Accuphase

PRECISION SA-CD TRANSPORT

DP-950

PRECISION MDSD DIGITAL PROCESSOR

DC-950

■ DP-950: Digital-only SA-CD/CD transport ● High-rigidity, high-precision SA-CD/CD drive ● Accuphase original digital interface: HS-LINK
■ DC-950: Digital processor with revolutionary SA-CD reproduction technology MDSD ● MDS++ type D/A converter with 8 circuits driven in parallel ● "Direct Balanced Filter" with totally separate line and balanced signal paths ● Eight inputs including HS-LINK and USB

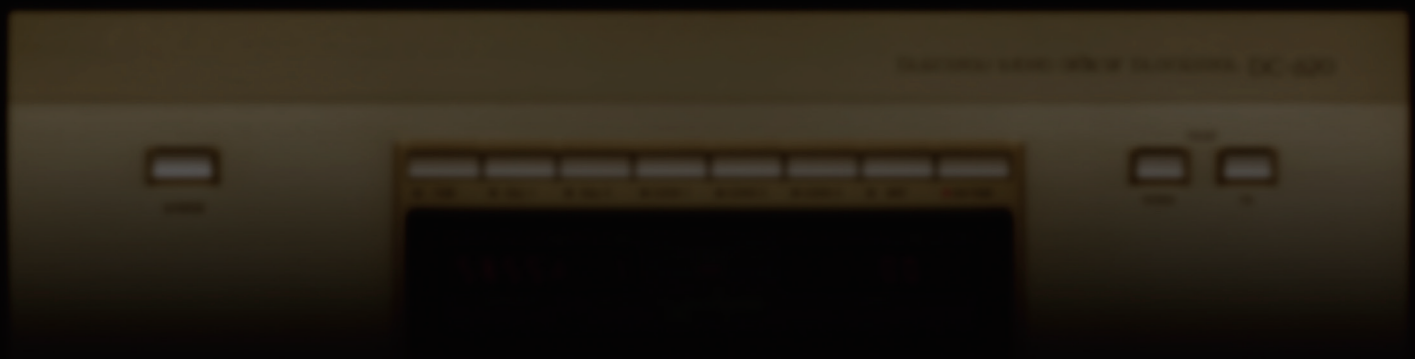
The Pinnacle of Perfection

DP-950

PRECISION SA-CD TRANSPORT

The centerpiece of the DP-950 is its ultra-massive SA-CD/CD drive with highly rigid, high-precision construction. This is complemented by an ultra-strong power supply featuring two high-efficiency toroidal transformers and an array of filtering capacitors. The result is an SA-CD/CD

The Shape of the Future



DC-950

PRECISION MDSD DIGITAL PROCESSOR

The DC-950 is the ultimate digital processor using only specially selected materials and advanced digital technology. Glass fluoro-carbon resin PCBs and completely separate power transformers for digital and analog circuitry assure peerless performance that

