

DDL 204

18-Bit Digital Signal Delay



- Mono 1 in/4 out or stereo 1 in/2 out
- Set delay in cm, m, ft, in., msec or μ sec
- Edit delays relative to each other or separately
- Store up to 30 presets
- Switchable edit protection
- Linear 18-bit data format; internally, 24-bit
- S/N ratio >100 dB
- Electronically balanced inputs/outputs
- Optional transformers

SPECIFICATIONS

Conditions:

1. 0 dBu = 0.775 volts rms.

OVERALL SPECIFICATIONS

Input/Output Configuration:

Stereo 1 in/2 out; mono 1 in/4 out

Maximum Delay,

Mono Mode:

2,798 msec

Stereo Mode:

1,399 msec

Delay Increments,

Time:

Microseconds, milliseconds

Distance:

Centimeters, meters, feet, inches

Delay Resolution,

Time:

5 microseconds

Distance:

1.7 mm (0.068 in.)

Frequency Response:

20-20,000 Hz \pm 0.5 dB

Number of Presets Storable:

30

Total Harmonic Distortion (1,000 Hz),

without Transformer:

<0.01%

with Transformer:

<0.1%

Signal-to-Noise Ratio:

>100 dB

Equalization, High-Frequency Shelving:

+0/-15 dB at 15,000 Hz

Front-Panel Controls:

Input 1; Input 2; Edit, Select (up and down), Store, Option and Bypass buttons; parameter-select/enter knob; Output 1, Output 2, Output 3 and Output 4; on/off switch

Front-Panel Displays:

LED level indicators (two); 2 x 16-digit alphanumeric LCD multifunction display; edit-, lock-, bypass-, mono- and stereo-mode indicators

Data Format,

A/D:

Linear 18 bit, sigma-delta, 64-times oversampling

D/A:

Linear 18 bit, 8-times oversampling

Common-Mode Rejection Ratio (CMRR),

1,000 Hz:

>70 dB

Grounding:

Ground-lift switch disconnects ground from chassis to eliminate hum

Chassis Construction:

Painted steel

Colors,

Front Panel:

Gray with white nomenclature

Top and sides:

Gray

Input and Bottom Panel:

Black with white nomenclature

Optional Accessories:

TRB-5 input transformer kit (two required);

TRB-4 output transformer kit (four required)

Power Requirements:

90-250 volts, 50-60 Hz ac, no changes required, 21 watts maximum

Overall Dimensions (see Figure 1),

Height:

43.6 mm (1.72 in.)

Width:

483 mm (19.0 in.)

Depth:

287 mm (11.3 in.)

Net Weight:

4.0 kg (8.8 lb)

Shipping Weight:

5.5 kg (12 lb)

INPUT SPECIFICATIONS

Rated Input Voltage:

1.23 volts (+4 dBu)

Maximum Input Voltage:

9.0 volts (+21 dBu)

Input Impedance:

20,000 ohms

Input Configuration:

Electronically balanced (TRB-5 input transformer kit available (two required))

Input Connectors:

Female three-pin XLR type, pin 2 hot

OUTPUT SPECIFICATIONS

Rated Output Voltage:

1.23 volts (+4 dBu)

Maximum Output Voltage:

9.0 volts (+21 dBu)

Output Impedance:

<100 ohms

Minimum Load Impedance:

600 ohms

Output Configuration:

Electronically balanced (TRB-4 output transformer kit available (four required))

Output Connectors:

Male three-pin XLR type, pin 2 hot (output polarities invertible)

DESCRIPTION

The EV/Dynacord DDL 204 is a high-quality signal delay that can be configured for stereo 1-in/2-out or mono 1-in/4-out operation. Setting of delays can be performed individually and independently of each other in the "normal" modes, or simultaneously and relative to each

