

# **Operators Manual**

# **DN7204**

EVI PRO AUDIO GROUP  
Klark Teknik Building,  
Walter Nash Road, Kidderminster,  
Worcestershire DY11 7HJ  
England

Tel: (01562)741515 Fax: (01562)745371



## DECLARATION OF CONFORMITY

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### *The Directive Covered by this Conformity*

89/336/EEC Electromagnetic Compatibility Directive, amended by 92/31/EEC & 93/68/EEC.

73/23/EEC Low Voltage Directive, amended by 93/68/EEC.

### *The Products Covered by this Declaration*

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<b>Equipment Type</b>	<b>Product Name</b>	<b>Variants</b>
Graphic Equaliser DN332	DN300	DN360, DN301,
Preset Equaliser	DN320	DN330
Parametric Equaliser	DN405	DN410
Dynamics Processor DN514	DN500	DN504, DN510,
Audio Analyser	DN6000	
Crossover	DN800	
Delay Line	DN7204	DN7103
Programmable Equaliser	DN3600	DN3601
Remote Control System Crossover	DN3698	DN3603
Programmable Equaliser	DN8000	
	DN4000	

### *The Basis on which Conformity is being Declared*

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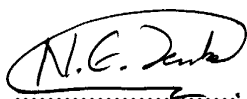
The Products named above and hence the Variants thereof listed above comply with the requirements of the above EU directives by meeting the following standards:

EN 50081-1 (EN55022 class B)

EN 50082-1 (IEC801 Part 2, 4 / ENV 50140 / ENV 50141

EN 60065.

Signed:



N. G. Tembe

Authority:

Head of Engineering, EVI Audio (U.K.) Plc

Date:

1st January 1997

### **Attention!**

The attention of the specifier, purchaser, installer or user is drawn to the special limitations to use which must be observed when these products are taken into service to maintain compliance with the above directives. Details of these special measures and limitations to use are available on request, and are also contained in product manuals.

## **Attention!**

### **Cables:**

This product should only be used with high quality, screened twisted pair audio cables, terminated with metal bodied 3-pin XLR connectors. The cable should be connected to pin 1. Any other cable type or configuration for the audio signals may result in degraded performance due to electromagnetic interference.

### **Electric Fields:**

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz to 20KHz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation signal may be experienced under extreme conditions (3V/m, 90% modulation).

## CONTENTS

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AFTER YOU HAVE UNPACKED THE UNIT	6
INTRODUCTION	7
IMPORTANT NOTES	8
Installation	8
Cables	8
Protection	8
FRONT PANEL	9
Input Level Trim & Meter	9
Display	9
OPTION key	9
STORE key	9
EDIT key	9
SELECT key	9
PARAMETER rotary encoder	9
ENTER key	9
OUTPUTS 1-4 - Rotary controls	9
Limit LEDs 1-4	9
POWER switch	9
REAR PANEL	10
Power socket	10
Ground lift switch	10
OUTPUTS 1-4 XLR sockets	10
INPUTS 1-2 XLR sockets	10
OPERATION	11
Play mode	11
Edit mode	11
Parameter types and ranges	13
Store mode	15
Options mode	15
LCD contrast	15
Output priority/Parameter priority	15
Lock/unlock	15
MIDI channel	15
Limiter threshold	15
SPECIFICATION	16

## **Klark Teknik DN7204 Programmable Delay Line with Equalisation**

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To obtain maximum performance from this precision electronic product, please study these instructions carefully. Installing and operating the DN7204 is not complicated, but the flexibility provided by its operating features merits familiarization with its controls and connections.