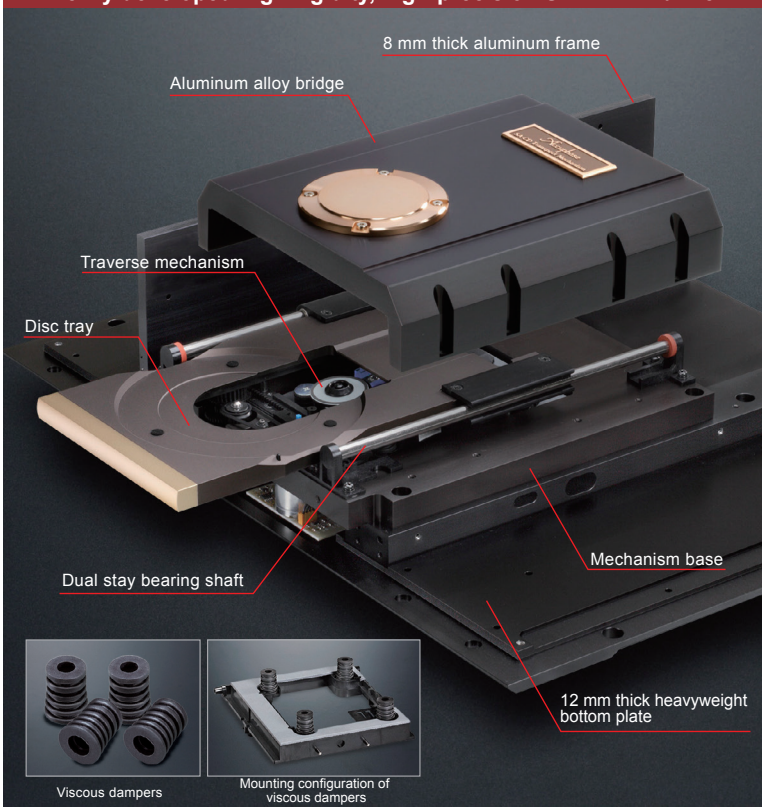
DP-950

PRECISION SA-CD TRANSPORT

The Technology of Precision

The supreme heavy-weight SA-CD/CD transport — The ultra-massive drive mechanism is machined with utmost precision, and the highly rigid construction with low center of gravity eliminates any unwanted vibrations. A luxurious disc tray is linked to an utterly quiet and smooth loading mechanism. Support for the digital audio interface HS-LINK Ver. 2 ensures accuracy on a level that far surpasses earlier standards, allowing the separate transmission of clock and data signals for enhanced purity. The DP-950 ushers in a new era of information fidelity, fully bringing out the enormous amount of musical detail stored on high-quality digital media.

Newly developed high-rigidity, high-precision SA-CD/CD drive



External vibrations reliably blocked by super-massive sturdy chassis Highly rigid and precise construction

The SA-CD/CD drive is mounted firmly to a strong aluminum frame, and the drive loading mechanism and mechanical base form a massive and highly rigid chassis of considerable weight (total 11.7 kg). Conversely, the traverse mechanism, an integrated structure consisting of the optical assembly including laser pickup and rotating parts, is designed for extremely light weight, and isolated from the loading mechanism by a floating suspension arrangement. A large, super-heavy bridge machined from a single block of aluminum is joined to the mechanism base to form an integrated structure.

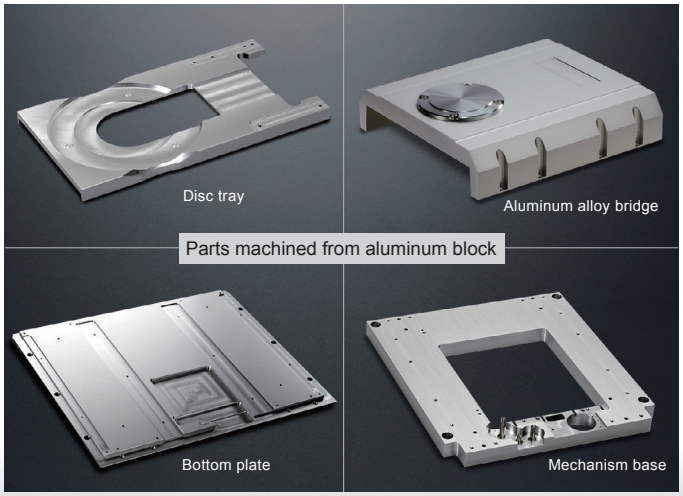
"Traverse Mechanism" with 4-point floating design and viscous dampers

Integrated construction with large heavyweight aluminum alloy bridge mounted to mechanism base

High-quality disc tray extruded from an aluminum block

Super-quiet smooth disc loading mechanism featuring dual stay configuration for steel bearing shafts

Low center of gravity to further control and reduce vibrations



Remote commander RC-120 supplied with DP-950

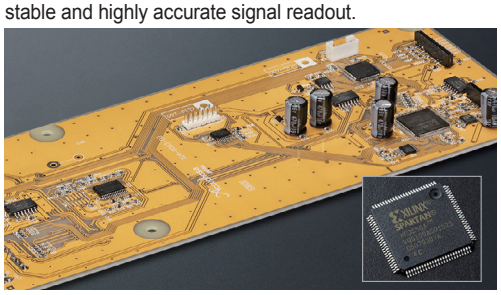
Controls DP-950 functions such as direct play, repeat, etc.

