SONY

# PCM-D1

## Digital Linear PCM Recorder

## Overview

The PCM-D1 portable audio recorder is ideal for capturing live musical and theatrical performances, or for journalists recording in the field. Features include 96 kHz-24 bit recording capability, 4GB internal Flash Memory, removable Memory Stick Pro High-Speed storage (optional) and a built-in USB port compatible with Macintosh® and Windows®/PC operating systems. The PCM-D1 is lightweight, free of all drive mechanisms, equipped with highly sensitive electret condenser microphones, and designed with circuits that process stereo sound with virtually no extraneous noise. The body of this portable recorder is made of pressed titanium that's ten times harder than alumite-treated aluminium.

**Portable and rugged 96 kHz - 24 bit recorder**

The PCM-D1 provides high quality recording in a rugged go anywhere package.

**Ideal for creating superior high-quality stereo recordings**

The compact size of the PCM-D1 makes it hugely versatile and belies its recording power.

**Offers solid-state storage - free of drive mechanisms**

The PCM-D1 has no drive mechanism so provides the reliability required when capturing that critical recording.

**High quality built-in X-Y configuration electret condenser microphones.**

The PCM-D1's electret condenser microphones have extraordinarily high sensitivity and low noise characteristics.

**USB 2.0 mass storage device - easily connects with both PC or Mac**

Connection to a PC or Mac could not be easier and provides for fast file transfer.

## Features

**Built-in Electret Condenser Microphones**
The PCM-D1's electret condenser microphones have extraordinarily high sensitivity and low noise characteristics. All the microphone casing parts fit together nearly seamlessly and are adjusted with 100-micron level precision. With a frequency response of nearly 30 kHz, the microphones are positioned using an X-Y pattern and then angled toward each other with the left and right diaphragms close together, covering a wide sound range with reduced phase shifts. The result is rich audio with a natural sounding stereo image, good depth, and perspective.

**Superb Audio Signal Path**
The microphone amplifier provided for each channel is the Analog Devices, Inc. AD797, which boasts ultra-low noise and distortion. A variable gain circuit is adopted for amplitude control, which enhances the actual signal-to-noise ratio. The line amplifier provided for each channel is the Analog Devices AD8672. Analog and digital circuits are mounted on separate circuit boards and also separately powered to help prevent interference between circuit blocks. The analog circuit achieves superb linearity so that the recorded sound is output faithfully.

**Outstanding Construction Quality**
The circuitry of the PCM-D1 recorder is protected by a body made of 1 mm thick, pure titanium and covered with nitrate titanium, scratch resistant coating - resulting in a finished titanium surface approximately ten times as hard as that of alumite treated aluminium. In addition, a distinctive arch-shaped polished stainless steel frame is provided to protect the microphones from impact damage. This rugged exterior protects the PCM-D1's circuits and microphones and enhances the high sonic quality of the recorder.

**Simple Uploading to Computer**
The PCM-D1 recorder conforms to the USB 2.0 Mass Storage Device standard. Because the recorder's native recording file format is .WAV, recordings can be rapidly uploaded to a computer and used in conjunction with most common audioproduction software.

**High Quality Signal Processing**
The PCM-D1 recorder offers comprehensive signal processing features for location recording including a unique limiter function, a 200 Hz high pass filter and SBM (Super Bit Mapping) noise shaping. With the High Pass Filter enabled, audio below 200 Hz is filtered out and not recorded. This function can be used to reduce noise caused by external sources such as wind, the flow of air-conditioning equipment, etc. With the SBM function enabled (optionally used for 16-bit recording modes), Super Bit Mapping significantly increases the dynamic range acoustically by reducing noise that is particularly easy to hear within the human audible band. To improve the audio quality when converting 20-bit data into 16-bit, the top bits of information within the lower data (usually discarded when recording in 16-bit mode) are integrated into the 16-bit data track by shifting audible noise up into an inaudible higher frequency range.

**Digital Limiter**
The digital limiter uses an independent audio buffer that contains audio 20dB lower then the audio processed in the normal recording signal path. With the PCM-D1 limiter enabled, when a loud sound suddenly occurs during recording, the over level part of the sound is automatically set within the range of the maximum input level (from the alternative -20dB buffer) in order to help prevent distortion. While this limiter function won't compensate for clipping of audio that is suddenly in excess of 20 dB, the sonic purity of the recording is fully maintained without the need to apply conventional limiter signal processing techniques.

