

Production Analyzer

Rev. 1.2-1.6 (USB + FireWire)
Rev. 2.x (USB only)

H4

Hardware unit for Klippel QC System

FEATURES

- Two channel speaker monitoring
- Voltage and current Sensors
- Two channel Microphone Input
- Built in IEPE Mic power supply
- Symmetrical Line Output
- PC-controlled operation
- Digital General Purpose I/O port
- Automatic self-calibration
- Automatic firmware update
- 19 inch / 2 units case



The Production Analyzer is the sensor and data acquisition basis for the Klippel QC software. It comprises of a dedicated sensor front-end for speaker measurement as well as professional AD/DA converter. A modular concept provides a flexible architecture to modify resolution, frequency range and number of input / output channels easily.

The Production Analyzer is equipped with built in current and voltage sensors, provides microphone power supply, symmetrical in- and outputs and digital I/O. This hardware allows performing highly flexible tests on electro-acoustical transducers. It is a two-channel system, which allows measuring two speakers under test in parallel or allows measuring one driver while mounting the second driver in time critical applications such as End of line testing.

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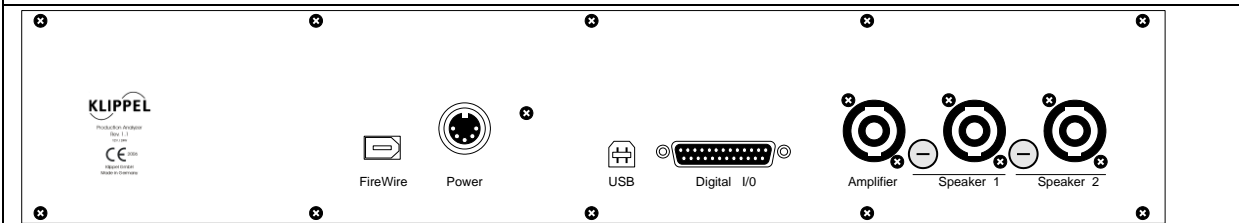
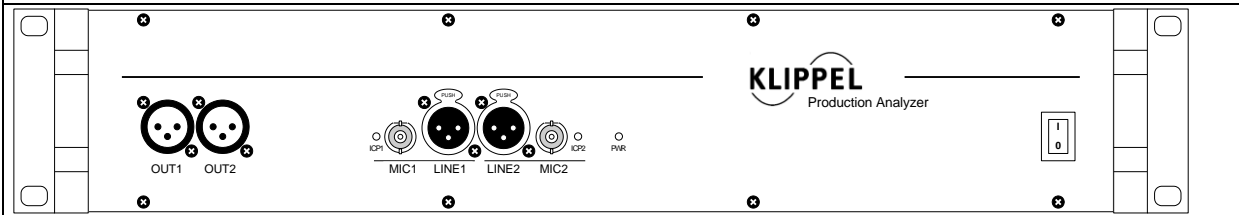
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Klippel GmbH
Mendelssohnallee 30
01309 Dresden, Germany

www.klippel.de
info@klippel.de

TEL: +49-351-251 35 35
FAX: +49-351-251 34 31

Connections



FireWire	Audio data bus from PC to Production Analyzer. Only required for PA version 1.x
Mic 1, 2	Microphone input with internal IEPE compliant microphone power supply. The input Mic level may be passively attenuated by 20 dB using an internal fixed gain switch to prevent from clipping at high microphone output.
OUT 1,2	The XLR output connectors provide a symmetric analog output signal at pin 2 and 3 and ground at pin 1. If asymmetric output is required use pin 2 and pin 1. You must short pin 3 to ground (pin 1).
Power	Input from external DC Power Supply. Use Klippel power supply only.
USB	USB control bus for routing, speaker on/off, digital I/O. Note: For PA version 2.x (USB only) a Klippel certified USB cable must be used to ensure proper operation (e.g. KLOTZ USB-AB1).
Digital I/O	Digital inputs and outputs may be used to control external equipment such as industrial components, footswitches, buzzers etc.
Amplifier	The SPEAKON [®] input connector is to be connected with a 2-channel output signal of the power amplifier. The signals supplied to pins 1- and 1+ will be provided to the Speaker 1. The signal at the pins 2- and 2+ provide the signal to the Speaker 2.
Speaker 1, 2	The SPEAKON [®] output connector is to be connected to the terminals of the loudspeaker under test by using pins 1+ and 1- of the loudspeaker cable. The pins 2- and 2+ of the connector are used to sense the voltage at the loudspeaker terminals (Kelvin configuration).
Fuse 1, 2	Next to the connectors Speaker 1/2 connectors fuses are installed to protect the test object and the measurement hardware from excessive currents. According to the hardware version of the Production Analyzer (sensitivity and the current capability) different fuse types are installed. Please refer to the table below for more information.