Also controls DC-950 functions such as input switching and output level adjustment, and can serve for volume control of Accuphase amplifiers.

Taking Audio Development to the Next Level

Dedicated digital output only SA-CD/CD transport for highly accurate signal pickup

A digital servo system with a dedicated DSP for control of the optical pickup and the various motors allows optimized operation for SA-CD and CD media respectively, assuring stable and highly accurate signal readout.

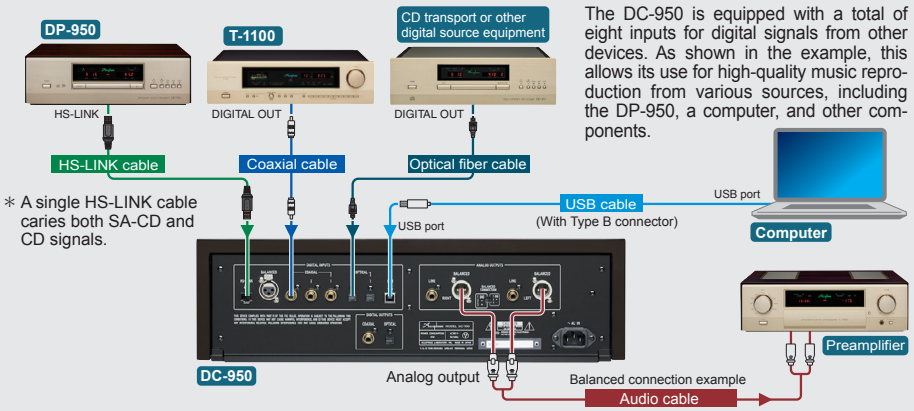


Single-lens/twin laser diode pickup handles the 650 nm wavelength (SA-CD) and 780 nm (CD) with dedicated diodes for reliable high-speed access

Strong power supply with high-efficiency toroidal transformers and custom-made filtering capacitors

Two separate high-efficiency toroidal transformers in conjunction with ten specially made high-quality filtering capacitors (4,700 µF/35 V) are used to separately power the SA-CD/CD drive mechanism and the signal processing section. The result is a perfectly stable digital signal of high accuracy.

DP-950 and DC-950 connection example



The DC-950 is equipped with a total of eight inputs for digital signals from other devices. As shown in the example, this allows its use for high-quality music reproduction from various sources, including the DP-950, a computer, and other components.

Advanced Features

Support for HS-LINK Ver. 2 means that clock and data signals can be transmitted separately for direct input of a high-purity signal to the D/A converter, resulting in a drastic improvement in performance and quality.

High-quality playback of CD media as well

The sophisticated SA-CD signal processing technology of the DP-950 also benefits conventional CD media, allowing highly accurate signal readout for playback with excellent quality.

Support for playback of DSC discs with DSF file format

Easy to read display

The 7-segment display is larger than earlier displays of this type, for improved readability. ∗ Text display is not supported.

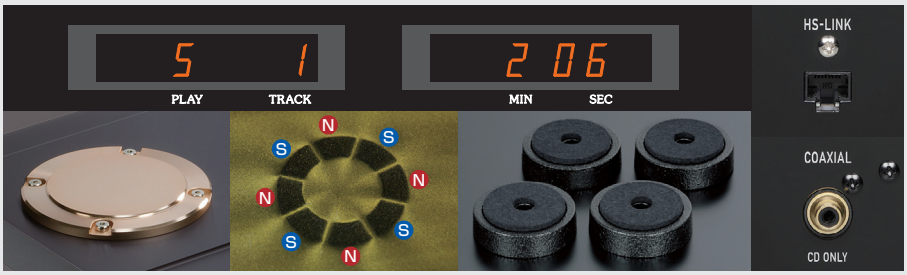
Chucking magnet using neodymium is designed to firmly and evenly hold the disc to prevent wobble

The 8-pole magnetized yoke of the magnet ensures uniform force to securely clasp the turntable and the disc to prevent disc wobble.

