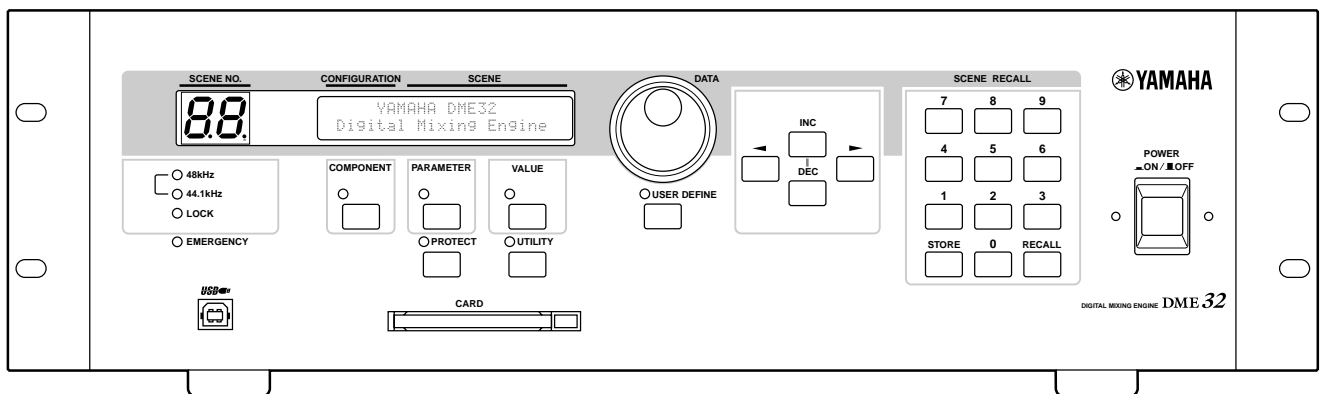




DIGITAL MIXING ENGINE

# DME 32

Owner's Manual



Keep This Manual For Future Reference.



## FCC INFORMATION (U.S.A.)

1. **IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!** This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.
2. **IMPORTANT:** When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.
3. **NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s. In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA 90620

The above statements apply **ONLY** to those products distributed by Yamaha Corporation of America or its subsidiaries.

**WARNING: THIS APPARATUS MUST BE EARTHED**

### IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW : EARTH  
BLUE : NEUTRAL  
BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured GREEN and YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  $\perp$  or coloured GREEN and YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

\* This applies only to products distributed by YAMAHA KEMBLE MUSIC (U.K.) LTD.

**ADVARSEL!**

Lithiumbatteri—Eksplodingsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandoren.

**VARNING**

Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

**VAROITUS**

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

## NEDERLAND

- Dit apparaat bevat een lithium batterij voor geheugen back-up.
- Raadpleeg uw leverancier over de verwijdering van de batterij op het moment dat u het apparaat aan het einde van de levensduur afdankt of de volgende Yamaha Service Afdeling:  
Yamaha Music Nederland Service Afdeling  
Kanaalweg 18-G, 3526 KL UTRECHT  
Tel. 030-2828425
- Gooi de batterij niet weg, maar lever hem in als KCA.

## THE NETHERLANDS

- This apparatus contains a lithium battery for memory back-up.
- For the removal of the battery at the moment of the disposal at the end of the service life please consult your retailer or Yamaha Service Center as follows:  
Yamaha Music Nederland Service Center  
Address: Kanaalweg 18-G, 3526 KL  
UTRECHT  
Tel: 030-2828425
- Do not throw away the battery. Instead, hand it in as small chemical waste.

