Owners & Service Manual

DN7103

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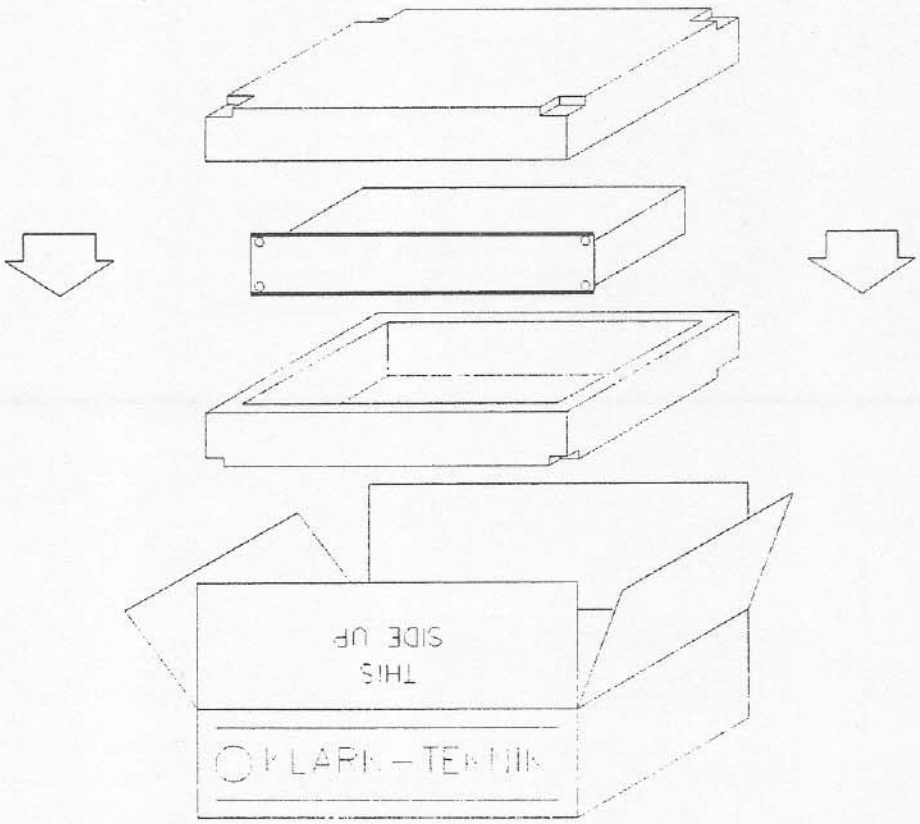
To obtain maximum performance from this precision electronic product, please study these instructions carefully. Installing and operating the DN7103 is not complicated, but the flexibility provided by its operating features merits familiarization with its controls and connections.

After you have unpacked the unit:

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

Designed to meet and exceed the needs of the recording, broadcast, installation and live sound industries, the Klark Teknik DN7103 Programmable Delay Line is a high quality, 1-input, 3-output configurable audio delay line that combines state-of-the-art DSP performance with ease of use. 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 1375 milliseconds allows total delay compensation of up to 400 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 input and outputs all feature level trim controls in the analogue domain, for headroom optimization.

The input 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

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 DN7103 is designed for use in both fixed and mobile installations where it can be mounted in a conventional rack space 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

Input Level Trim & Meter

This control is 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 memory number and output delay times 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 30 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 3 - Rotary controls

These are output attenuators for the 3 outputs. They are used to match the output levels to the maximum or desired input level of the next processor in the signal chain.

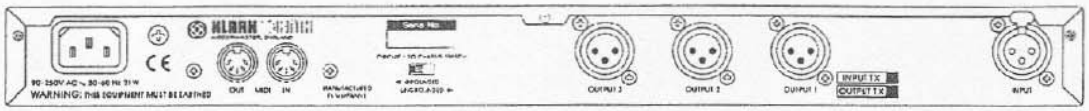
Limit LEDs 1 to 3

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

POWER switch

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

REAR PANEL



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, as it disconnects circuit ground from chassis. 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 - 3 XLR sockets

These are electronically balanced for voltage and current.

INPUT XLR socket

This is electronically balanced.

Play mode

At switch on, the unit enters Play mode. The display shows the output delay time 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.

Parameter List:†

	EDIT Temperature‡	EDIT, PEQ 1: Gn
	EDIT Master Del	EDIT, PEQ 2: Frq
	EDIT□ Delay	EDIT, PEQ 2: Q
	EDIT□ Level	EDIT, PEQ 2: Gn
	EDIT□ Phase	EDIT, Shelf: Frq
	EDIT□ PEQ 1: Frq	EDIT, Shelf: Gn
	EDIT□ PEQ 1: Q	EDIT, Lim Thresh
	EDIT□ PEQ 1: Gn	EDIT*f* Delay
	EDIT□ PEQ 2: Frq	EDIT*f* Level
	EDIT□ PEQ 2: Q	EDIT*f* Phase
	EDIT□ PEQ 2: Gn	EDIT*f* PEQ 1: Frq
	EDIT□ Shelf: Frq	EDIT*f* PEQ 1: Q
	EDIT□ Shelf: Gn	EDIT*f* PEQ 1: Gn
	EDIT□ Lim Thresh	EDIT*f* PEQ 2: Frq
	EDIT, Delay	EDIT*f* PEQ 2: Q
	EDIT, Level	EDIT*f* PEQ 2: Gn
	EDIT, Phase	EDIT*f* Shelf: Frq
	EDIT, PEQ 1: Frq	EDIT*f* Shelf: Gn
	EDIT, PEQ 1: Q	EDIT*f* Lim Thresh

†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 the input to all outputs. The total delay time from input to output is Master Delay for the input plus Delay for that output. Range: 0 to 1375 milliseconds.

¡ **Delay** The delay for output number ¡.
Range: 0 to 1375 milliseconds.

¡ **Level** The output level for output number ¡.
Range: +6dB 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: 0.4 to 20

¡ **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: 0.4 to 20

¡**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 ¥ : 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.
Range:

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 DN7103 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

INPUTS	**ONE**
Type	Balanced (electronically)
Impedance (ohm)	
Balanced	20k
Unbalanced	10k
Common mode rejection (1KHz)	>70dB
Max. level	+21dBu
Insertion loss of optional transformers	1.5dB
Analogue Gain	-¥ to +12dB
OUTPUTS	**THREE**
Type	Balanced (electronically)
Min. load impedance	600ohm
Source impedance	50ohm
Max. level	+21dBu into >2kohms
Gain	-¥ to 0dB
PERFORMANCE	
Frequency response with EQ flat	+/-0.3dB (20Hz to 20kHz)
Distortion @ +4dBu	<0.02% (20Hz to 20KHz)
With optional input transformer	<0.1% (500Hz to 20KHz)
	<0.5% (20Hz to 500Hz)
Dynamic range (20Hz to 20kHz unweighted)	> 100dB
POWER REQUIREMENTS	
Voltage	90 to 250v @ 50 to 60Hz AC
Consumption	<25VA
DIMENSIONS	
Width	483mm (19 inches)
Height	43.6mm (1.75 inches)
Depth	303.5mm (12 inches)
{for DN7103:	295mm(11.6 inches)}
WEIGHT	
Net	4kg
Shipping	6kg