One RJ-45 output (HS-LINK) for SA-CD and CD, and one dedicated coaxial output for CD

Advanced High Carbon cast iron insulator feet with superior damping characteristics further enhance sound quality

Visually stunning cabinet made of carefully selected



About HS-LINK Ver. 2

HS-LINK Ver. 2 is a further elevated version of the Accuphase HS-LINK interface, providing significantly expanded sampling frequency and quantization support up to 5.6448 MHz/1-bit 2-channel DSD and 352.8 kHz and 384 kHz/32-bit 2-channel PCM. ● The DC-950 can reproduce both HS-LINK (Ver. 1) and HS-LINK Ver. 2 signals.

	HS-LINK (Ver. 1)	HS-LINK Ver. 2
Sampling frequencies	32.0 kHz, 44.1 kHz, 48.0 kHz, 88.2 kHz, 96.0 kHz, 176.4 kHz, 192.0 kHz / 16 to 24-bit 2-channel PCM	32.0 kHz, 44.1 kHz, 48.0 kHz, 88.2 kHz, 96.0 kHz, 176.4 kHz, 192.0 kHz, 352.8 kHz, 384.0 kHz / 16 to 32-bit 2-channel PCM
Number of bits	2.8224 MHz / 1-bit 2-channel DSD	2.8224 MHz, 5.6448 MHz / 1-bit 2-channel DSD

- Capability to carry the SA-CD signal as well as conventional digital audio signals
- Transfer rate: min. 400 Mbps (logical limit 1923 Mbps)
- Transfer signal format: Low Voltage Differential Signal-

DC-950

PRECISION MDSD DIGITAL PROCESSOR

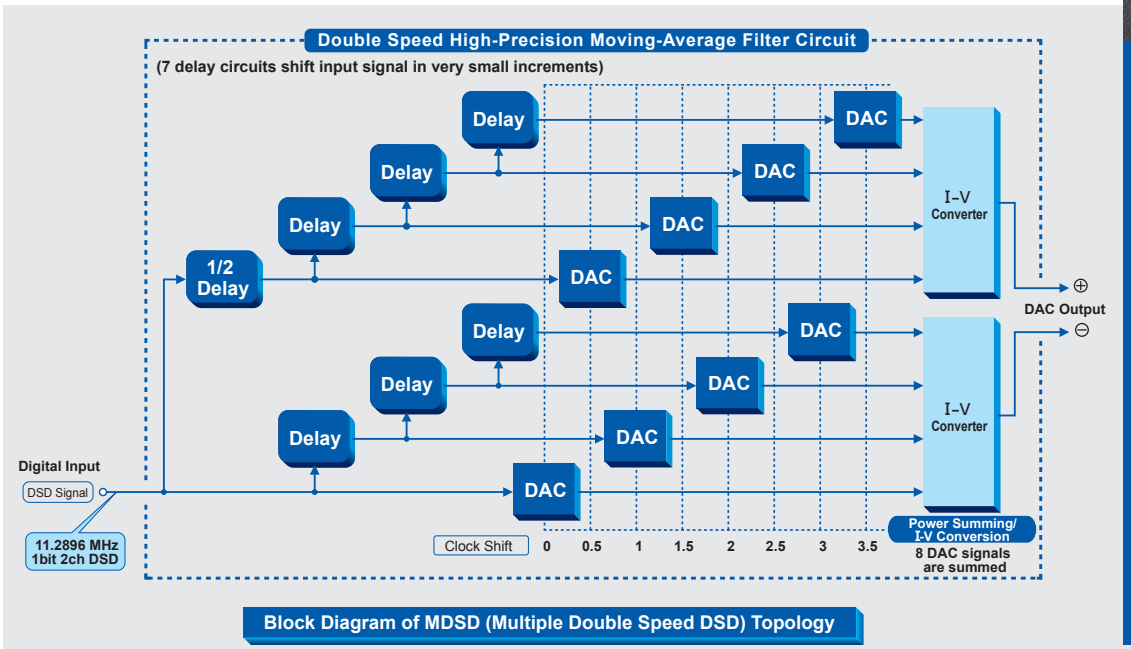
A digital processor that redefines the state of the art — Digital signal processing is implemented through an ultra-high-speed FPGA in conjunction with innovative MDSD reproduction technology, forming a double-speed high-precision moving-average filter circuit for straight D/A conversion of the DSD signal. Eight digital inputs including USB with support for 11.2896 MHz (1-bit 2-channel DSD) and 384 kHz (32-bit 2-channel PCM), as well as an HS-LINK connector (Version 1 and 2) provide enhanced versatility for the ultimate in performance and sonic purity.