### **After you have unpacked the unit:**

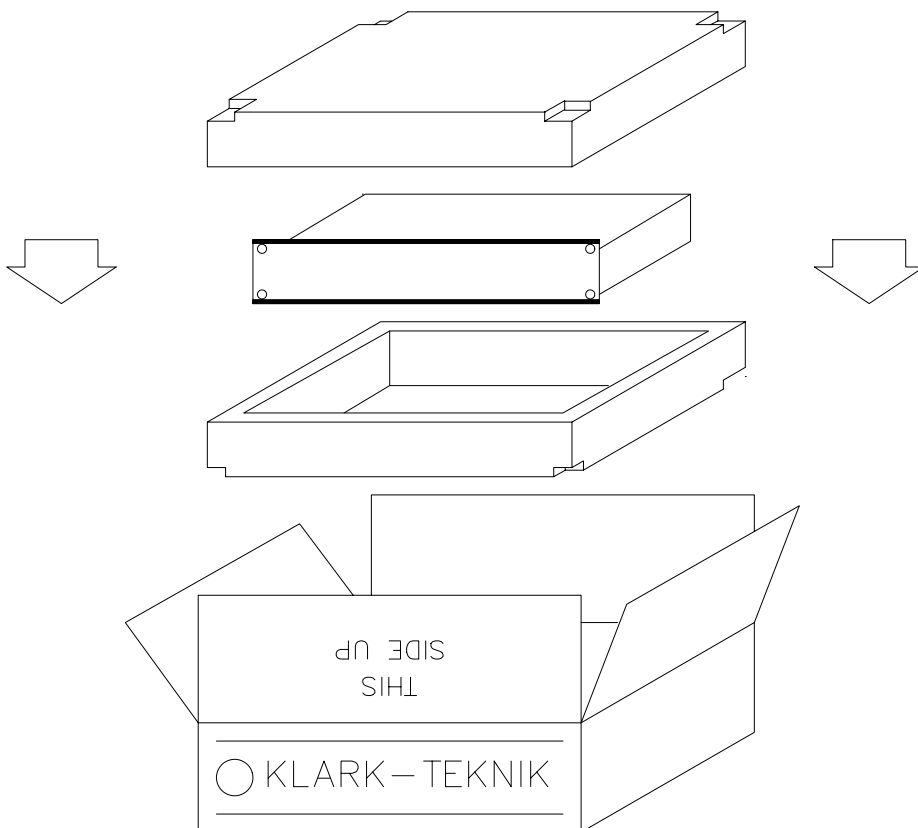
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Save all the packing materials - they will prove valuable should it become necessary to transport or ship this product.

Please inspect this unit carefully for any signs of damage incurred during transportation. It has undergone stringent quality control inspection and tests prior to packing and left the factory in perfect condition.

If, however, the unit shows any signs of damage, notify the transportation company without delay. Only you, the consignee, may institute a claim against the carrier for damage during transportation.

If necessary, contact your supplier or as a last resort, your Klark Teknik importing agent, who will fully co-operate under such circumstances.



## INTRODUCTION

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Designed to meet and exceed the needs of the recording, broadcast, installation and live sound industries, the Klark Teknik DN7204 Programmable Delay Line is a high quality, 2-input, 4-output configurable audio delay line that combines state-of-the-art DSP performance with ease of use. Each output may be fed from either input, giving possible configurations of Stereo 1-in, 2-out; two independent 1-in, 2-outs; 1-in, 3 out + 1-in 1-out: 1-in, 4-out. To further extend the flexibility of the Delay line, the unit also incorporates two bands of parametric equalization and a variable high frequency shelf on each output.

The maximum delay time of more than 1400 milliseconds allows total delay compensation of up to 420 meters. The delay time can be set and viewed in milliseconds, meters, centimeters, inches or feet. For these 'distance' modes, a temperature parameter can be set to compensate for environmental variations.

As well as delay and EQ, each output features adjustment of phase and level in the digital domain and an overshoot free peak limiter. The inputs and outputs all feature level trim controls in the analogue domain, for headroom optimization.

The inputs and outputs are fully balanced on XLR connectors and are wired conventionally with pin 1 as ground. Because the system is fully floating, either pin 2 or pin 3 can be designated as hot as long as the same protocol is adhered to for both the input and the output connectors.

## **IMPORTANT NOTES**

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### **Installation**

The unit is set at the factory for 90 to 250 volt operation (50-60Hz). Power connection is made by means of an IEC standard power socket.