Electrical Characteristics

Sampling Rates	f_{sample}		48 / 96 / 192		kHz
Upper Frequency Limit	f_{max}		20 / 40 / 80		kHz
Analog Line Inputs					
Parameter	Symbol	Min	Typ.	Max	Unit
Input Voltage swing (peak)	$U_{in, sw}$	-10		10	V
Input Voltage (peak to peak, balanced)	U_{in}			40	V
Input Impedance	R_{in}		10		k Ω
Frequency Response 20 Hz to 20 kHz			± 0.1		dB
Frequency Response 20 Hz to 40 kHz			± 0.1		dB
THD @ 1 kHz (1V in, G=0 dB)	THD_{in}		90		dB
THDN @ 1 kHz (1V in, G=0 dB, BW 24 kHz)	$THDN_{in}$		85		dB
SNR (G=0 dB, 0 dB FS, BW: 24 kHz)	SNR_{in}		95		dB
Input Crosstalk attenuation (1 kHz)			90		dB
Common Mode Rejection Ratio (1 kHz)	$CMRR_{in}$		85		dB
Microphone (IEPE) Input					
Constant current source	I_{IEPE}		3		mA
Input voltage swing (peak), 10dB gain input	U_{IEPE}	-3.5		3.5	V
Input voltage swing (peak) High Level Version*	U_{IEPE}	-25*		25*	V
Input voltage swing (peak), 0dB gain input*	U_{IEPE}	-10*		10*	V
Input frequency range (+0 / -0.3dB)	f_{IEPE}	12		40k	Hz
THD @ 1 kHz (Gain 0dB, 1V)	THD_{IEPE}		90		dB
THDN @ 1 kHz (Gain 0dB, 1V, BW : 20kHz)	$THDN_{IEPE}$		85		dB
SNR (G=0dB, -6 dB FS., BW : 20 kHz)	SNR_{IEPE}		95		dB
Input crosstalk attenuation (1 kHz)			80		dB
* special option					
Analog Line Outputs					
Output Voltage swing (peak)	$U_{out, sw}$	-4		4	V
Output Voltage swing (peak)	$U_{out, sw}$	-10*		10*	V
Output Impedance	R_{out}		50		Ω
Frequency Response 20 Hz to 20 kHz			-0.6 / +0.1		dB
Frequency Response 20 Hz to 40 kHz			-1 / +0.1		dB
THD @ 1 kHz (1V in, G=0 dB)	THD_{out}		90		dB
THDN @ 1 kHz (1V in, G=0 dB, BW 24 kHz)	$THDN_{out}$		85		dB
SNR (G=0 dB, -6 dB FS, BW: 24 kHz)	SNR_{out}		100		dB
Output Crosstalk attenuation (1 kHz)			90		dB
Minimal Load Impedance	$R_{L, min}$	600			Ω
Output Current	$I_{out, max}$			16	mA
* special option					

Speaker 1 and Speaker 2					
Parameter	Symbol	Min	Typ.	Max	Unit
Voltage, accuracy (1 kHz)					
Voltage, peak	U_{peak}		±0.1	±0.5	%
Frequency response (-0.3dB)	f	12		40k	Hz
THD (10V, 1kHz)	THD_U	85			dB
THDN (10V / BW: 24 kHz)	$THDN_U$	75			dB
Current accuracy (1kHz)					
Default (15A):					
Recommended for Re	R_e	<1	4	16	Ω
Frequency response (-0.3 dB)	f_l		20		KHz
THD (2A / 1kHz)	THD_I	60	65		dB
THDN (2A, 1kHz, BW: 24 kHz)	$THDN_I$	60			dB
SNR @ 1 kHz (10A / BW: 24 kHz)	SNR_I		75		dB
Current, peak (short term)	I_{peak}	40	50		A
Current, rms 10s max. (sine) (fused with 15A)	$I_{rms,10s}$		20		A
Current, rms (continuous)	I_{rms}		15		A
Fuse 15A (Manufacturer: Littelfuse)	Type: 313.015 = default (slow-blo [®]), 312.015 = alternative (fast acting)				
Fuse package size: 3AG	$\varnothing \times l$		6.3 x 32		mm
Fuse cold resistance	R_{Fuse}	5.0 (default), 5.2 (alternative)			m Ω
Resistance primary (current sensor)	R_p		<0.5		m Ω
High Sensitivity (1A, Special version for e.g. micro speaker):					
Recommended for Re	R_e	8		100	Ω
Frequency response (-0.3 dB)	f_l		20		KHz
THD (1A / 1kHz)	THD_I	70			dB
THDN (0.1A, 1kHz, BW: 24 kHz)	$THDN_I$	60			dB
SNR @ 1 kHz (0.1A / BW: 24 kHz)	SNR_I		75		dB
Current, peak (fused with 1A)	I_{peak}		2		A
Current, rms (continuous)	I_{rms}		1		A
Fuse 1A (Manufacturer: Littelfuse)	Type: 312.001 = default (fast acting), 313.001 = alternative (slow-blo [®])				
Fuse package size: 3AG	$\varnothing \times l$		6.3 x 32		mm
Fuse cold resistance	R_{Fuse}	190 (default), 375 (alternative)			m Ω
Resistance primary (current sensor)	R_p		1		Ω
Very High Sensitivity (0.1A, Special version for e.g. headphone driver):					
Recommended for Re	R_e	100		2000	Ω
Frequency response (-0.3 dB) (-1 dB)	f_l		20 80		KHz
THD (0.1A / 1kHz)	THD_I	70			dB
THDN (0.1A, 1kHz, BW: 24 kHz)	$THDN_I$	60			dB
SNR @ 1 kHz (0.1A / BW: 24 kHz)	SNR_I		75		dB
Current, peak (fused with 0.5A)	I_{peak}		1		A
Current, rms (continuous)	I_{rms}		0.5		A
Fuse 0.5A (Manufacturer: Littelfuse)	Type: 312.500 = default (fast acting), 313.500 = alternative (slow-blo [®])				
Fuse package size: 3AG	$\varnothing \times l$		6.3 x 32		mm
Fuse cold resistance	R_{Fuse}	498 (default), 1260 (alternative)			m Ω
Resistance primary (current sensor)	R_p		10		Ω

General Specifications	
Dimensions	19 inch / 2 rack units
Weight	5 kg
EMC	IEC 61326:1997 + A1:1998 + A2:2000 (EN 61326:1997 + A1:1998 + A2:2001)
Safety	IEC 61010-1:2001 (EN 61010-1:2001)

Find explanations for symbols at <http://www.klippel.de/know-how/literature.html>



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