Innovation Meets Accuracy

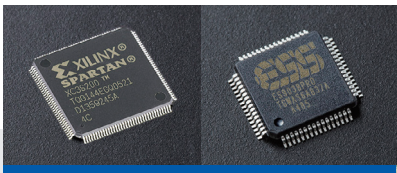
Ground-breaking digital processing: MDSD (Multiple Double Speed DSD) with support for 11.2896 MHz (1-bit 2-channel DSD)

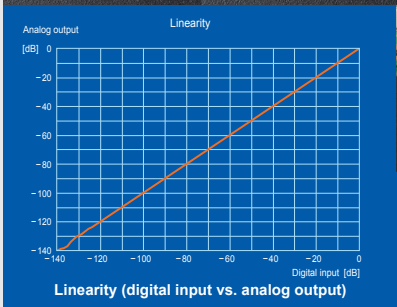
The DSD signal by principle contains quantization noise components which rise drastically outside the range of human hearing and which must be removed. In conventional designs, a digital filter inserted before the D/A converter serves to cut the noise, and an analog filter with a gentle slope setting is then used after the converter to derive the analog output. The DC-950 by contrast takes a completely different approach. An FPGA (field-programmable gate array) is used in the digital processing section, together with a moving-average filter circuit for clock shifting. This innovative MDSD reproduction circuit topology is capable of highly effective noise removal. A major advantage is the fact that conversion errors in the D/A stage are kept extremely small, while the high-cut filter function is already integrated in the circuit.

- **High-cut filter function reliably removes signal components outside the range of human hearing (almost exclusively noise components).**
- **Conversion errors that could affect signal components in the range of human hearing are minimized, similar to MDS.**

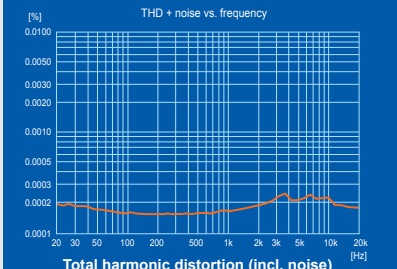


Block Diagram of MDSD (Multiple Double Speed DSD) Topology





Linearity (digital input vs. analog output)