DDL 204 SPECIFICATION GRAPHICS

FIGURE 1 — DDL 204 Dimensions

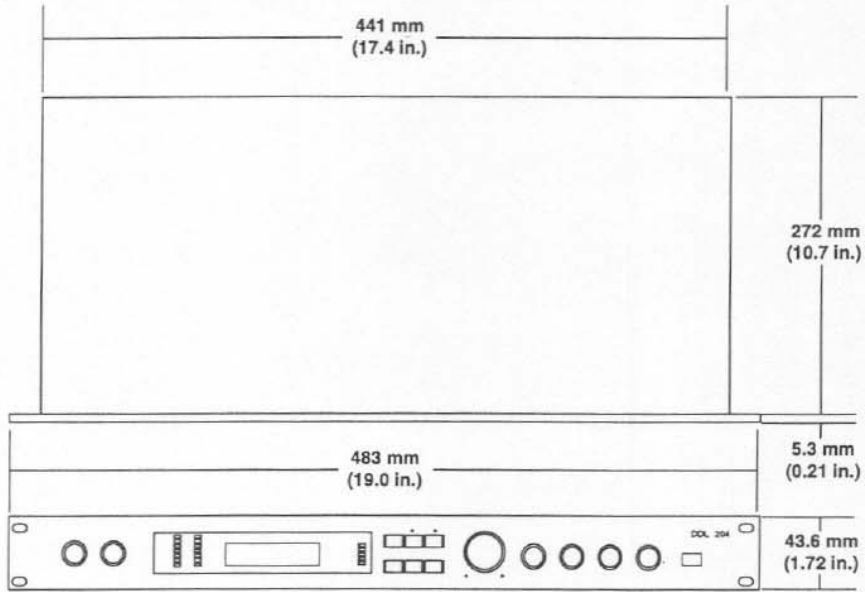


FIGURE 2 — DDL 204 Front and Rear Panels

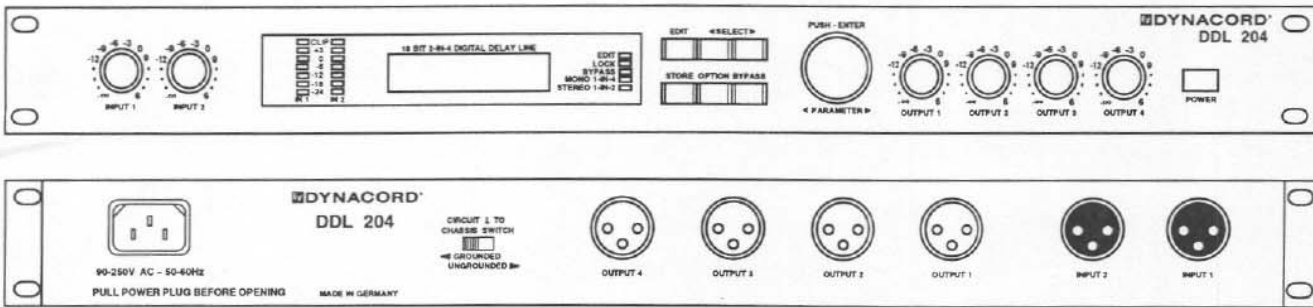
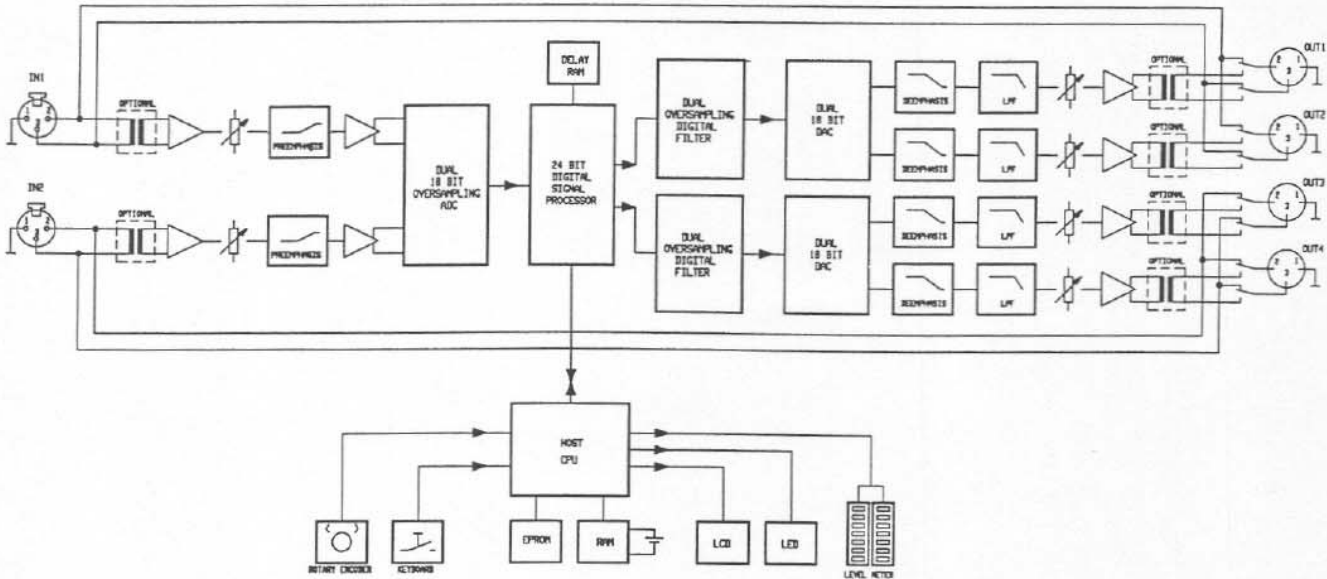