---

# Important Information

---

## Read the Following Before Using the DME32

### Warnings

- Do not subject the DME32 to extreme temperatures, humidity, direct sunlight, or dust, which could be a potential fire or electrical shock hazard.
- Do not allow water to enter the DME32 or allow it to become wet. Fire or electrical shock may result.
- Do not place a container with liquid or small metal objects on top of this unit. Liquid or metal objects inside this unit are a fire and electrical shock hazard.
- Connect the power cord only to an AC outlet of the type stated in this *Owner's Manual* or as marked on the DME32. Failure to do so is a fire and electrical shock hazard.
- Hold the power-cord plug when disconnecting from an AC outlet. Never pull the cord. A power cord damaged through pulling is a potential fire and electrical shock hazard.
- Do not touch the power plug with wet hands. Doing so is a potential electrical shock hazard.
- Do not place heavy objects, including the DME32, on top of the power cord. A damaged power cord is a fire and electrical shock hazard. In particular, be careful not to place heavy objects on a power cord covered by a carpet.
- Do not scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.
- If the power cord is damaged (e.g., cut or a bare wire is exposed), ask your dealer for a replacement. Using the DME32 with a damaged power cord is a fire and electrical shock hazard.
- Do not plug several pieces of equipment into the same AC outlet. This may overload the AC outlet, and could be a fire or electrical shock hazard. It may also affect the performance of some equipment.
- If you notice any abnormality, such as smoke, odor, or noise, or if a foreign object or liquid gets inside the DME32, turn it off immediately. Remove the power cord from the AC outlet and consult your dealer for repair. Using the DME32 in this condition is a fire and electrical shock hazard.
- Do not place small objects on top of the DME32. Metal objects falling inside the DME32 is a fire and electrical shock hazard.
- If a foreign object or water gets inside the DME32, turn it off immediately. Remove the power cord from the AC outlet and consult your dealer for repair. Using the DME32 in this condition is a potential fire and electrical shock hazard.
- Should the DME32 be dropped or the cabinet be damaged, turn off the power, remove the power plug from the AC outlet, and contact your dealer. If you continue using the DME32 without heeding this instruction, fire or electrical shock may result.
- Do not remove the DME32's cover. You could receive an electrical shock. If you think internal inspection, maintenance, or repair is necessary, contact your dealer.
- Do not attempt to modify the DME32. This is a potential fire and electrical shock hazard.
- Do not block the DME32 ventilation slots. Blocking the ventilation slots is a potential fire hazard.

## Cautions

- Allow enough free space around the DME32 for normal ventilation. This should be 10 cm at the sides, 15 cm behind, and 30 cm above. These distances should also be adopted when rack-mounting the DME32. For normal ventilation during use, remove the rear of the rack or open a ventilation hole. If the airflow is not adequate, the DME32 will heat up inside and may cause a fire.
- Use the DME32 in an environment with a free-air temperature of between 10°C and 35°C (50°F and 95°F).
- Turn off all audio equipment when connecting to the DME32, and use only the cables specified in the relevant owner's manuals.
- If you plan not to use the DME32 for a long period of time, remove the power cord from the AC outlet. Leaving the DME32 connected is a potential fire hazard.
- Do not use benzene, thinner, cleaning detergent, or a chemical cloth to clean the DME32. Use only a soft, dry cloth.
- If the DME32 is stored in a cold place (e.g., overnight in a car), and then moved to a warmer environment, or the temperature rises sharply, condensation may form inside the DME32, which may affect performance. In such cases, the DME32 should be allowed to acclimatize for about one hour before use.
- When the wordclock source is changed on the wordclock master device (e.g., AD824 or DME32), noise may occur from the DME32's analog outputs, especially if an MY8-AT I/O card is installed, so turn down your power amps, or turn off the DME32 beforehand, otherwise any connected speakers may be damaged.
- If the DME32 displays the message "Warning Low Battery" when it's turned on, contact your Yamaha dealer as soon as possible and ask them to replace the internal backup battery. Although the DME32 will continue to work in this condition, any configuration data will be lost. It's recommended that you save any configuration data using DME Manager or a PC Card before replacing the battery.

## Interference

The DME32 uses high-frequency digital circuits that may cause interference on radio and television equipment located nearby. If interference is a problem, relocate the affected equipment.