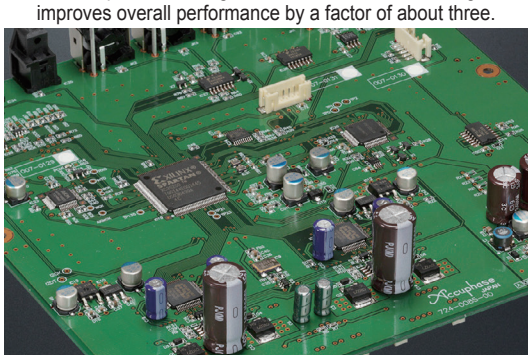


Total harmonic distortion (incl. noise) vs. frequency response

Excitement That Lasts Forever

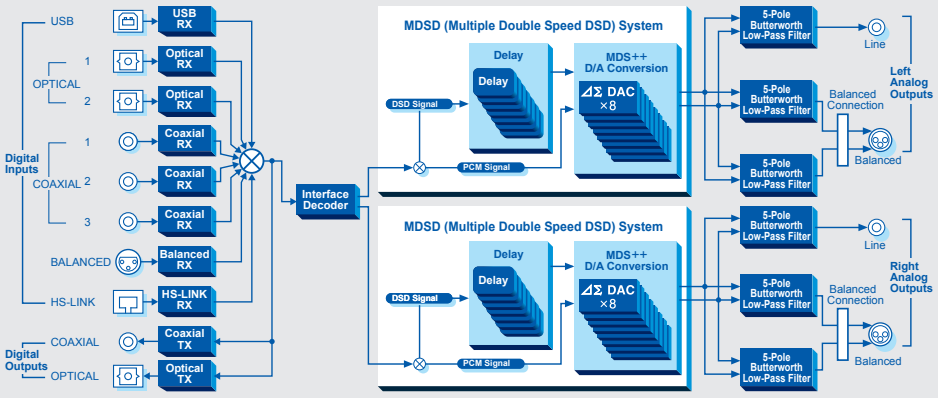
MDS++ type D/A converter with 8 parallel circuits and support for 384 kHz (32-bit 2-channel PCM)

The super-advanced MDS++ type D/A converter used in the DC-950 was developed to further push the envelope, resulting in breathtaking performance and PCM signal reproduction of the highest order. Pioneering the application of the latest 32-bit Advanced Hyperstream™ DAC chip (ES9038PRO) from ESS Technology Inc., a solution for driving eight circuits in parallel was successfully implemented. Compared to a single converter circuit, this arrangement improves overall performance by a factor of about three.



Strong power supply with high-efficiency toroidal transformers and array of custom-made filtering capacitors

Two separate highly efficient toroidal transformers in conjunction with specially made high-quality filtering capacitors (total 80,000 µF) are used to separately power the digital and analog sections.



DC-950 Block Diagram

Advanced Features

Easy to read display

The 7-segment display is larger than earlier displays of this type, for improved readability.

Display can show sampling frequency and number of quantization bits

Filter amplifier printed circuit board made from glass cloth fluorocarbon resin with low dielectric constant and minimum loss

Digital level control allows adjustment down to −80 dB.

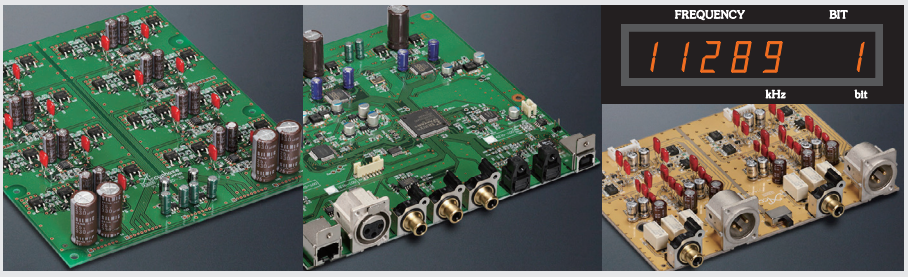
The level control employs the digital principle for optimum accuracy and minimal degradation of sound quality. Integration of the level control function in the D/A converter prevents noise and provides a wide adjustment range down to −80 dB.

Balanced connectors to shut out external noise interference
Phase selector for balanced output

Versatile array of inputs including HS-LINK (Version 1 and 2), BALANCED, COAXIAL x 3, OPTICAL x 2, and USB

One COAXIAL and one OPTICAL digital output

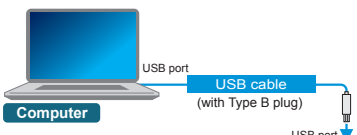
Advanced High Carbon cast iron insulator feet with superior damping characteristics further