FIGURE 3 — DDL 204 Block Diagram



other in the "ganged" modes. The four outputs make it possible to serve up to four loudspeaker groups with different delay times, avoiding echo effects, increasing speech intelligibility and preserving directional realism when distributed loudspeakers have been used to supplement the coverage of a stage-located source cluster. The DDL 204 also may be used to achieve optimal alignment of adjacent loudspeaker elements, maximizing coverage uniformity in the audience area. Sports arenas, houses of worship, performing arts centers and large concert sound reinforcement rigs are some examples of systems that will benefit from the use of a DDL 204.

The DDL 204 has two electronically balanced inputs and four electronically balanced outputs, all of which may be transformer isolated with the optional TRB-5 (input) and TRB-4 (output) transformer kits. Each output may be delayed in units of time (microseconds and milliseconds) or distance (centimeters, meters, inches and feet). Internally, the DDL 204 calculates in multiples of 5 microseconds, which provides a distance resolution of 1.7 millimeters (68 thousandths of an inch). Maximum delay time in the mono mode is 2,798 milliseconds, equivalent to 964 meters (3,162 feet). In the stereo mode, maximum delay is 1,399 milliseconds. The input and output connectors are equipped with relays that automatically switch the unit to bypass in case of any internal malfunction.

All outputs are equipped with equalization shelving +0/-15 dB at 15,000 Hz. The polarity of each output is invertible. The inputs and outputs have continuously variable rotary controls adjustable between off and +6 dB re unity gain.

The memory section of the DDL 204 is capable of storing 30 presets. These presets may be titled to facilitate setup for a given system configuration. Presets may be "locked" via a menu-driven code to prevent unauthorized changes. Level matching is made easy by the dual input-level controls and LED ladders that indicate internal clipping and have both peak and peak-hold ballistics.

The DDL 204 contains the Motorola 56004 digital signal processor surrounded by a linear 18-bit sigma-delta A/D converter with 64-times oversampling and a linear 18-bit D/A converter with 8-times oversampling. Internally, the 56004 processes with a 24-bit data format, ensuring a high signal-to-noise ratio, very low noise, frequency response flat from 20 to 20,000 Hz, and excellent overall data transfer.

