Operators Information

DN4000

Version 1.0

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INTRODUCTION

Designed to meet and exceed the needs of the recording, broadcast, installation and live sound industries, the Klark Teknik DN4000 Dual Parametric Equaliser with Delay is a high quality, dual channel, 5-band parametric equaliser that combines state-of-the-art DSP performance with ease of use. Each channel is provided with programmable low pass and high pass filter, low frequency and high frequency shelf filters, and a delay line in addition to the 5 bands of fully parametric EQ. The high brightness, high contrast LCD display panel, combined with dedicated filter selection switches and no less than three rotary encoders, gives a degree of intuitive ease of use seldom seen in a programmable product. The high resolution 20 bit digital conversion system gives an unprecedented dynamic range of over 112dB (20Hz to 20KHz, unweighted).

The inclusion of a delay line on each channel, with a maximum delay time of 340mS, overcomes the need for a separate digital delay that would, under normal circumstances, be the limiting factor to audio quality in the signal chain. Additionally, an optional AES/EBU format digital audio interface can be fitted.

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. Input and output isolation transformers are available options.

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 DN4000 is designed for use in both fixed and mobile installations where it can be mounted in a conventional 19 inch rack occupying just 2u 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.

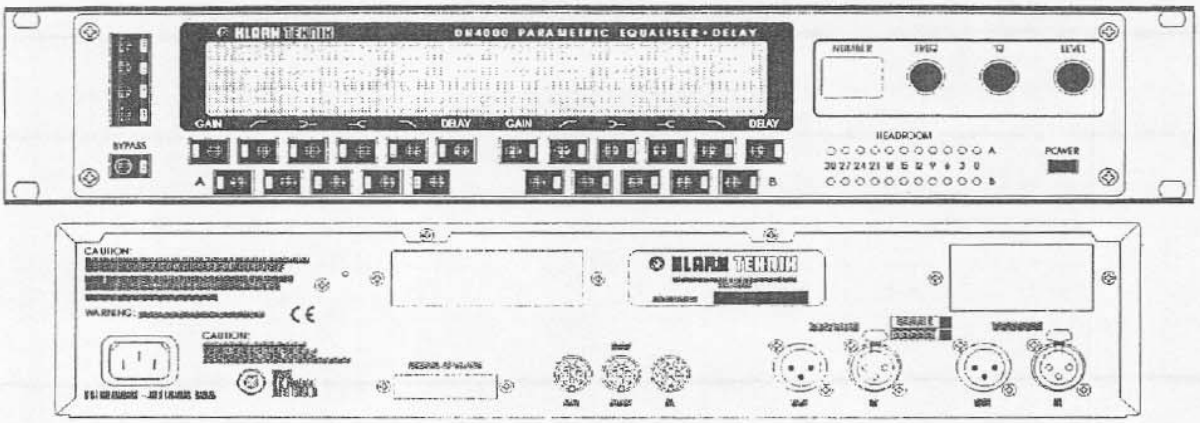
RISQUE DE SHOCK - NE PAS ENLEVER.

WARNING: THIS EQUIPMENT MUST BE EARTHED

If the unit is subjected to extreme fluctuations 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 & REAR PANELS



FRONT PANEL

Display

The LCD display features a large graphics area, with titles for the 4 menu switches at the left hand end. The main graphics area is divided into 2 halves. These can display either the composite equalization curves for channels A and B or the composite equalization curve for the selected channel and the particular equalization curve of the selected filter. These views are known as 'A & B' and '1 Ch.' respectively.

Numeric display

The 2 x 7 segment LED Numerical display gives the number of the last memory recalled.

Menu switches

Four menu switches allow selection of various functions, such as memory save and recall.

Rotary encoders

Three rotary encoders allow continuous adjustment of any selected functions or parameters. Primarily, the encoders are labeled 'FREQ', 'Q' and 'LEVEL' and are used for the adjustment of the parametric filter sections.