I/V amplifier assembly | DAC assembly | Filter amp assembly

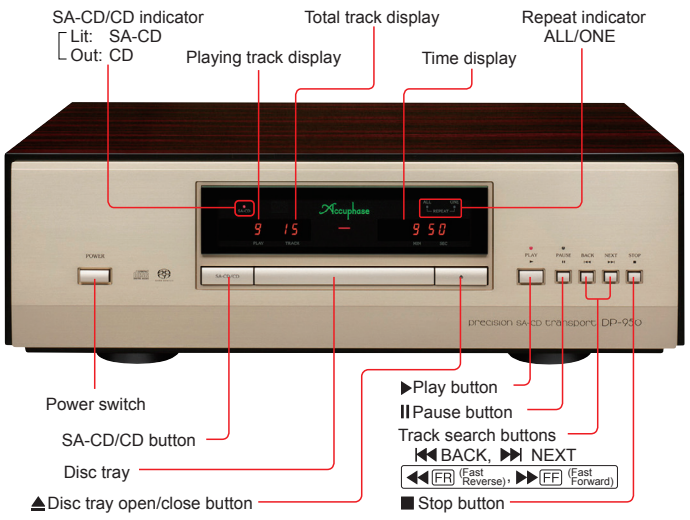
Using USB cable to connect a computer

The DC-950 is equipped with a USB port (Type B). This allows a computer with a music library to be connected via a USB cable (with Type B plug), for playback of high-resolution music data up to a sampling frequency of 384 kHz/32-bit or 11.2896 MHz (1-bit DSD) with high quality.

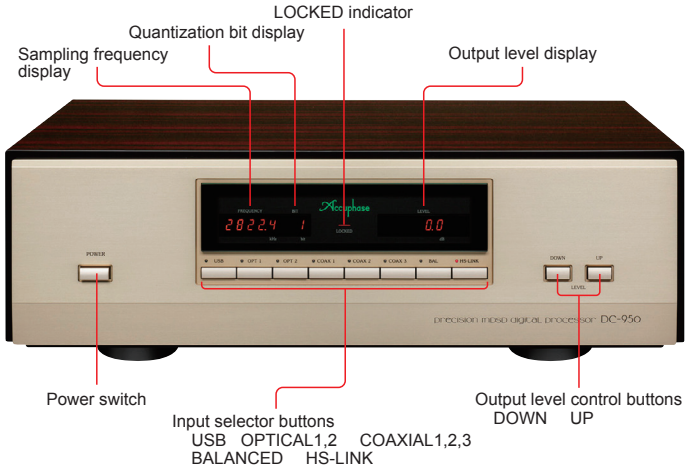


* Before using the USB port, install the suitable software for the computer from the supplied USB Utility 2 CD-ROM.
* Playback of music data via the USB link is dependent on the operating system and music playback software of the computer.
* For information on USB settings and connection, refer to the documentation of the computer.

DP-950 Front Panel

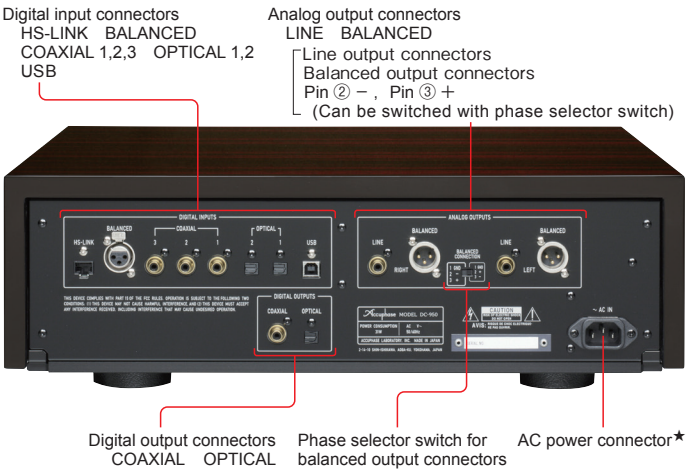


DC-950 Front Panel



DP-950 Rear Panel

DC-950 Rear Panel



DP-950 Guaranteed Specifications

∗ Guaranteed specifications measured according to JEITA standard CP-2402A

Compatible disc formats
- 2-channel SA-CD (Super Audio CD)
- DSD disc (DSF file format)
- CD

Data read principle
Non-contact optical pickup

Laser diode wavelength
- SA-CD: 650 nm
- CD: 780 nm

Digital outputs
- HS-LINK
  - Connector type: RJ-45
  - Suitable cable: dedicated HS-LINK cable
  - SA-CD
    - Ver. 1, Ver. 2: 2.8224 MHz / 1 bit DSD
    - CD: 44.1 kHz / 16-bit PCM
- COAXIAL
  - Format: IEC 60958 compliant
  - CD: 44.1 kHz / 16-bit PCM

