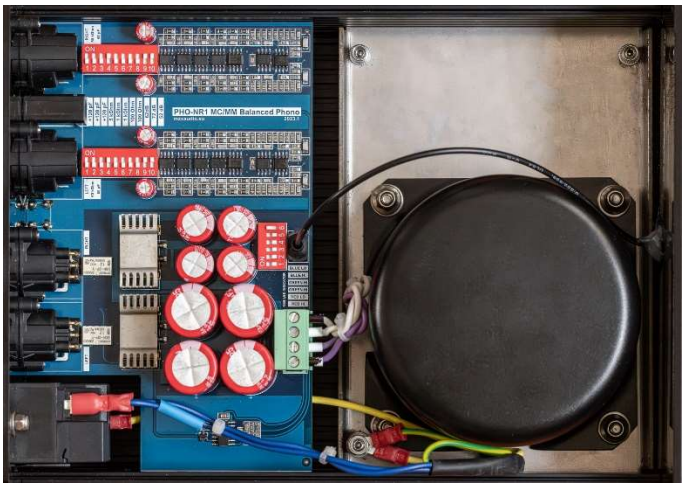
Features

- True balanced working principle, the signal is never referenced to the ground.
- With only balanced input and output, the RCA connection doesn't compromise.
- Adjustable input load capacitance and resistance
- Selectable 3 different gain levels to match the sensitivity of different MM and MC cartridges.
- Extreme low noise symmetrical stages with active RIAA equalization to avoid loss loop-gain
- From input until output DC coupled, no AC coupling capacitor, fully balanced DC servo
- Output DC protection and muting under turning on & off
- Low noise and high input & load regulation internal linear power supply
- Adjustable front LED indicator's color and intensity
- 3 years manufacturer's warranty

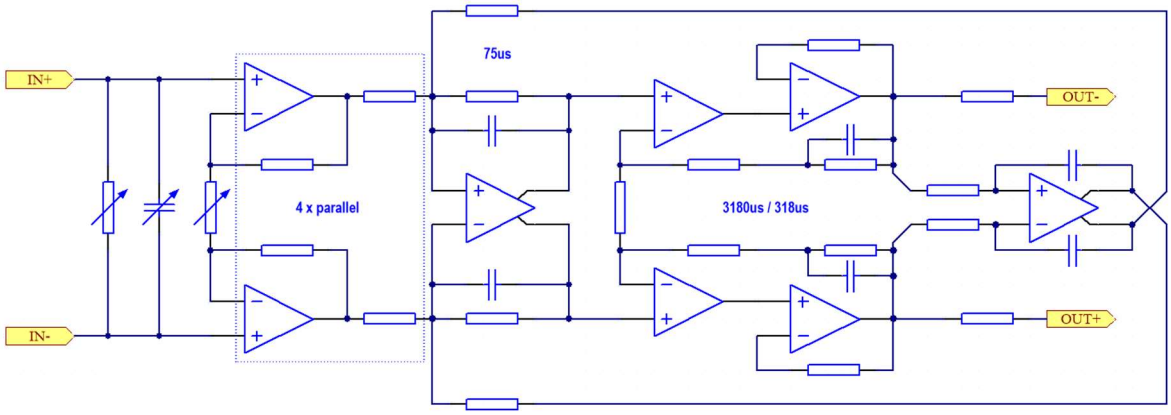
Components

- Gold-plated signal connectors and silver-plated banana socket for grounding
- Precision thin-film resistor network and very stable Class I C0G multilayer chip capacitors in the audio path
- Selectable 50VA toroid transformer with impregnated core & shielding winding in a magnetic shielding can or well-filtered 30W medical grade SMPS that creates a hybrid powering system with the following linear PSU
- Extruded aluminum enclosure anodized black, high gloss black front and backplate