Bypass switch

This switch activates and deactivates a software bypass of the unit unless a filter is selected. If a filter is selected, hold the filter swiitch and press Bypass to bypass that filter only. With no filters selected, pressing and holding Bypass will start a countdown which will end with all filters being reset to default values. With a filter selected, pressing and holding Bypass will start a countdown which will end with just the selected filter resetting to default values. Release the Bypass at any time during this countdown to abort the process.

Filter selection switches

These two groups of eleven switches - a group for each channel - are used to select filters and functions for adjustment (single press) and to switch filters in and out of circuit (double press). They are also used for entering ASCII characters in Save and Password modes.

Headroom indicators

These continually detect the level at various points throughout the signal path. They indicate the amount of headroom available before clipping of the analogue to digital converter section. The clip LEDs also warn of clipping in the DSP.

POWER switch

This switch is used to switch the unit ON and OFF. When the unit is off, failsafe bypass relays route the audio inputs to outputs.

Power Socket

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

OUTPUTS A and B XLR sockets

These are electronically balanced for voltage and current.

INPUTS A and B XLR sockets

These are electronically balanced.

MIDI IN, OUT and THRU

Standard 5-pin DIN MIDI sockets for MIDI control.

DN60/6000 Port

Future software upgrade will support automatic equalisation functions by integration with the Klark Teknik DN6000 Audio Analyzer.

Cover plates

The DN4000 is ready to accept an AES/EBU format digital audio interface card, making the equalisation and the advanced digital conversion system available to complete digital signal chains.

The DN4000 will also accept various remote control interfaces under development by Klark Teknik.

Adjusting the EQ, Gain and Delay

To select an **EQ filter** for adjustment, press the appropriate filter selection switch beneath the display. Note that the switch LED starts to flash, and the display shows the various parameters for that filter.

Adjust the filter using the **rotary encoders**. For parametric filters (the bottom row of switches) you have access to the familiar Frequency, Q and Level; for the High and low pass filters, to Frequency and Slope; for low and high shelf filters, to Frequency and Level.

Note that the filter parameters and the frequency response curve change in real time.

Press the "**MODE**" soft switch at the left hand end of the display to access the 2 display modes. In 'A & B' mode, you see the frequency responses of channels A and B side by side. In '1 Channel' mode, you see the frequency response for the individual, selected filter beside the frequency response for the selected channel.

Once adjusted, or during adjustment, you can switch the filter into the signal path by holding the appropriate filter switch and pressing the **Bypass** switch. Any filter can be switched into or out of circuit by double pressing the appropriate filter switch.

If you select **Delay**, you will be able to adjust the delay for channel A with the left hand encoder, channel B with the right hand encoder, or both channels together with the center encoder.

If you select Delay, you can change the delay units by use of the fourth soft switch.

To store settings in a memory

Press the 'Memory' soft switch. Now press the 'Save' soft switch. The display shows the old name of the memory location, while the numerical LEDs show the memory number. The display also shows various functions for the three encoders: memory number (MEM NO), cursor move (⇐ ⇒) and character change (CHAR). The display also shows a set of ASCII characters associated with the filter select switches.

Rotate the memory number encoder to select the desired memory location. Also, if desired, rename the memory location by use of the cursor encoder, the character encoder, the filter select switches and the 'Shift' soft switch.

Note: You can cancel the save at any time by pressing the 'Exit' soft switch.

Press the 'Save' soft switch to confirm the save.

To recall a memory

Press the 'Memory' soft switch. The display shows the name of the memory location and the channel A and B frequency response curves, while the numerical LEDs show the memory number. Use the rotary encoder to select a memory by name or number for recall.

Note: You can cancel the recall at any time by pressing the 'Exit' soft switch.

Press the 'Recall' soft switch to confirm the recall. The new settings will then be loaded into memory.

To protect against unauthorised access

Press the 'Memory' soft switch. Now press the 'Lock' soft switch. The soft switches now give you the options of 'Full' and 'Partial' as well as 'Exit'.

