

M O O N

by SIMAUDIO

Explore New Frontiers



Technical White Paper

891

NORTH

COLLECTION

Representing the culmination of MOON's pursuit of audio perfection, the North Collection redefines excellence in audio engineering, sonic performance, materials, and manufacturing processes. Designed and manufactured in Canada, the new series features the higher level of the MOON portfolio of performance audio products.

The MOON 891 network player / preamplifier represents the pinnacle of performance, features, and construction in the North Collection. It also comprises a streaming DAC, a phono stage, and a graphic interface within the timeless exterior of the North Collection.

Using MOON's onboard MiND2 streaming platform, the 891 retrieves the finest details from digital music files. Local libraries and internet streaming services integrate seamlessly in the MiND Controller app for iOS and Android, with additional support for AirPlay, Spotify Connect, and TIDAL Connect in a Roon Ready solution. Its MDE-3 digital engine exploits a dual-mono pair of top-of-the-line 32-bit converters with femto-second clocking to realize the full potential of all two-channel digital audio formats (including PCM, MQA, and DSD) through a comprehensive set of digital input options.

The brilliant 5" colour screen on the front of the 891 displays the extensive setup menu, showcases cover art and track information, and allows volume and input selection. The unit's high-performance moving-magnet and moving-coil phono preamplifier can also be configured via the screen.

This exceptional network player/preamplifier introduces new technological innovations such as the MOON Damping Base, a mechanical system that effectively suppresses parasitic vibrations responsible for microphonic noise. Additionally, it features the M-RAY2 volume control, which boasts discrete resistors and enhanced components for optimal performance.

BRM-1 - INTELLIGENT REMOTE CONTROL

Enhancing the user experience further, the 891 is accompanied by MOON's industry-leading BRM-1 remote. Its groundbreaking touch controls, super-sharp screen, Bluetooth RF communication and exquisitely crafted aluminum MOON volume knob set a new standard in remote-control design.

DAC

The proprietary MDE-3 Digital Engine is the ultimate MOON "Digital Engine" and is employed exclusively in the flagship 891 Network Player / Preamplifier.

To address the problem of digital timing variations (jitter), the incoming signal is fully re-clocked using an in-house-programmed FPGA (Field-Programmable Gate Array) chipset. Combined with state-of-the-art precision femto-second (10-15 or one quadrillionth of a second) clocking, jitter is effectively reduced well beyond the threshold of audibility, allowing the audio signal to be reproduced unfettered by the distortion and smearing of the stereo image that is a sonic artifact of timing errors.

MDE-3 uses physically separate DACs for each channel and each one is painstakingly electronically calibrated, ensuring an extremely tight match between them and the ultimate sonic performance.

In addition, MDE-3 automatically reconfigures the DACs electronically to play music tracks of various formats, without the need for manual intervention.

Key features:

- Automatic instantaneous DAC configuration to seamlessly transition from playing one type of track format to another (i.e. PCM, MQA, DSD)
- FPGA re-clocking of incoming signal
- Dedicated high-performance regulators for clock, DAC, and analog stages
- Fully balanced DAC configuration utilizes eight (8) monaural DAC outputs per channel, summed and averaged for lower noise and distortion
- Two ES9038Pro chipsets (one dedicated to each channel)

VOLUME CONTROL

The M-RAY2 electronic gain control in the 891 is the finest, most precise, and transparent volume control ever designed by the MOON engineering team. The “Ray” stands for array, denoting that the circuit uses an R-2R network array.

The front panel rotary knob operates an optical encoder for silky, resistance-free rotational feel, precision, and long life.

Key M-RAY2 features:

- Highest precision components, including 0.1% tolerance thin film resistors
- Signal path is as direct as possible by not diverting the audio signal anywhere outside its “natural” path
- <0.1 dB difference between channels at a given volume setting
- Default: 140 steps: 0 – 20 = 1 dB steps, 20 – 80 = 0.5 dB steps
- Alternative (user setup) mode: 620 steps: 0 – 20 = 1 dB steps, 20 – 80 = 0.1 dB steps

