity measurement only)
Monitor Output	Jack 3.5 mm (1/8"), suitable for all common headsets
Display	Backlit graphic LCD, 64 x 100 pixel
Batteries	3x AA package dry batteries (alkaline) Typical battery lifetime > 16 hrs
Dimensions (LxWxH)	163 x 86 x 42 mm (6.4" x 3.38" x 1.63")
Weight	300 g (10.5 oz) incl. batteries
Temperature	0° to +45° C (32° to 113° F)
Humidity	< 90 % R.H., non condensing

All information subject to change without notice.



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MI 1101 E 15.000 G.05.01



Photographer: Mathias Grabher

Minstruments Accessories



System Case



Soft Pouch



ML1 Adapter -20 dB



Copy Cable



Performing at the Bregenz Festival
Every night during the summer the well known Bregenz Festival in Austria is attracting up to 7000 spectators into the world of opera with a spectacular show on its giant floating stage. Not an easy task, considering the fact that the Festival held at the shores of Lake Constance is an open air venue. To ensure all the spectators enjoy the very high quality performance of music and singing, the acoustics department has installed 80 state-of-the-art PA systems around the stage. Checking and maintaining those were very time consuming tasks. Now Bruno Hämmerle (Technical Audio Support) and the acoustic team are using NTI's Minstruments for those purposes: «Checking the polarity, for instance, of all required systems with the Minstruments is incredibly simple. All it is about clicking two or three buttons. The saving of time is enormous since we brought those handy tools into action.» Another task carried out almost by itself using NTI's Minstruments is the regular checks of the different audio setups, Mr. Hämmerle says: «I can't imagine to carry out checks without the Minstruments anymore.»

MiniSPL

- 1/2" Microphone**
- Battery Powered**
- Balanced Output**
- Precise**
- Omni-directional**
- Calibrated**



The MiniSPL is the perfect accessory for the Minilyzer for acoustical measurements. Together they are forming a comprehensive integrating sound level meter.



Technical Data MiniSPL

Microphone Type	1/2", omni-directional, pre-polarized condenser, free field transducer
Sensitivity	(20 ±2) mV/Pa, (-34 ±1) dBV/Pa @ 1 kHz balanced out
Frequency Response	100 Hz - 1250 Hz ±1.5 dB 20 Hz - 20 kHz ±3 dB in accordance with IEC60651, Type 2
Peak Acoustic Input	130 dB _{SPL} @ 1 kHz
Noise	30 dB _{SPL} , A-weighted
Output Impedance	200 Ohm (XLR balanced)
Power Supply	1x AA battery 1.5 V, battery lifetime typical 300 hrs no phantom power required, phantom power resistant
Dimensions (DxL)	Ø 22 x 180 mm, Ø 0.87" x 7"
Weight	100 g (3.5 oz) incl. battery

Technical Data Minilyzer ML1

(firmware 2.00 or higher, applicable with MiniSPL only)

Measurements	Sound Pressure Level, 1/3 rd Octave Spectrum
Acoustical Functions	in accordance with IEC60651 and IEC 60804 • Instantaneous Sound Pressure Level (Lp) • Maximum/Minimum Sound Pressure Level (Lmax/Lmin) • Time Response selectable • Weighting Filters • Equivalent Continuous Sound Pressure Level (Leq) • Start-, Pause-, Stop function
Measurement Results	Units dB _{SPL} , dB _{Leq} Resolution 0.1 dB Display Ranges 20 - 140 dB _{SPL} in 3 bands: 20 - 100 dB _{SPL} 40 - 120 dB _{SPL} 60 - 140 dB _{SPL}
	Bandwidth 20 Hz to 20 kHz Flatness ±0.1 dB
Time Response	Selectable Fast, Slow, Impulse
Weighting Filters	Selectable A, C, Linear, X-CURVE ¹ for 1/3 rd Octave Spectrum
Integration	Start-, Pause-, Stop function
1/3rd Octave Spectrum	31 octave band display 20 Hz to 20 kHz, selectable filters A, C, Linear, Bargraph dB _{SPL}
Sensitivity & Calibration	Selectable default value (MiniSPL), calibration using an external source, selectable sensitivity value

The Minstruments Series

Audio measurement solutions
in the palm of your hand
at a price that won't break the bank!

