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## Bulletin 0416

### Development Overview

# The Spectral SDR-4000SV Reference CD Processor System

The SDR-4000SV Reference CD Processor is a limited edition reference instrument crafted in the Spectral engineering department and individually programmed and calibrated by its designer Keith Johnson. Relatively unlimited time and resources have been utilized to achieve our ultimate objective: Engineer the most sophisticated and sonically accurate CD player in the audio industry. Those that are familiar with Keith Johnson's credentials and previous achievements in digital design know this objective is not taken lightly.

As with previous editions of our SDR components from the 1980s and 1990s, such as the SDR-1000 and SDR-2000 reference digital components, it takes our engineers multiple design generations to arrive at an ultimate model. The SDR-4000 has been previously produced in three highly regarded versions, the original SDR-4000S, the revised SDR-4000Pro which incorporates the exclusive HDCD "Long Filter" technology and the SDR-4000SL with our Ultradrive system. It has taken Spectral engineers five additional years to develop our most uncompromising generation, the SDR-4000SV. In the SDR-4000SV, Keith Johnson and the design team address the continuing performance objective to create the ultimate SDR-4000 and again redefine the possibilities of the compact disc medium for the most demanding musical applications.

### **The Spectral SV Technology Delivers Superior Analog Performance**

Constant research in our fundamental technologies drives component advancement at Spectral. When we introduced our recent SHHA Generation 3 line section modules in the DMC-30SV reference preamp, they proved to be a game changer. Our customers and our dealers proclaimed the DMC-30SV a "revelation", redefining preamplifier performance in the finest music systems. Now the "Super Veloce" technology is adopted for the high-level output section of the new SDR-4000SV CD processor with exceptional results.

In reality, all digital source components are a complex combination of systems and as much dependent on the quality of analog circuits as digital. This awareness of analog's critical role has driven Spectral digital design practice to focus the same demanding performance criteria we use in developing our preamplifier line sections. In the SDR-4000SV the line amplifiers and power supplies are replicated from the uncompromising DMC-30SV reference preamp. In all probability, there may not be a more sophisticated analog output section in a digital component today! However, there is more that is required to surpass our previous analog efforts. A newly designed DAC summation I/V amplifier is optimized to support the higher speed and gain of the the SV output section. The hand-calibrated passive equalizer filter section is also realigned. Taken in total, the fully discrete high-speed class A amplifier topology of the SDR-4000SV takes analog performance to a new level in a digital component.

### **Spectralock 2 Delivers Superior Clocking**

The analog amplification improvements are not the only advances made in the SDR-4000SV, a new proprietary clocking system reduces jitter and clock

error to previously unattainable levels. Our new Spectralock 2 system employs custom cut VCXO crystal reference oscillators and redesigned master clock system to lower clock jitter and reduce fields which can induce jitter. This extreme precision has resulted in virtually unmeasurable peak jitter using the finest existing instrument test systems. The ultra-precision Spectralock 2 master clock is joined by new drive control software which increases data cache rate and suspends data transmission from the drive to DAC for longer periods of zero activity. This silent transport running lowers noise and field emissions. The results of these changes are lower clock interference and lower electrical activity which can effect the internal timing of the DAC.

### **Spectral SDR-4000SV is the Industry's Finest CD Playback System**

The industry leading performance achieved by the first SDR-4000 twelve years ago continues with the advancements of the SDR-4000SV today. No other digital component for CD playback approaches the challenges of 44.1 digital with the technical and design superiority realized in the SDR-4000SV. This superiority starts with a fundamental architecture dividing 4000 structure into eight fully independent and powered digital and analog sub-systems. Each sub-system has been realised with breakthrough technology and componentry using "best practices" employed in SOTA high-technology instrumentation. With zero cost-cutting and the finest components in existence, benchmark performance in 44.1 reproduction has been achieved. The addition of the new SV technology and Spectralock 2 master clock reference to the SDR-4000 result in the finest performing CD playback system in the industry, delivering unrivaled performance of music recorded on compact disc.