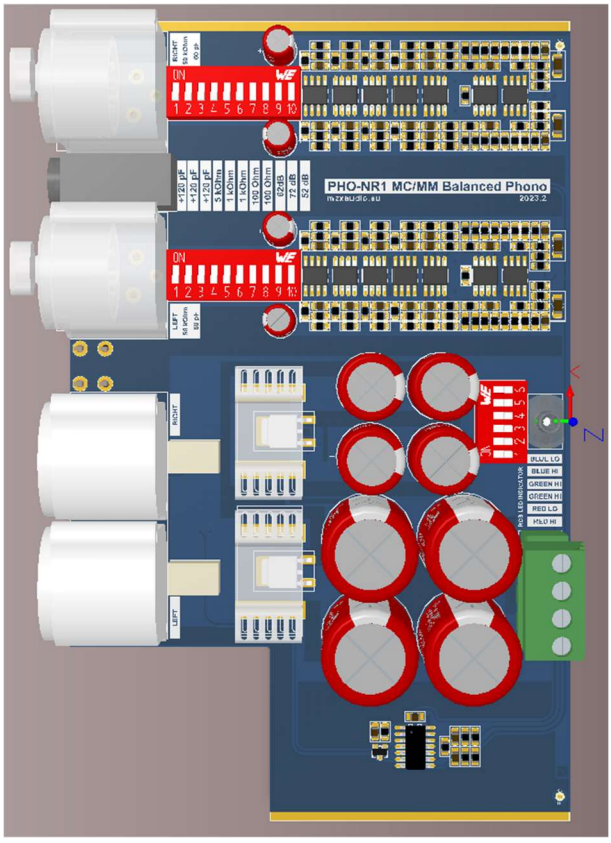


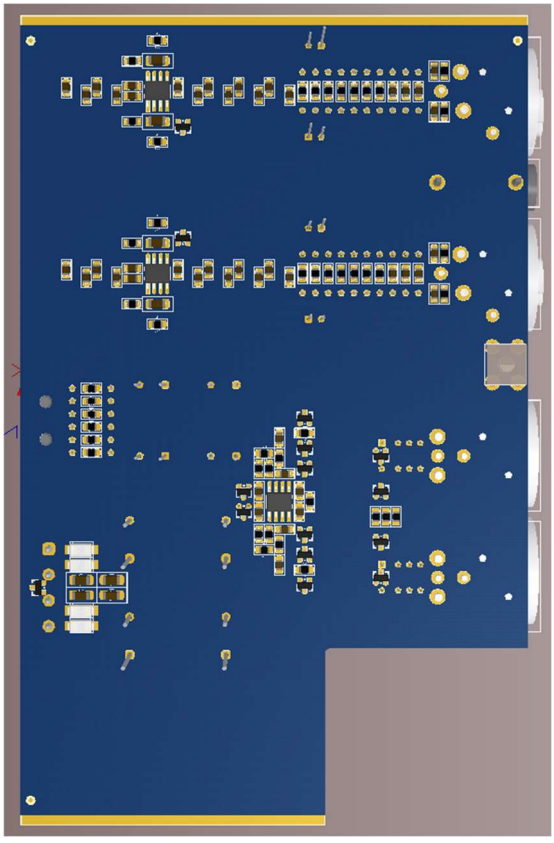
The PHO-NR1 symmetrical phono applies a state-of-the-art level and truly balanced circuitry to achieve exceptionally ultralow noise and distortion. In the input stage, 4 dual low noise op-amps work parallel to decrease the noise by 6dB. It is followed by a fully differential amplifier stage with the integrated 75µs equalization. Finally, a composite amplifier built from a FET input operational amplifier is responsible for the accurate 3180 / 318µs equalization, and the current feedback amplifier (buffer) ensures powerful driving of the output and the connected signal cable. The internal linear power supply is equipped with a magnetically shielded 50VA toroidal transformer or medical-grade SMPS. The pass-through transistor output stage is controlled by a low noise audio grade operational amplifier that works with minimal noise gain and from post-filtered Zener-diode reference. The close-to-perfect input noise rejection and very low output resistance rely on the bootstrapped voltage regulator architecture which is already known from our LPS and HPS power supply models. Very carefully designed 4 layers improved FR4 printed circuit board (PCB) with both sides small surface mounted components (SMD) ensures minimal signal path.