The DN7204 is designed for use in both fixed and mobile installations where it can be mounted in a conventional 19" rack occupying just 1U of height. In mobile situations where rough handling is a possibility, it is advisable to support the rear of the unit to prevent undue stress being placed on the front panel. Ensure that the unit has sufficient ventilation and that it is not placed directly over any device that runs hot such as a power amplifier or console power supply. Neither should the unit be exposed to direct sunlight.

### **Cables:**

This product should only be used with high quality, screened, twisted pair audio cables, terminated with metal bodied 3-pin XLR connectors. The cable shield should be connected to pin 1. Any other cable type or configuration for the audio signals may result in degraded performance due to electromagnetic interference.

### **Protection**

**CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK OR FIRE, DO NOT REMOVE COVER. NO USER-SERVICEABLE PARTS INSIDE.**

**DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.  
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.**

**RISQUE DE SHOCK - NE PAS ENLEVER.**

**WARNING: THIS EQUIPMENT MUST BE EARTHED**

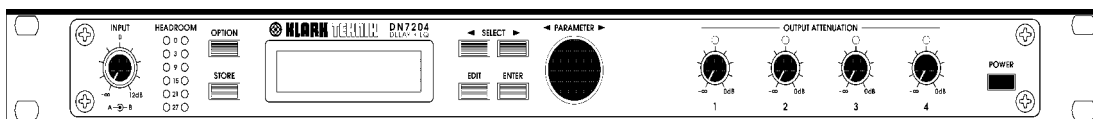
If the unit is subjected to extreme fluctuation of temperature, eg from being transported from outside into a heated room, condensation can form. The unit should not be switched on until it has reached room temperature.

Inside the unit there is a battery to maintain the memories and settings when it is switched off. The service life of the battery is approximately 5 years. If the message "Service required, change internal battery" is displayed, contact an authorized Klark Teknik service center.



## FRONT PANEL

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### Input Level Trim & Meter

These controls are used to adjust the incoming signal level to the headroom of the digital system; also to fully attenuate the signal for system troubleshooting. The signal can be boosted by 12dB.

The headroom meter indicates the incoming signal level relative to the maximum level of the digital system without clipping.

### Display

The 2 x 16 character Liquid Crystal Display shows the input to output routing in Play mode. In Edit and Options mode it shows the various parameters and their value or status.

### OPTION key

This key selects and deselects the Options mode.

### STORE key

This key allows the user to Store the current setting in any of 32 non-volatile memory locations.

### EDIT key

This key selects and deselects the Edit mode. Parameters are selected using the Select keys and adjusted using the 'Parameter' rotary encoder.

### SELECT keys

These keys Select the next or previous parameter in Edit mode, the next or previous option in Options mode or the next or previous memory in Play mode.

### PARAMETER rotary encoder

This is used to adjust parameters in Edit mode, to change settings in Options mode and to Select memories in Play mode.

### ENTER key

This key is used to recall a selected memory in Play mode.

### OUTPUTS 1 to 4 - Rotary controls

These are output attenuators for the 4 outputs. They are used to match the output levels to the maximum or desired input level of the next processor in the signal chain.

### Limit LEDs 1 to 4

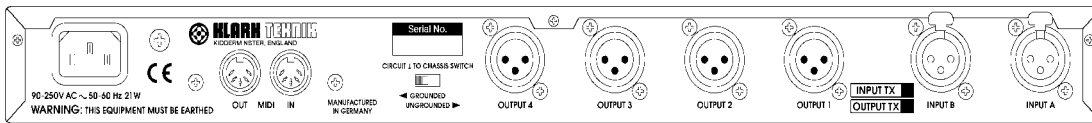
Each LED lights when the signal level for that output reaches the limiter threshold. The limiters are overshoot free types, with a true  $\infty : 1$  ratio.

### POWER switch

This switch is used to switch the unit ON and OFF.

