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In the interests of product development, Drawmer reserve the right to modify or improve specifications of this product at any time, without prior notice.
DRAWMER DS404
Quad Noise Gate

SAFETY CONSIDERATIONS

CAUTION - MAINS FUSE
TO REDUCE THE RISK OF FIRE REPLACE THE MAINS FUSE ONLY WITH THE
SAME TYPE, WHICH MUST BE A CLASS 3, 230 VOLT, TIME DELAY TYPE, RATED
AT 125mA WHERE THE MAINS INPUT VOLTAGE SWITCH IS SET TO 230 VOLTS
AC. AND 250mA WHERE THE MAINS INPUT VOLTAGE IS 115 VOLTS AC. ALL
FUSES MUST COMPLY WITH IEC127-2. THE FUSE BODY SIZE IS 20mm x 5mm.

CAUTION - MAINS CABLE
DO NOT ATTEMPT TO CHANGE OR TAMPER WITH THE SUPPLIED MAINS CABLE.

CAUTION - SERVICING
DO NOT PERFORM ANY SERVICING. REFER ALL SERVICING TO QUALIFIED
SERVICE PERSONNEL.

WARNING
TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS
EQUIPMENT TO RAIN OR MOISTURE.

INSTALLATION

This product is designed for standard 19" rack mounting and occupies 1U of rack
space. Use four M6 pan head screws to secure the unit into the rack. Fibre or plastic
washers may be used to prevent the front panel becoming marked by the mounting
bolts.

- Care should be taken in the choice of positioning. The unit should not be
  mounted where other equipment obstructs the normal air flow. The unit
  should not be situated near any heat source, such as a radiator, stove or a high
  power amplifier that would generate heat.

- The DS404 should not be operated near any water or in a location where
  moisture might be present.
INTRODUCTION

The DS404 Quad Noise Gate has been designed to the highest specification to complement the DS201 Dual Noise Gate, acknowledged as the 'industry standard' gate throughout the world. Recognizing that there are many general gating applications which require equipment that is simple to operate, Drawmer have designed the DS404 Quad Noise Gate utilizing unique 'Programme Adaptive' circuitry. This makes the DS404 ideally suited for use over a wide range of input signals, ranging from drums and other percussive instruments through to vocals, pianos and even complete mixes.

Facilities include:

Frequency Sensitive.
The provision of variable Low-Pass and High-Pass Filters allows 'without compromise' frequency selective gating. The unit can be switched for either Internal or External Key source and the KEY LISTEN facility enables monitoring of the filter setting.

Hard/Soft Gating.
Each channel can be operated as a HARD or SOFT gate, providing quite different characteristics. Two coloured LEDs clearly indicate mode status. In the HARD mode the DS404 offers ultra-fast response time, stable triggering with complete freedom from chatter around threshold and a specialized release contour which is ideally suited to drums and other percussive material.
In the SOFT mode the DS404 becomes a versatile Expander capable of handling vocals and sub mixes. Drawmer's unique 'Programme Adaptive' circuitry is used to optimise the attack time and ratio as well as having some effect on the manual release setting. A more gentle release characteristic is utilized to complement the SOFT gate.

Fully variable threshold.
Range from +20dB to -70dB.

Fully variable release control.
From 10 ms to 5 sec to ensure maximum envelope control.

Chain Linking.
Operating the LINK control switches the channel on the right to SLAVE operation, where its gating mode, threshold and envelope characteristics are controlled by the MASTER (left) channel. Any adjacent three channels or two stereo pairs can be linked in this way for use in any conceivable situation where linking may be required.

LED Displays.
Drawmer's familiar "traffic light" LED display gives a clear indication of gate status.

Balanced inputs and outputs on XLR connections.
AUDIO CONNECTIONS

Both the input and output XLRs may be used either balanced or unbalanced, the wiring convention being: pin 1 ground, pin 2 hot and pin 3 cold. For unbalanced operation, connect pin 3 to ground for both inputs and outputs, (best achieved inside the actual XLR connector). The key inputs are unbalanced ¼" jack sockets.

If earth loop problems are encountered, disconnecting the mains earth is not recommended, but instead, try disconnecting some or all of the signal screens on the cables connecting the DS404 to the patchbay. If such measures are necessary, balanced operation is advised.

POWER CONNECTION

The unit will have been supplied with a power cable suitable for domestic power outlets in your country. For your own safety it is important that you use this cable. The unit should always be connected to the mains supply earth using this cable, and no other.