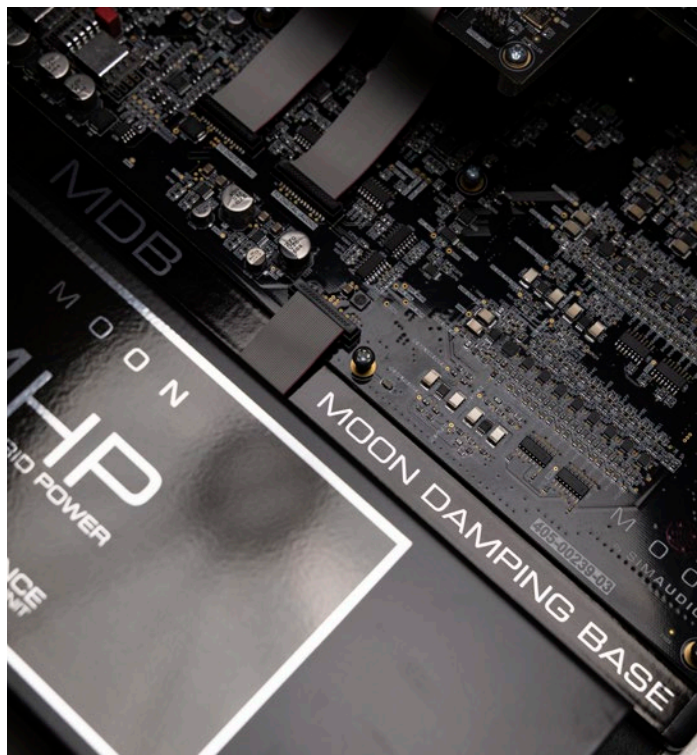
MECHANICAL ISOLATION

The 891 features the MOON Damping base (MDB), a mechanical system to suppress parasitic vibration that cause microphonics in the audio electronic circuit.

Mechanical vibration has long been known to interfere with the integrity of a music signal. The 891 features the new and proprietary MDB system (MOON Damping Base) that ingeniously addresses the issue of vibration, as well as other inherent problems at the same time.

MDB first and foremost suppresses parasitic vibration that causes microphonics in the audio circuits, which in turn reduce sonic resolution. The benefit is a more natural, organic and accurate sonic presentation.

MDB also employs a thermal phase change material that improves mechanical damping even further and promotes isothermal behaviour during heat dissipation.



This ensures that operating temperatures are maintained closer between components and consequently improves clarity and low-level information retrieval, for a more realistic and accurate stereo soundstage.

Key MDB features:

- Gel-based suspension that dissipates vibration to heat, while mechanically decoupling all analog audio circuits from the chassis (no metal-to-metal contact at all)
- Heavy-gauge aluminum base for higher moment of inertia and lower resonance
- Thermal phase change compound between analog circuit board and aluminum base further reduces microphonic effect and increases isothermal heat dissipation

MOONLink

MOONLink allows interoperability between devices in the North Collection and other future MOON products. Using a standard ethernet (RJ45) connection, MOONLink allows:

- Synchronization of parameters including Standby and display & LED brightness levels
- Volume control operation and input selection using MOON’s MiND Controller app (iOS & Android) as well as when using Roon
- Firmware updates to connected MOON devices are made possible
- Status notifications

The MOONLink connection permits a group of interconnected MOON devices to operate as if they were one unit through seamless integration. Multiple subgroups of MOON devices can be created, with each group’s devices controlled individually.

Specifications

Analog Input Impedance: 22 kΩ

Maximum Gain (Line Level): 13.5 dB

Phono Input Gain: 40 dB / 54 dB / 60 dB / 66 dB

Phono Input Capacitance: 0 / 100 pF / 470 pF

Phono Input Resistance: 10 Ω / 100 Ω / 1 kΩ / 47 kΩ

Output Impedance: 50 Ω

Crosstalk: -125 dB

Frequency Response: 2 Hz – 200 kHz (+0 dB / -3 dB)

Signal-to-Noise Ratio (Analog Preamp): 125 dB

Dynamic Range (Digital Input, Fixed Output): 125 dB

Total Harmonic Distortion + Noise: 0.0003%

Intermodulation Distortion: 0.00006%

Power Consumption (Idle): 30 W

Power Consumption (Full Power Standby): 27 W

Power Consumption (Low Power Standby): 5.5 W

Dimensions (WxHxD): 18.95x5.53x17.66 in / 48.1x14x44.9 cm

Weight: 54 lbs / 25 kg