## DME32 Exclusion of Certain Responsibility

Manufacturer, importer, or dealer shall not be liable for any incidental damages including personal injury or any other damages caused by improper use or operation of the DME32.

---

## Package Contents

The DME32 package contains the following items. Contact your Yamaha dealer if you are missing an item.

- DME32 Digital Mixing Engine
- CD-ROM (DME Manager software)
- 9-pin D-sub crossed cable (PC connection)
- 16-pin Euro-block plug (GPI interface)
- Power cord
- This manual

## Trademarks

ADAT MultiChannel Optical Digital Interface is a trademark and ADAT and Alesis are registered trademarks of Alesis Corporation. Intel and Pentium are registered trademarks and MMX is a trademark of Intel Corporation. Tascam Digital Interface is a trademark and Tascam and Teac are registered trademarks of Teac Corporation. Windows is a trademark of Microsoft Corporation. Yamaha is a trademark of Yamaha Corporation. All other trademarks are the property of their respective holders and are hereby acknowledged.

## Copyright

No part of the DME32 or DME Manager software or this *Owner's Manual* may be reproduced or distributed in any form or by any means without the prior written authorization of Yamaha Corporation.

© 2000 Yamaha Corporation. All rights reserved.

## Yamaha Web Site

Information about the DME32 and other Yamaha professional audio products is available on the Yamaha Professional Audio Web site at:

<<http://www.yamaha.co.jp/product/proaudio/homeenglish/>>.

---

# Contents

---

<b>1</b>	<b>Welcome</b>	<b>1</b>
	Welcome	2
	The DME32 in a Nutshell	2
	DME32 Features	4
	DME Manager Features	6
	About this Manual	7
	Installing the DME32	7
<b>2</b>	<b>Getting Started</b>	<b>9</b>
	First Steps	10
	Connecting to a PC	10
	Connecting the Power Cord	11
	Turning On & Off the DME32	11
	Installing DME Manager	12
	Upgrading & Reinstalling DME Manager	12
	Starting DME Manager	12
	Quitting DME Manager	13
	DME Manager & Windows	13
	Installing the USB Driver	13
	Checking the Driver is Installed Correctly	14
	USB Operating Notes	14
<b>3</b>	<b>Touring the DME32</b>	<b>15</b>
	Front Panel	16
	Rear Panel	19
<b>4</b>	<b>Touring DME Manager</b>	<b>21</b>
	Modes	22
	Main Window	23
	Configuration Windows	26
	Components	30
	Component Control Windows	31
	Run Mode Controller	33
	Other Windows	33
	Touring the Menus	34
	Component List	40
	Tool Palette	41
	Alt Menu	41
	Keyboard Shortcuts	42
<b>5</b>	<b>Building Configurations</b>	<b>43</b>
	How to Build & Edit Configurations	44
	Selecting Edit Mode	45
	Opening New Configuration Windows	45
	Opening Saved Configurations	46
	Selecting Open Configuration Windows	46
	Adding Components	47

---

Editing Components .....	48
Aligning Components to the Grid .....	49
Zooming Configuration Windows .....	50
Selecting Cable Mode .....	51
Adding Wires .....	51
Deleting Wires .....	56
Working with Multiple-Unit Configurations .....	58
Resizing Sections of the Configuration Window .....	59
Saving Configurations .....	60
Saving Configurations under a New Name .....	60
Closing Configurations .....	60
Compiling Configurations .....	61
Sending Configurations to the DME32 .....	62
Receiving Configurations from the DME32 .....	63
<b>6 Running the System .....</b>	<b>65</b>
Selecting Run Mode .....	66
Run Mode Controller .....	67
Editing Component Parameters .....	69
Storing Scenes .....	70
Recalling Scenes .....	72
Recalling Configurations .....	74
<b>7 Other DME Designer Functions .....</b>	<b>75</b>
Editing Scenes Offline .....	76
Linking Component Parameters .....	78
Customizing Component Properties .....	80
Changing the Size of Rotary Controls & Sliders .....	82
Using Password Protection .....	83
Assigning the User Define Button .....	86
Printing .....	87
<b>8 Component Guide Part I .....</b>	<b>89</b>
Automatic Mixer .....	90
Cascade .....	92
Crossover .....	93
Crossover Processor .....	102
Delay .....	120
Delayed Mixer .....	122
Dynamics .....	125
<b>9 Component Guide Part II .....</b>	<b>141</b>
Effect .....	142
EQ .....	162
Fader .....	165
Filter .....	166
Input/Output .....	170
Matrix Mixer .....	171
Meter .....	174
Misc .....	175