If for some reason the unit is to be used at a mains input operating voltage which is different to that as supplied, the following procedure must be carried out.

1: Disconnect the unit from the mains.
2: Remove the two self-tapping screws that hold the voltage selection switch cover-plate onto the rear panel.
3: Remove the cover plate and slide the switch fully to its opposite end.
4: Rotate the cover plate one half turn, (180°) and refit the two screws.
5: Replace with a correctly rated fuse for the selected operation voltage.
6: Re-connect to mains power source.

Never disconnect the earth from the mains supply
CONTROL DESCRIPTION

All four channels of the DS404 are identical and may be used completely independently or linked for multi-channel operation. In the linked mode, only the left most channel’s controls are functional and serve as master controls, though the channel bypass switches remain independent. When linked, the control signal is derived only from the programme material present at the input of the master channel.

**Threshold**  
Sets the level below which gating starts to take place and may be set in the range -70dB to +20dB.

**Display**  
The famous Drawmer “traffic light” display shows gate status:

- ☀️ ☀️ ☀️ ☀️ ☀️ ☀️ ☀️
- Gate Closed  Hold Time  Gate Open

**Release**  
10mS to SS.  
Additionally, some envelope hold time is built into the system which varies with the release time. This prevents chatter when processing material with inconsistent decay characteristics and is quite invisible to the user.

**Range**  
Determines how much gain reduction is applied when the gate is fully closed. A setting of -90dB effectively silences the signal completely, while the -20dB setting will still allow an attenuated version of the signal to pass through. We recommend this switch is left in the -90dB (out) position.

For signals with a high levels of background noise, the very fact of closing down to -90dB can be disconcertingly noticeable. In such cases the -20dB switch setting can achieve better results.

*Note: This control is active on both channels, even in stereo linked operation.*
Key Listen / Gate / Bypass

When this switch is set to Key Listen, the effect of the key filters on the programme material is heard at the output. In normal operation, the Gate position is selected; the filters only affect the way the DS404 responds to the incoming programme material - they do not have any direct effect on the output signal. The Bypass position routes the input signal to the output with no processing.

Note: It is possible to leave the switch in the Key Listen position in order to use the DS404 simply as a filter rather than a gate.

L.F.  
25Hz - 10kHz
The Low Frequency filter works by severely attenuating frequencies below the cut-off frequency selected.

H.F.  
200Hz - 35kHz
The High Frequency filter attenuates frequencies above the selected cut-off value.
In other words, when both filters are set, it is the range between the two settings that is allowed to pass.

Key/Int  
In the Int position, this switch causes the gate to respond to the dynamics of the signal being processed.
In the Key position, an external audio signal fed to the key input is used to control the gate, making it possible to gate one sound using another, independent signal.

Hard/Soft  
This button selects between the Hard and Soft modes of operation. In the Hard mode, the DS404 behaves as a fast, conventional gate while in Soft mode, it performs as a programme adaptive expander. Hard mode is signified by a red status LED while the Soft mode is identified by a yellow LED. If two or more channels are linked, the mode is determined by the master (left most) channel and the Hard/Soft LEDs on the slave channel(s) will extinguish.

Slave Link  
The Link buttons are located between channels, and when depressed, cause the channel on the right to be controlled by the left hand channel. Two, three or four channels may be linked, (or two pairs), the left most channel always being the master. In linked mode, the red status LED beneath the Slave Link switch will be illuminated, and both the yellow and red HARD/SOFT LEDs of the slave channel will be extinguished. This assists to show that the only controls of the slave channel that still function are the Key Listen / Gate / Bypass switch and the Range switch.
OPERATION

Use the following diagrams as a guide to using the DS404.

Typical Setup

Operation: Gating a Snare Drum

```
1 kHz  2 kHz  Input Level Dependant  50 mS
```

Operation: Gating Toms

```
200 Hz  500 Hz  Input Level Dependant  0.1 S
```

Operation: Gating Vocals

```
25 Hz   35 kHz  Input Level Dependant  0.5 S
```

Key

Set the knob to the position shown.

