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# N<sup>o</sup>512

CD/SACD™ PLAYER

mark  
LEVINSON®



# N°512

## CD/SACD PLAYER

### A NEW LEVEL OF REALISM

The N°512 is the first Mark Levinson® device capable of Super Audio CD (SACD™) playback, taking recorded audio to a new level of realism for heightened listening enjoyment. It reproduces stereo SACD tracks, the stereo CD track on so-called “hybrid” Super Audio CDs and traditional CDs. Designed to be the primary disc player in any ultrahigh-quality music system, the N°512 can be connected directly to one or more power amplifiers, or to a preamplifier in a multisource system. Like all Mark Levinson products, the N°512 has been specially engineered to provide exceptional sound quality.

### ABOUT SUPER AUDIO CDS

For more than two decades, the compact disc (CD) has been widely considered to be the best available medium for music playback, but many audiophiles have been aware of the format's shortcomings from the beginning. Early CD players and discs produced a harsh, brittle sound when compared to their analog counterparts.

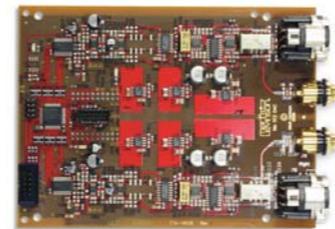
CD player design and construction improved in quality over the years, and sound quality improved with it. But as artists produced better-sounding CDs and manufacturers built better-sounding players, the sampling frequency (the speed of digital conversion) and word length (the number of bits of information used to represent an audio wave) of the CD format came to be seen as absolute barriers to further progress.

### CONSTRAINED TO A SAMPLING FREQUENCY, THE VENERABLE CD'S ONCE-IMPRESSIVE FREQUENCY RANGE AND DYNAMICS BEGAN TO SEEM LIMITED

Sony Corporation and Philips Electronics, the companies that had jointly developed the CD, joined forces again to develop the Super Audio CD. Although they bear a close physical resemblance to CDs, Super Audio CDs are quite different. They encode audio in the Direct Stream Digital™ (DSD) format with a 2.8224MHz sampling frequency and a one-bit word length, compared to a 44.1kHz sampling rate and 16-bit word length for CDs. Despite the differing word lengths, the SACD format has a bit rate that is four times that of a CD. This extra data allows the SACD format to achieve a significantly greater dynamic range and wider frequency response. In fact, Super Audio CDs are capable of delivering the entire dynamic range of live music – 120dB vs. 96dB for CDs – and extended frequency response – up to ~100kHz vs. ~23kHz for CDs. The SACD format is able to more completely capture a musical performance, drawing the listener more deeply into the experience.

### TIMING IS CRITICAL

Audio engineers know that jitter – time-based errors in a digital signal – can have significant detrimental effects on sound quality. In severe cases, jitter can cause players to output loud clicks during the music, immediately ending any illusion of a live performance. But even small amounts of jitter are audible, and jitter is present to at least some degree in every digital device. How it is managed or minimized varies widely.



DAC PCB on six-layer, high-speed Nelco® N4000-13 SI laminate. The intricate, mirror-image PCB design shows the care that was taken to place every component and trace.

In the N°512, Mark Levinson engineers devised a proprietary (and quite clever) anti-jitter technique employing a memory buffer and a Direct Digital Synthesis (DDS) circuit. After the digital stream is read and decoded by the transport, it is sent to a memory bank that stores it temporarily. The DDS circuit then accurately reclocks the output of the memory bank. By placing a buffer between the player's transport and the rest of the digital circuitry and reclocking the signal, any jitter introduced by the transport itself is effectively removed, and the remainder of the digital path is slaved to the master clock. This ensures that jitter is kept to a minimum, and that there is only one clock controlling the internal timing of digital signals.

### THE D/A CONVERSION PROCESS

A critical design element in any digital device is the digital-to-analog (D/A) conversion process. In the N°512, extremely high-quality 24-bit D/A converters are used in differential or dual mode. In other words, each channel utilizes two D/A converters instead of one. This is a more costly design solution, but it yields significantly better signal-to-noise ratio and dynamic range, revealing more of the music playing through the device. In addition, the D/A converters themselves are equipped to convert DSD-encoded audio from Super Audio CDs in the native format, avoiding any degradation that could be caused by converting the signal to accommodate D/A converters that are not DSD-capable. By avoiding this conversion step, the analog output much more closely matches the original signal on the disc.