Power requirements 120 V, 220 V, 230 V AC, 50/60 Hz (voltage as indicated on rear panel)

Power consumption 16 W

Maximum dimensions
Width 477 mm (18.8 in)
Height 156 mm (6.1 in)
Depth 394 mm (15.5 in)

Weight 30.6 kg (67.5 lbs) (with batteries)
38.0 kg (83.8 lbs) in shipping carton

DC-950 Guaranteed Specifications

∗ Guaranteed specifications measured according to JEITA standard CP-2402A

Digital inputs
- HS-LINK
  - Connector type: RJ-45
  - Suitable cable: dedicated HS-LINK cable
- BALANCED
  - Format: IEC 60958/AES3 compliant
  - Suitable cable: 110 ohm digital balanced cable
- COAXIAL
  - Format: IEC 60958/AES3 compliant
  - Suitable cable: 75 ohm coaxial digital cable
- OPTICAL
  - Format: JEITA CP-1212 compliant
  - Suitable cable: JEITA standard optical fiber cable
- USB
  - Format: USB 2.0 High Speed (480 Mbps compliant)
  - Suitable cable: USB 2.0 cable

Supported sampling frequencies
- HS-LINK (HS-LINK Ver. 2)
  - 32 kHz to 384 kHz (16 to 32-bit 2-channel PCM respectively)
  - 2.8224 MHz, 5.6448 MHz (1-bit 2-channel DSD)
- BALANCED, COAXIAL
  32 kHz to 192 kHz (16 to 24-bit 2-channel PCM respectively)
- OPTICAL
  32 kHz to 96 kHz (16 to 32-bit 2-channel PCM respectively)
- USB
  - 44.1 kHz to 384 kHz (16 to 32-bit 2-channel PCM respectively)
  - 2.8224MHz, 5.6448 MHz, 11.2896 MHz (1-bit 2-channel DSD)
  (11.2896 MHz: ASIO only)

Digital outputs
- COAXIAL Format: IEC 60958 compliant
- OPTICAL Format: JEITA CP-1212 compliant

D/A converter	8 MDSD principle (DSD signal) 8 MDS++ principle (PCM signal)
Frequency response	0.5 to 50,000 Hz +0, –3 dB
Total harmonic distortion	0.00045% (20 to 20,000 Hz)
Signal-to-noise ratio	122 dB
Dynamic range	119 dB
Channel separation	120 dB (20 to 20,000 Hz)
Output voltage and impedance	BALANCED: 2.5 V 50 ohms, balanced XLR type LINE: 2.5 V 50 ohms, RCA phono jack
Output level control	0 dB to –80 dB (digital)
Power requirements	120 V, 220 V, 230 V AC, 50/60 Hz (voltage as indicated on rear panel)
Power consumption	31 W
Maximum dimensions	Width 477 mm (18.8 in) Height 156 mm (6.14 in) Depth 393 mm (15.5 in)
Weight	24.2 kg (53.4 lbs) net 31.0 kg (68.3 lbs) in shipping carton

Supplied with DP-950
- **Remote Commander RC-120**
- **AC power cord**
- **HS-LINK cable AHDL-15**
- **Cleaning cloth**

Supplied with DC-950
- **AC power cord**
- **Audio cable ASL-10 with plugs**
- **USB Utility 2 CD**
- **USB Utility 2 Setup Guide**
- **Cleaning cloth**

Optional HS-LINK cable (supplied with DP-950)
- ● **AHDL-15** (1.5 m)
- ∗ **AHDL-30** (3.0 m) available by special order

Remarks
★ *This product is available in versions for 120/220/230 V AC. Make sure that the voltage shown on the rear panel matches the AC line voltage in your area.*
★ *The 230 V version has an Eco Mode that switches power off after 120 minutes of inactivity.*
★ *The shape of the AC inlet and plug of the supplied power cord depends on the voltage rating and destination country.*

Accuphase