- **Switch is Out**
- **Switch is In**
- **Set to User Preference**
Triggering a Bass Guitar from a Kick Drum

Cable Wiring Diagram

To Bass Channel Insert

Desk

DS404

To Kick Drum Channel Insert

Ch1 Kick Drum

Ch2 Bass
Adding Depth to a Kick Drum

<table>
<thead>
<tr>
<th>KEY SOURCE</th>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANNEL 1</td>
<td>EXT</td>
<td>OUT</td>
</tr>
<tr>
<td></td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GATE</td>
<td></td>
</tr>
<tr>
<td>KEY SOURCE</td>
<td>INPUT</td>
<td>OUTPUT</td>
</tr>
<tr>
<td>CHANNEL 2</td>
<td>EXT</td>
<td>OUT</td>
</tr>
<tr>
<td></td>
<td>IN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GATE</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FILTER HP</th>
<th>THRESHOLD</th>
<th>RELEASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW</td>
<td>HIGH</td>
<td></td>
</tr>
</tbody>
</table>

- **250 Hz**
- **2 kHz**
- Input Level Dependant: **50 mS**
- **25 Hz**
- **35 kHz**
- Linked: **Linked**

**Low Frequency Tone from Oscillator or Synth**

![Amplifier diagram with connectors and gain knobs]
Gating all Four Channels using Channel 1 as the Trigger

Use this setup to synchronize starts and stops on vocals, brass sections etc.
IF A FAULT DEVELOPS

For warranty service please call Drawmer Electronics Ltd. Or their nearest authorised service facility, giving full details of the difficulty. On receipt of this information, service or shipping instructions will be forwarded to you. No equipment should be returned under the warranty without prior consent from Drawmer or their authorised representative.

For service claims under the warranty agreement a service Returns Authorisation (RA) number will be given. Write this RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem.

Authorised returns should be prepaid and must be insured. All Drawmer products are packaged in specially designed containers for protection. If the unit is to be returned, the original container must be used. If this container is not available, then the equipment should be packaged in substantial shock-proof material, capable of withstanding the handling for the transit.

CONTACTING DRAWMER

Drawmer Electronics Ltd., will be pleased to answer all application questions to enhance your usage of this equipment. Please address correspondence to:

Drawmer (Technical Help line) : Coleman St. : Parkgate : Rotherham : S62 6EL : UK

or, E-mail us on : tech@drawmer.com

Drawmer dealers, Authorised service departments and other contact information can be obtained from our web pages on http://www.drawmer.com
TECHNICAL SPECIFICATIONS

(All measurements reference +4dBu operating level)

INPUT IMPEDANCE  20KΩ (Balanced)
KEY INPUT IMPEDANCE  20KΩ (Unbalanced)
MAXIMUM INPUT LEVEL  +21dBu
MAXIMUM KEY INPUT LEVEL  +21dBu
OUTPUT IMPEDANCE  50 Ω (Balanced)
MAXIMUM OUTPUT LEVEL  +21dBu
BANDWIDTH  <10Hz to 22KHz -1dB
FLOOR LEVEL  -90dB, (or -20dB)

<table>
<thead>
<tr>
<th>ATTACK TIME</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard</td>
<td>&lt; 10 µS</td>
<td></td>
</tr>
<tr>
<td>Soft</td>
<td>100 mS</td>
<td>1 mS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RELEASE TIME</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard</td>
<td>10 mS</td>
<td>&gt; 5 Sec</td>
</tr>
<tr>
<td>Soft</td>
<td>100 mS</td>
<td>5 Sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOISE</th>
<th>Wideband</th>
<th>22Hz - 22KHz</th>
<th>CCIR ARM</th>
<th>IEC A</th>
<th>Q-Pk CCIR</th>
</tr>
</thead>
<tbody>
<tr>
<td>AV</td>
<td>-91dB</td>
<td>-97dB</td>
<td>-97dB</td>
<td>-100dB</td>
<td>-86dB</td>
</tr>
<tr>
<td>RMS</td>
<td>-89dB</td>
<td>-96dB</td>
<td></td>
<td>-99dB</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DISTORTION</th>
<th>100Hz</th>
<th>1KHz</th>
<th>10KHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gate Open with +4dBu input</td>
<td>&lt; 0.04%</td>
<td>&lt; 0.04%</td>
<td>&lt; 0.04%</td>
</tr>
</tbody>
</table>

POWER REQUIREMENTS  115Volt or 230Volt at 50-60Hz,  15 Watts
FUSE RATING  125mA for 230Volt,  250mA for 115Volt
CONFORMING TO IEC127-2
FUSE TYPE  20mm x 5mm, Class 3 Slo-Blo, 250Volt working
CASE SIZE  482mm (w) x 44mm (h) x 175mm (d)
WEIGHT (incl packaging)  3.7 Kgs