### DESIGN DETAILS

To preserve the purity of audio output, the N°512 has two separate power supplies with independent, custom-designed, high-quality, toroidal transformers. One power supply is dedicated to the digital circuitry and the other to the analog circuitry. Having completely independent power supplies safely isolates the delicate analog circuits from any potential noise or interference generated by the digital circuits, which would be detrimental to audio quality. Mark Levinson engineers have also completely enclosed the analog output board in a separate metal subenclosure, and physically placed inherently noisy components as far away from it as possible. The analog signal is available on balanced or unbalanced outputs. There are also AES and S/PDIF digital outputs for sending PCM digital signals from conventional CDs to other devices. In addition, the N°512 features a metal loader assembly, for greater durability.

### CONTROL AND SYSTEM OPTIONS

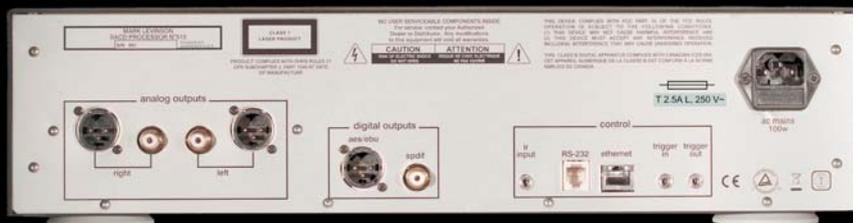
The product was designed for use in systems where it can be connected to a preamplifier, or directly to the power amplifier(s) if it is the only system source. Although a direct connection precludes the convenience of the source switching that is offered by most preamplifiers, it eliminates one component (and the possible degradation it can cause) from the audio path. A heavy-duty metal, wireless remote control that provides a full complement of controls is included. The N°512 also includes several other options for control, including RS-232, Link2 and MLNet. RS-232 is compatible with third-party controllers, such as those available from Crestron Electronics, Inc. And the Link2 and MLNet protocols facilitate communication with other compatible Mark Levinson products.

### ANOTHER MARK LEVINSON FIRST

The N°512 is the first dedicated high-resolution playback source device to carry the Mark Levinson name. In addition to unlocking the impressive dynamics of the SACD format, the N°512 is designed to extract the very best from your existing CD collection. There's no doubt that the N°512 will open a new world of listening enjoyment.



Main PCB, featuring separate analog and digital toroidal power transformers. Oversized, extruded heatsinks for each individual voltage allow the system to run cool.



## No. 512 CD/SACD™ PLAYER

<b>Output connectors</b>	Two balanced XLR analog outputs Two single-ended RCA analog outputs Two digital outputs – one AES (XLR) and one S/PDIF (RCA)
<b>Control connectors</b>	One Ethernet port One RS-232 port One IR port, 3.5mm mono mini plug One 3.5mm mono (tip/sleeve) mini plug trigger input, 12V One 3.5mm mono (tip/sleeve) mini plug trigger output, 12V Three-pin IEC standard power connector
<b>Frequency response</b>	+0.0dB/–0.2dB PCM/CD +0.0dB/–0.5dB DSD/SACD
<b>Signal-to-noise ratio</b>	108dB
<b>Dynamic range</b>	108dB
<b>Total harmonic distortion</b>	92dB PCM/CD 99dB DSD/SACD
<b>Decodable formats</b>	CD and SACD
<b>Fixed output level</b>	4V (balanced), 2V (single-ended)
<b>Max. output level</b>	16V (balanced), 8V (single-ended)
<b>Output impedance</b>	10 Ohms
<b>Power requirements</b>	100/120/220/230 – 240V~, 100W, 50/60Hz, factory-set for destination country
<b>Dimensions (H x W x D)</b>	4-9/16" x 17-3/8" x 17-5/8" (116mm x 442mm x 448mm)
<b>Weight (net)</b>	32.5 lb (14.7kg)
<b>Operating environment</b>	Operating temperature: +5° to +35°C (41° to 95°F) Storage temperature: –20° to 55°C (–4° to 131°F) Operating humidity: 5% to 80% noncondensing

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