---

---

Pan .....	178
Router .....	187
Switch .....	189
User Control .....	190
User Module .....	193
<b>10 Front Panel Operation .....</b>	<b>197</b>
Recalling Configurations .....	198
Storing Scenes .....	199
Recalling Scenes .....	200
Editing Parameters & the User Define Button .....	201
Restricting Access to the DME32 .....	203
Selecting the Wordclock Source .....	209
Checking the I/O Slots .....	210
Initializing the DME32 .....	210
Checking the Firmware Version & Battery .....	210
<b>11 GPI Interface .....</b>	<b>211</b>
About the GPI Interface .....	212
GPI Connectors .....	212
Assigning GPI Inputs .....	214
Assigning GPI Outputs .....	217
Emergency Mode .....	220
<b>12 PC Cards .....</b>	<b>221</b>
PC Cards & the DME32 .....	222
Inserting & Ejecting PC Cards .....	222
Formatting PC Cards .....	223
Saving Configurations to PC Cards .....	224
Loading Configurations from PC Cards .....	225
Deleting Configurations from PC Cards .....	226
<b>13 Wordclocks .....</b>	<b>227</b>
Wordclocks & the DME32 .....	228
Wordclock Connections .....	229
Selecting the Wordclock Source .....	229
Wordclock Hookup Examples .....	231
Terminating BNC Wordclock Distribution .....	234
<b>14 Multiple DME32s .....</b>	<b>235</b>
About Multiple DME32s .....	236
Multiple-Unit System Notes .....	236
Cascade Connections .....	237
Multiple-unit Hookup Examples .....	238
<b>15 MIDI .....</b>	<b>241</b>
MIDI & the DME32 .....	242
MIDI Ports .....	242
MIDI Settings .....	242
Assigning Scenes & Configurations to Program Changes .....	244
Assigning Component Parameters to Control Changes .....	246

---



Component Parameters & Parameter Changes .....	248
Saving MIDI Settings .....	249
Loading MIDI Settings .....	250
Deleting MIDI Settings .....	250
<b>16 I/O Options .....</b>	<b>251</b>
I/O Options & the DME32 .....	252
I/O Card Specifications .....	253
Choosing I/O Cards .....	253
Installing I/O Cards .....	255
AD824 & DA824 Converters .....	256
<b>Troubleshooting .....</b>	<b>261</b>
DME32 .....	261
DME Manager .....	263
<b>Appendix A: General .....</b>	<b>265</b>
Component Title Table .....	265
DME32 Error Messages .....	270
DME Manager Error Messages .....	271
<b>Appendix B: Specifications .....</b>	<b>273</b>
Specifications .....	273
Control I/O .....	274
Connector Pin Assignments .....	274
DME32 Dimensions .....	277
<b>Appendix C: MIDI .....</b>	<b>279</b>
Program Change Assign Table .....	279
Control Change Assign Table .....	280
MIDI Data Format .....	283
<b>Glossary .....</b>	<b>287</b>
<b>Index .....</b>	<b>289</b>
<b>MIDI Implementation Chart</b>	