Simplified Block Diagram



PCB 3D view





SPECIFICATION		
INPUT	Connector	Neutrik NC3FAH XLR female, gold plated contact
	Ground terminal	4mm silver plated banana socket
	Load Capacitance	60pF / 180pF / 300pF / 420pF adjustable by internal DIP switches
	Load resistance	50kΩ / 5kΩ / 1kΩ / 500Ω / 100Ω / 50Ω adjustable by internal DIP switches
	Input referred noise	50nV with A-weighting & short-circuited input
	CMRR	> 100dB @ 1kHz & +72dB gain
GAIN	Amplification	+52dB / +62dB / +72dB adjustable in 3 steps by internal DIP switches
	Channel separation	> 110dB @ 1kHz
SIGNAL TO NOISE RATIO	SNR (MM cartridge)	90dBA @ $5mV_{in}$ & +52dB gain
	SNR (MC cartridge)	80dBA @ $500\mu V_{in}$ & +72dB gain
DISTORTION	THD	< 0.001%
	THD+N	< 0.01%
	IMD	< 0.01% and DFD2 < 0.001%, DFD3 < 0.01%
	SMPTE IMD	< 0.01% and MD2 < 0.001%, MD3 < 0.01%
	DIM	< 0.01%
RIAA	Time constants	3180µs / 318µs / 75 µs
	Accuracy	±0.2dB @ 20Hz – 20kHz
	Bass roll-off	6dB/octave, f_{-3dB} = 20Hz
OUTPUT	Output voltage	$17V_{eff}$ maximum
	Output impedance	100Ω
	DC error	< 2mV typical
	Connector	Neutrik NC3MAH XLR male, gold plated contact
OTHERS	Front-panel indicator	RGB LED, color and intensity adjustable in 3 steps by internal DIP switches
	Dimension	170 x 93 x 226 mm [Width x Height x Depth] (with feet)
	Weight	2.700 / 1500 grams (T50/H30)
ENVIRONMENT	Working temperature	-10 C° to +40 C°
	Working Humidity	20 to 90% RH, non-condensing
MAINS	Connector	Schurter IEC C14 inlet with integrated switch & fuse holder
	Voltage range	220-240 VAC with T50, and 80-260 VAC with H30 power supply
	Frequency	50/60 Hz
	Fuse	Schurter 1 AT (Time lag, slow), 20 x 5 mm, gold plated
	Power consumption	< 10W
PACKAGING	Material	Corrugated paper and foam
	Box content	• PHO-NR1 True Balanced Phono Preamplifier • Mains power cable, Schuko Type E/F, C13, 3x0.75mm^2, 1.5m • 4mm gold plated banana plug • 4mm gold plated banana plug with M4 thread and knurled nut • Hex Key Wrench 2mm, short
	Dimension	240 x 150 x 390 mm [Width x Height x Depth]
	Weight	3.200 / 1500 grams (T50/H30)

Settings

INPUT TERMINATION & GAIN

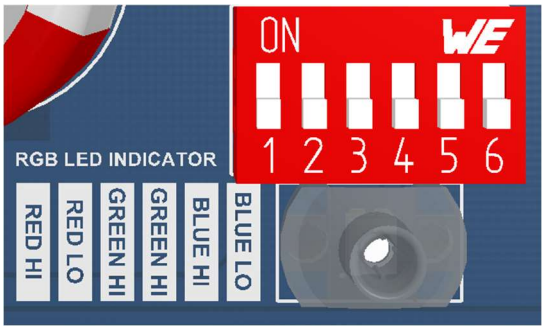
Examples of typical DIP switch settings:

- For low-output MM: only #9 is ON → load = 50kΩ + 60pF, gain = +62dB
- For low-output MC: #1, 2, 5, 10 ON → load = 1kΩ + 300pF, gain = +72dB

☝ Make sure you set the switches the same way on both channels.

Load capacitance	*DIP switch # → ON*
60pF	-
180 pF	1
300 pF	1, 2
420 pF	1, 2, 3
Load resistance	*DIP switch # → ON*
50kΩ	-
5kΩ	4
1kΩ	5
500Ω	5, 6
100Ω	7
50Ω	7, 8
Gain	*DIP switch # → ON*
+52dB	-
+62dB	9
+72dB	10

FRONT PANEL LED



☝ During output's muting front LED is blinking

Color / Intensity	*DIP switch # → ON*
RED / Low	2
RED / Medium	1
REG / High	1, 2
GREEN / Low	4
GREEN / Medium	3
GREEN / High	3, 4
BLUE / Low	6
BLUE / Medium	5
BLUE / High	5, 6
WHITE / Low	2, 4, 6
WHITE / Medium	1, 3, 5
WHITE / High	1, 2, 3, 4, 5, 6
LED OFF	-

Model encoding example: PHO-NR1-T50-BBB

- 1st digit: Front = **B**lack; 2nd digit: Case = **B**lack; 3rd digit: Back plate = **B**lack
- Power Supply Type & Wattage: T50 = Toroid 50VA or H30 = Hybrid 30W
- Generation = Numero One
- Series name = PHO (Phono)

Label