Full lock prevent any adjustments to the unit. Press the Full soft switch. Now, if you wish, you can enter a password using the encoders and the filter selection switches.
Be careful! If you forget your password, you will not be able to unlock the unit!
You can cancel the lock procedure at any time by pressing the Exit soft switch. Press the Full switch again to complete the lock procedure.

Partial lock allows memory recall only. All other functions, with the exception of the Bypass switch, are inaccessible. Press the Partial soft switch. Now, if you wish, you can enter a password using the encoders and the filter selection switches.
Be careful! If you forget your password, you will not be able to unlock the unit!
You can cancel the lock procedure at any time by pressing the Exit soft switch. Press the Partial switch again to complete the lock procedure.

To unlock the unit, press the Unlock soft switch. This is only displayed when the unit is locked. You now have the option of entering the password via the rotary encoders and filter selection switches. Enter the password if there is one. Then press Unlock.

Linking channels and filters for Stereo operation

You can link pairs of individual filters and adjust them both together. Any parameter adjusted is automatically copied from one to the other, the master channel being the first one pressed (and held).

Press and hold the selection switch for one filter. While holding the first switch, press the selection switch for the same filter on the other channel. Now the filters are linked. Any adjustments made with the rotary encoders or Bypass switch will affect both.

If another filter is selected or the current filter is deselected, the link is cancelled.

You can also link channels A and B together for stereo operation. Press the "Mode" soft switch. Now select "Link: On". Any changes made to one channel are automatically copied across to the other channel. To cancel the link, just press "Mode" again and select "Link : Off".

MIDI operation

Press the MIDI soft switch.

To adjust or view the MIDI transmit settings: Use the right hand rotary encoder to select whether the unit will transmit program changes only, or transmit nothing. Use the centre rotary encoder to select the channel for transmission.

Note: you can cancel the changes made at any time by pressing the Exit soft switch.

Press the MIDI TX soft switch to confirm the changes.

To adjust or view the MIDI receive settings, press the MIDI RX soft switch. Use the right hand rotary encoder to select whether the unit will receive program changes only, or receive nothing.

Use the middle rotary encoder to select the channel for reception, including OMNI mode, in which all channels are received.

Note: you can cancel the changes made at any time by pressing the Exit soft switch.

Press the MIDI RX soft switch again to confirm the changes.

Midi Bulk Dump

To send a Midi bulk dump, press the "**Bulk Dump**" soft switch, then prepare the receiving device. To initiate the dump, press "**Bulk Dump**" again. The DN4000 will transmit all settings for all memories in a single Midi System Exclusive message.

The DN4000 can receive a Bulk Dump at any time via its Midi input. No set up is necessary.

Display adjustment

Press the Utilities soft switch. Press the Grid soft switch to enable or disable the horizontal grid lines on the graphic display area. Press the Scale soft switch to enable or disable the frequency scale on the graphic display area.

To adjust the display brightness and contrast, press the LCD soft switch. Now use the left hand encoder to adjust display brightness, the middle encoder to adjust display contrast (viewing angle) and the right hand encoder to invert the display colours (light on dark to dark on light).

Press the Exit soft switch to leave the display adjustment menus.

SPECIFICATIONS

INPUTS	**TWO**
Type	Balanced (electronically)
Impedance (ohm)	
Balanced	20k
Unbalanced	10k
Common mode rejection (1KHz)	>70dB
Max. Level	+21dBu
OUTPUTS	**TWO**
Type	Balanced (electronically)
Min. load impedance	600ohm
Source impedance	50ohm
Max. level	+21dBu into >2kohms
PERFORMANCE	
Frequency response with EQ flat	+/-0.3dB (20Hz to 20KHz)
Distortion @ +4dBu	<0.02% (20Hz to 20KHz)
Dynamic range (20Hz to 20KHz unweighted)	>112dB
POWER REQUIREMENTS	
Voltage	90 to250v @ 50 to 60 Hz AC
Consumption	<35VA
DIMENSIONS	
Width	483mm (19 inches)
Height	66mm (3.5 inches)
Depth	287mm (12 inches)
WEIGHT	
Net	6kg
Shipping	8kg