**High Pass Filter**
With the High Pass Filter enabled, audio below 200 Hz is filtered out and not recorded. This function can be used to reduce noise caused by external sources such as wind, the flow of air-conditioning equipment, etc

**Super Bit Mapping**
Super Bit Mapping significantly increases the dynamic range acoustically by reducing noise that is particularly easy to hear within the human audible band. To improve the audio quality when converting 20-bit data into 16-bit, the top bits of information within the lower data (usually discarded when recording in 16-bit mode) are integrated into the 16-bit data track by shifting audible noise up into an inaudible higher frequency range.

## Specifications

| Generic Specifications | |
|---|---|
| Built in Microphones | Electret condenser microphones mounted in X-Y configuration. High sensitivity (-32.0 dB /Pa 1 kHz); Maximum input level 130 dB SPL; Self noise level 20 dBSPL(A) |

| Generic Specifications | |
|---|---|
| Recording Media | Built-in flash memory 4 GB, Memory Stick PRO (High Speed) media (Not Supplied), Stereo Recording |
| Sampling Rates | 22.05 kHz, 44.1 kHz, 48 kHz and 96 kHz |
| Quantization | 16-bit linear, 24-bit linear |
| Frequency Response (Line Input to Line Output) | For Fs = 22.05 kHz: Frequency Response = 20 Hz to 10 kHz; For Fs = 44.1 kHz: Frequency Response = 20 Hz to 20 kHz; For Fs = 48 kHz: Frequency Response = 20 Hz to 22 kHz; For Fs = 96 kHz: Frequency Response = 20 to 44 kHz |
| Signal-to-Noise Ratio (Line Input to Line Output) | 96 dB or greater (1 kHz IHF-A) when set to 24-bit |
| Total Harmonic Distortion (Line Input to Line Output) | 0.008% or below (1 kHz, 22 kHz LPF) |
| Wow and Flutter | Below measurable limit (less than +/-0.001% W.Peak) |
| Mic Input (Stereo Mini Jack) | Input impedance: 22 k ohm, Rated input level: 2.5 mV; Minimum input level: 0.7 mV |
| Headphone Output (Stereo Mini Jack | Rated output level: 400 mV; Maximum output level: 30 mW + 30 mW or more; Load impedance: 16 ohms |
| Line Input (Stereo Mini Jack) | Input impedance: 47 K ohms; Rated input level: 2.0V; Minimum input level: 570 mV |
| Line Out/Optical Digital Output | For Line Output Use = Output impedance: 220 ohms;(Combination Stereo Mini and Optical Output Jack) Rated output level: 1.8V;Load impedance: 22 k ohm. For Optical Digital Output Use = Output level: -21dBm to -15 dBm; Emission wavelength: 630 nm to 690 nm |
| DC Input Jack | 6 Volts |
| USB Connection | Hi-speed USB, Mass Storage Class;System requirements: Macintosh® OS Version 10.2.8 or later;Windows®/PC OS Windows XP Media Center Edition 2005 and 2004,Windows XP Professional, Windows XP Home Edition, Windows 2000Professional (SP3 or later) |
| Memory Stick Slot | Memory Stick PRO (High Speed) media;NOTE: Standard Memory Stick media not supported |
| Power Requirements | DC IN 6V (AC 220-240V, 50Hz); Four AA size nickel metal hydride rechargeable batteries NH-AA (supplied); or Four AA size alkaline batteries (not supplied) |
| Power Consumption | 2.1W |

## Generic Specifications

| | |
|---|---|
| Dimensions | 2 7/8" x 7 5/8" x 1 5/16" (w x h x d) not including projecting parts and controls |
| Weight | 18.52 oz (including batteries) |
| Approx battery life | • Nickel metal hydride rechargeable batteries @ 96KHz - 24bit = 4 Hours<br>• Nickel metal hydride rechargeable batteries @ 44.1KHz - 16bit = 5 Hours<br>• AA size alkaline batteries @ 96KHz - 24bit = 2 Hours<br>• AA size alkaline batteries @ 44.1KHz - 16bit = 2 Hours |

## Supplied Accessories

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|---|
| Case |
| Power Supply |
| Instructions |
| Windshield |
| Rechargeable Batteries |

## Gallery



Export PDF : August 28 2026