

CLD-V2600 / CLD-V2400 and CD-Audio Basics

Introduction

The CLD-V2600 / CLD-V2400 is an industrial level combination laserdisc/compact disc player marketed by Pioneer Communications of America, Inc. (PCA). The player can output four channels of audio on laserdiscs (two digital or two analog at one time) and two digital audio channels on compact discs.

The CLD-V2600 / CLD-V2400 can play the following discs:

LaserDisc — 12 inch, 8 inch, double or single-sided, digital and analog audio or only analog audio.

Compact Disc — 5-inch, single-sided, digital, 74 minutes max.

Compact Disc Single — 3 inch, single-sided, digital, 20 minutes max.

CDV (CD with Video) — 5-inch, single-sided, 20 minutes max. digital audio /5 minutes max. video with analog and digital audio. Total playback time 25 minutes.

As with other Pioneer Industrial LaserDisc players, the CLD-V2600 / CLD-V2400 is both a Level I and Level III player.

Level I control of the CLD-V2600 / CLD-V2400 is achieved by three (3) methods.

- CU-V103 Remote Control Unit packaged with the player
- UC-V108BC or UC-V109BC LaserBarcode Reader (optional)
For LaserBarcodes or CD Barcodes
- The control buttons on the front panel of the players.

Level III control of the CLD-V2600 / CLD-V2400 is achieved via the serial interface port on the player. This is the standard RS-232C interface connector found on other Pioneer industrial players such as the LD-V8000, LD-V4400, LD-V2200.

The CLD-V2600 / CLD-V2400 supports Pioneer's LaserDisc mnemonic command protocol and includes additional commands to control compact discs.

Compact Disc Basics

To effectively use compact discs with the CLD-V2600 / CLD-V2400, those who are familiar with laserdiscs must also understand the basic composition and structure of compact discs. A digital audio compact disc is a single-sided medium that is recorded in the CLV (Constant Linear Velocity) format. It can contain a maximum of 74 minutes of playing time per side.

Material on a digital audio compact disc are encoded with the following markers:

- 1) track number
- 2) index number
- 3) time number
- 4) block number

These markers are used as addresses to instruct the player to search to specific locations on the disc. They are used when creating CD Barcode commands, transmitting computer commands, and when controlling the player with the remote control unit.

1. Tracks

Track is the term that is used to describe individual songs or audio segments on a Compact Disc. For example, if a CD has 12 separate musical entries, it is said to have "12 tracks". Tracks allow the user to search to and play back specific audio selections on the disc.

A maximum of 99 (01-99) tracks are allowed on one side of a CD.

2. Index

Tracks can be further divided into indices. Most commercial music compact discs have only one index per track (index 01). However, many CDs that are created for music education contain more than one index per track.

Indices allow the user direct access to a specific section of the musical piece. For example, a symphonic movement may be defined as one track on the disc and the musical passages within that movement may be further defined as indices. Therefore, the user can search to and play back a specific passage (index) within a particular movement (track).

Index searches or segment plays are only possible with the CLD-V2600 / CLD-V2400 using barcode commands or control commands sent from an external computer. The user cannot search to the index level on the CLD-V2600 / CLD-V2400 when using the remote control unit.

Specifications allow a maximum of 99 (01-99) indices within each track on a CD. There is no 00 index, except in the pause areas between tracks.

3. Time Number

Like CLV laserdiscs, compact discs are encoded with time numbers. Time is represented on the disc as a four (4) digit number: 2 digits for minutes (01-99) and 2 digits for seconds (00-59).

Although the specification allows for up to 99 minutes to be entered as the minute argument, in reality this number will be less than or equal to 74 minutes, the maximum playing time on one side of a CD.

Time numbers allow the user direct access to any location on the disc by simply indicating the time code address point. The player can search to any minute/second point on the CD. Time segment plays are only possible with the CLD-V2600 / CLD-V2400 using barcode commands or control commands sent from an external computer.

- The maximum number to address the minute location is 99 (01-99).
- The maximum number to address the second location is 59 (00-59).
- A compact disc does not have an address to indicate hours.

4. CD Block or "Frame"

The smallest unit on a compact disc is a block or frame. We use the term **block** to avoid confusion with the term "frame" used to describe a frame of video.

There are 75 blocks (00-74) per second on a CD. When the player is put into **Block Mode**, the player can read an extended time number that includes block numbers. The user can search to any minute/second/block point on the compact disc.

Blocks allow the user direct access to the smallest possible unit available on a Compact Disc. With blocks, the user can play back a 1/75th second segment to highlight a specific note or beat in a musical piece, or a specific spoken syllable.

Block searches or segment plays are only possible with the CLD-V2600 / CLD-V2400 when using barcode commands or control commands sent from an external computer. The user cannot search to the block level with the remote control unit.

75 (00-74) blocks of digital information are encoded per each second of playing time on the compact disc.

5. Table of Contents & Searches

Unlike most laserdiscs, compact discs have a Table of Contents (TOC) in the lead-in section at the beginning of every disc. The TOC indicates the first track, the last track, and the last time number (down to the block level) encoded on the disc. The TOC is used to determine the last address on the disc, and the player searches to the last absolute address. If the CLD-V2600 / CLD-V2400 receives an instruction to search to an address greater than the last address on a compact disc the player will not perform the search but, instead, will return an error code to an external computer.