## REAR PANEL

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### Power Socket

The unit is designed to run from an ac supply, 90 to 250 volts, 50 to 60Hz. The unit must be earthed.

### Ground Lift switch

This switch can be used to prevent hum loops. It disconnects circuit ground from chassis earth. When connected to equipment in the same rack the switch is best left in the “grounded position”. When used with remotely located equipment, that may have a different earth potential, better results may be achieved by using the “ungrounded” position.

### OUTPUTS 1 - 4 XLR sockets

These are electronically balanced for voltage and current.

### INPUTS 1 - 2 XLR sockets

These are electronically balanced.

## OPERATION

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### Play mode

At switch on, the unit enters Play mode. The display shows the routing configuration (Stereo, Mono, Dual) and the last recalled memory number.

To recall a memory:

1. Step through the available memories with the Select keys, or scroll through them with the Parameter encoder.
2. Press the Enter key to recall the selected memory.

To change any parameters, enter the Edit mode by pressing the Edit key:

### Edit mode

Enter Edit mode by pressing the Edit key. You can also return to Play mode by pressing the Edit key again, or enter Store or Options mode by pressing the Store or Options keys respectively. To Edit parameters:

1. Select parameters from the parameter list by using the Select keys.
2. Adjust the parameters by turning the Parameter encoder.

**CAUTION:** Your alterations have not been stored and will be lost next time a program is recalled! A message on the display warns of this condition.

3. If you wish to save your alterations in a memory, press the Store switch. See below.

The first parameter is:

**CONFIGURATION** This may be Mono (input A to outputs 1, 2, 3, or 4), Stereo (input A to outputs 1 and 2; input B to outputs 3 and 4) or Dual (each output fed from either input). The configuration setting affects which parameters are available in the list:

### Configuration:

<b>Mono</b>	<b>Stereo</b>	<b>Dual</b>
EDIT Temperature‡	EDIT Temperature‡	EDIT Temperature‡
<b>Parameter</b>		
EDITA Master Del	EDIT Master Del	EDITA Master Del
<b>List:‡</b>		EDITB Master Del
EDIT① Delay	EDIT①&② Delay	
EDIT① Level	EDIT①&② Level	EDIT① Input
EDIT① Phase	EDIT①&② Phase	EDIT① Delay
EDIT① PEQ 1: Frq	EDIT①&② PEQ 1: F	EDIT① Level
EDIT① PEQ 1: Q	EDIT①&② PEQ 1: Q	EDIT① Phase
EDIT① PEQ 1: Gn	EDIT①&② PEQ 1: G	EDIT① PEQ 1: Frq
EDIT① PEQ 2: Frq	EDIT①&② PEQ 2: F	EDIT① PEQ 1: Q
EDIT① PEQ 2: Q	EDIT①&② PEQ 2: Q	EDIT① PEQ 1: Gn
EDIT① PEQ 2: Gn	EDIT①&② PEQ 2: G	EDIT① PEQ 2: Frq
EDIT① Shelf: Frq	EDIT①&② Shelf: F	EDIT① PEQ 2: Q
EDIT① Shelf: Gn	EDIT①&② Shelf: G	EDIT① PEQ 2: Gn
EDIT① Lim Thresh	EDIT①&② Lm Thrsh	EDIT① Shelf: Frq
EDIT② Delay	EDIT③&④ Delay	EDIT① Shelf: Gn
EDIT② Level	EDIT③&④ Level	EDIT① Lim Thresh
EDIT② Phase	EDIT③&④ Phase	EDIT② Input
EDIT② PEQ 1: Frq	EDIT③&④ PEQ 1: F	EDIT② Delay