Front-panel ergonomics were carefully considered in the design of the DDL 204. The 2 x 16-digit LCD window displays the current memory with its delay settings. In the edit mode, the window displays information in an intuitive, numeric and graphic form that makes system setup easy.

The power supply of the DDL 204 adapts automatically to any voltage/frequency from 90 to 250 volts, 50 or 60 Hz. The rear-mounted IEC connector allows easy adaptation to any type of ac socket. A ground-lift switch ensures that any chassis-induced ac hum can be eliminated. The DDL 204 mounts in one EIA/IEC rack space. Mounting hardware is included.

The DDL 204 front and rear panels are shown in Figure 2. The block diagram is shown in Figure 3.

ARCHITECTS' AND ENGINEERS' SPECIFICATIONS

The unit shall be a digital signal delay which may be configured for stereo 1-in/two-out or mono 1-in/four-out operation. Delays shall be adjustable independently of each other in the "normal" modes or relative to each other in the "ganged" modes. Maximum delay time in the mono mode shall be 2,798 milliseconds. Maximum delay time in the stereo mode shall be 1,399 milliseconds. Delay shall be selectable in centimeters, meters, inches, feet, microseconds or milliseconds. Delay resolution shall be 5 microseconds, corresponding to 1.7 mm (68 thousandths of an inch). All outputs shall be equipped with equalization shelving +0/-15 dB at 15,000 Hz. The polarity of each output shall be invertible. All inputs and outputs shall have continuously variable rotary controls adjustable between off and +6 dB re unity gain.

The unit shall be capable of storing 30 presets. All parameters shall be fully programmable and storable in any memory location. The unit shall have a lock mode to prevent unauthorized changes. Input and output connectors shall be equipped with relays to automatically switch the unit to bypass operation in case of internal malfunction.

Inputs and outputs shall be electronically balanced 3-pin XLR connectors with pin 2 positive. Internal receptacles shall be provided for retrofitting optional TRB-5 input and TRB-4 output transformers. The unit shall contain linear 18-bit sigma-delta A/D converters with 64-times oversampling and linear 18-bit D/A converters with 8-times oversampling. The internal format shall be 24 bits. The unit shall meet the following performance specifications: frequency response, 20-20,000 Hz ± 0.5 dB; signal-to-noise ratio, >100 dB; THD, <0.01% at 1,000 Hz; nominal input and output voltages, 1.23 V (+4 dBu); input impedance, 20,000 ohms; maximum input voltages, 9.0 V (+21 dBu); output impedance, <100 ohms; and minimum load impedance, 600 ohms.

The unit shall operate on voltages from 90 V to 250 V ac, 50 to 60 Hz, without adjustment. Power consumption shall be 21 watts maximum. The unit shall be manufactured in accordance with all safety classes and fulfill all applicable interference suppression approvals (FCC, VDE and IED specifications). The unit shall be rack mountable in one EIA/IEC standard rack

space. Dimensions shall be 43.6 mm (1.72 in.) x 483 mm (19.0 in.) x 287 mm (11.3 in.) hwd. Net weight shall be 4.0 kg (8.8 lb).

The signal delay unit shall be the EV/Dynacord DDL 204.

UNIFORM LIMITED WARRANTY

Electro-Voice products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. **Exclusions and Limitations:** The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than Electro-Voice or any of its authorized service representatives. **Obtaining Warranty Service:** To obtain warranty service, a customer must deliver the product, prepaid, to Electro-Voice or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from Electro-Voice at 600 Cecil Street, Buchanan, MI 49107 (616/695-6831 or 800/234-6831). **Incidental and Consequential Damages Excluded:** Product repair or replacement and return to the customer are the only remedies provided to the customer. Electro-Voice shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. **Other Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Electro-Voice and EV/Dynacord Electronics are guaranteed against malfunction due to defects in materials or workmanship for a period of three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

Service and repair address for this product: Electro-Voice, Inc., 600 Cecil Street, Buchanan, Michigan 49107 (616/695-6831 or 800/234-6831).

Specifications subject to change without notice.