EDIT② PEQ 1: Q	EDIT③&④ PEQ 1: Q	EDIT② Level
EDIT② PEQ 1: Gn	EDIT③&④ PEQ 1: G	EDIT② Phase
EDIT② PEQ 2: Frq	EDIT③&④ PEQ 2: F	EDIT② PEQ 1: Frq
EDIT② PEQ 2: Q	EDIT③&④ PEQ 2: Q	EDIT② PEQ 1: Q
EDIT② PEQ 2: Gn	EDIT③&④ PEQ 2: G	EDIT② PEQ 1: Gn
EDIT② Shelf: Frq	EDIT③&④ Shelf: F	EDIT② PEQ 2: Frq
EDIT② Shelf: Gn	EDIT③&④ Shelf: G	EDIT② PEQ 2: Q
EDIT② Lim Thresh	EDIT③&④ Lm Thrsh	EDIT② PEQ 2: Gn
EDIT③ Delay	EDIT Delay Unit	EDIT② Shelf: Frq
EDIT③ Level		EDIT③ Input
EDIT③ Phase		EDIT③ Delay
EDIT③ PEQ 1: Frq		EDIT③ Level
EDIT③ PEQ 1: Q		EDIT③ Phase
EDIT③ PEQ 1: Gn		EDIT③ PEQ 1: Frq
EDIT③ PEQ 2: Frq		EDIT③ PEQ 1: Q
EDIT③ PEQ 2: Q		EDIT③ PEQ 1: Gn
EDIT③ PEQ 2: Gn		EDIT③ PEQ 2: Frq
EDIT③ Shelf: Frq		EDIT③ PEQ 2: Q
EDIT③ Shelf: Gn		EDIT③ PEQ 2: Gn
EDIT③ Lim Thresh		EDIT③ Shelf: Frq
EDIT④ Delay		EDIT③ Shelf: Gn
EDIT④ Level		EDIT③ Lim Thresh
EDIT④ Phase		EDIT④ Input
EDIT④ PEQ 1: Frq		EDIT④ Delay
EDIT④ PEQ 1: Q		EDIT④ Level
EDIT④ PEQ 1: Gn		EDIT④ PEQ 1: Frq
EDIT④ PEQ 2: Frq		EDIT④ PEQ 1: Q
EDIT④ PEQ 2: Q		EDIT④ PEQ 1: Gn
EDIT④ PEQ 2: Gn		EDIT④ PEQ 2: Frq
EDIT④ Shelf: Frq		EDIT④ PEQ 2: Q
EDIT④ Shelf: Gn		EDIT④ PEQ 2: Gn
EDIT④ Lim Thresh		EDIT④ Shelf: Frq
EDIT Delay Unit		EDIT④ Shelf: Gn
		EDIT④ Lim Thresh
		EDIT Delay Unit

†Note: The parameters are listed here in ‘Output Priority’ order. The order of parameters in the list changes for ‘Parameter Priority’. See ‘Options’ mode.

‡Note: The Temperature parameter is only available in ‘distance’ mode, ie when delay units are meters, centimeters, inches or feet.

## Parameter types and ranges:

**Temperature‡** The ambient air temperature of the space to be compensated for. This temperature is used for conversion of distance (meters, centimeters, inches or feet) to time (milliseconds).

Range: 0°C to 40°C in 1° steps.

**Master Delay** The basic delay time from an input to all its outputs. The total delay time from input to output is Master Delay for that input plus Delay for that output.

Range: 0 to 1400 milliseconds.

○ **Delay** The delay for output number ○.

Range: 0 to 1400 milliseconds.

○ **Level** The output level for output number ○.

Range: +12dB to -24dB in 1dB steps, plus 'Mute'.

○ **Phase** The relative phase shift for output number ○.

Range: Inverted / Not inverted.

○ **PEQ 1: Frq** Frequency of parametric EQ 1 for output number ○.

Range: 20Hz to 20kHz

○ **PEQ 1: Gn** Gain of parametric EQ 1 for output number ○.

Range: -12dB to +12dB in 1dB steps.

○ **PEQ 1: Q** Q of parametric EQ 1 for output number ○.

Range: 3 octaves to 0.08 octaves

○ **PEQ 2: Frq** Frequency of parametric EQ 2 for output number ○.

Range: 20Hz to 20kHz

○ **PEQ 2: Gn** Gain of parametric EQ 2 for output number ○.

Range: -12dB to +12dB in 1dB steps.

○ **PEQ 2: Q** Q of parametric EQ 2 for output number ○.

Range: 3 octaves to 0.08 octaves

○ **Shelf: Frq** Frequency of high-frequency shelf EQ for output number ○.

Range: 100Hz to 16kHz

○ **Shelf: Gn** Gain of high-frequency shelf EQ for output number ○.

Range: -12dB to +12dB in 1dB steps.

○ **Lim Thresh:** Threshold for the Peak Limiter on output number ○. The limiter allows no overshoot, has a true  $\infty : 1$  ratio and instantaneous attack and release phases. It is placed in the signal chain after all equalization and level controls. The limiter threshold can be set in units of dBu or volts, referenced to the output level. In both cases, it is assumed that the output attenuators are set at zero.

**Delay Unit**      Units for the Delay parameters.  
Range:              milliseconds, meters, centimeters, inches or feet

### **Store mode**

To save an edited program, or to copy a program from one location to another:

1. Press the Store switch to enter Store mode from any other.
2. The display now shows the current memory number and the destination memory number.
3. If you wish, use the rotary encoder to change the destination memory number.
4. Press the enter switch to initiate the Store.

**Note:** Up to this point, the Store process can be canceled by pressing any other switch, ie Edit or Options.

5. Press the Store switch to confirm the Store and exit the Store mode.

### **Options mode**

Use the Select switches to select Options. Use the rotary encoder to adjust them:

#### **LCD Contrast**

Rotate the encoder to adjust the LCD contrast/viewing angle.

#### **Output Priority/Parameter Priority**

Rotate the encoder to change the order of the Edit parameter list.

**Output Priority:** Parameters are grouped by output, as listed above.

**Parameter Priority:** Parameters are grouped by type, ie delay times for all outputs grouped together; level adjustment for all outputs grouped together.

#### **Lock/Unlock**

To lock the unit, preventing unauthorized adjustment of parameters and memory recall:

1. Rotate the encoder to dial in your chosen 3 digit code number.
2. Press the enter switch.

**CAUTION!** Do not forget your code number! If the code number is lost, the unit can only be unlocked after contacting the Klark Teknik factory!

To unlock the unit:

1. Rotate the encoder to dial in your chosen 3 digit code number.
2. Press the enter switch.

#### **MIDI Channel**

Rotate the encoder to select one of MIDI channels 1 to 16, OMNI or OFF.

The DN7204 will transmit and receive MIDI program change messages on the specified channel. In Omni mode, transmission is on channel 1.

#### **Limiter threshold**

The threshold for the output peak limiters can be set in units of dBu or volts. Rotate the encoder to select either dBu or volts.

## SPECIFICATIONS

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### INPUTS

Type  
Impedance (ohm)  
    Balanced  
    Unbalanced  
Common mode rejection (1KHz)  
Max. level  
Insertion loss of optional transformers  
Analogue Gain

### TWO

Balanced (electronically)  
  
20k  
10k  
>70dB  
+21dBu  
1.5dB  
-∞ to +12dB

### OUTPUTS

Type  
Min. load impedance  
Source impedance  
Max. level  
Gain

### FOUR

Balanced (electronically)  
600ohm  
50ohm  
+21dBu into >2kohms  
-∞ to 0dB

### PERFORMANCE

Frequency response with EQ flat  
Distortion @ +4dBu  
With optional input transformer  
  
Dynamic range  
(20Hz to 20kHz unweighted)

+/-0.3dB (20Hz to 20kHz)  
<0.02% (20Hz to 20KHz)  
<0.1% (500Hz to 20KHz)  
<0.5% (20Hz to 500Hz)  
> 100dB

### POWER REQUIREMENTS

Voltage  
Consumption

90 to 250v @ 50 to 60Hz AC  
<25VA

### DIMENSIONS

Width  
Height  
Depth

483mm (19 inches)  
43.6mm (1.75 inches)  
295mm (11.6 inches)

### WEIGHT

Net  
Shipping

4kg  
6kg