# Welcome

---

# 1

## In this chapter...

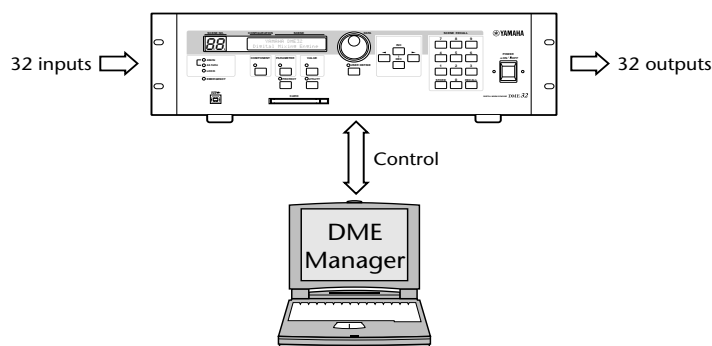
Welcome .....	2
The DME32 in a Nutshell .....	2
DME32 Features .....	4
DME Manager Features .....	6
About this Manual .....	7
Installing the DME32 .....	7

## Welcome

Thank you for choosing the Yamaha DME32 Digital Mixing Engine.

The DME32 Digital Mixing Engine and DME Manager software allow sound-system installers to custom build systems to meet the specific requirements of almost any installation. Entire systems from input through to output can be designed using DME Manager and then transferred to the DME32, which can then be used as a standalone processor. Typical applications include installed sound systems, submixing, loud-speaker system controllers, matrix/routing, and multi-effects processing.

## The DME32 in a Nutshell



DME32 audio systems, or *configurations* as they're known in DME32 terminology, are built in an intuitive “block diagram” style using Yamaha’s dedicated DME Manager software. Building configurations consists of adding the necessary components, wiring them together, compiling, and then transferring that information to the DME32, using either RS232/RS422, USB (Universal Serial Bus), or PC Cards.

Once programmed, the DME32 operates as a standalone processor and the PC can be disconnected, although it can be connected permanently in applications where real-time control from DME Manager is desirable. Even then, if the PC connection is lost for some reason, the DME32 just keeps on going.

Components form the building blocks in configurations. Some components are complete audio processors, such as mixers, compressors, effects, and crossovers, while others are individual parts, such as faders, switches, pan controls, and meters. System designers can create their own custom components using the User modules.

DME Manager operates in one of three modes: Edit, Cable, or Run. Edit mode is used mainly to build and edit configurations, although it can also be used to edit and preview scenes offline. Cable mode is for wiring components together. Run mode is used to control the DME32 system in real time, which includes editing component parameters, storing and recalling scenes, and recalling configurations. In Run mode, actions performed on DME Manager are reflected on the DME32 and vice versa.

The DME32 can store two configurations: A and B. Additional configurations can be stored on PC Cards. Each configuration can store up to 99 scenes, or snapshots of every component parameter setting in the configuration. Configurations and scenes can be recalled from the DME32 front panel, DME Manager, MIDI, or the GPI interface. Configurations and scenes can be titled from the PC keyboard for easy identification.

When operating as a standalone processor, various DME32 functions can be controlled from the front panel, including editing component parameters, storing and recalling

---

scenes, and recalling configurations. Direct access to a specific parameter is possible by assigning it to the [USER DEFINE] button. The large, two-digit scene number display indicates the current scene, while the 48-character LCD displays configuration and scene titles, component and parameter names, parameter values, and so on. Unauthorized operation can be prevented by using the password protection.

The DME32 offers 32 inputs and 32 outputs via four mini YGDAI card slots. Optional mini YGDAI (Yamaha General Digital Audio Interface) cards offer a variety of analog and digital I/O configurations, with support for all the popular digital audio interconnect formats, including AES/EBU, ADAT, and Tascam TDIF-1. Inputs and outputs can be expanded in multiples of 32 by cascading additional DME32s. Up to four DME32s can be cascaded, providing a maximum of 128 inputs and 128 outputs. Cascade components offer bus-like signal distribution in multiple-unit systems and can also be used for DSP power sharing between DME32s.

Superb sonic performance is achieved using 32-bit internal signal processing and a 48 kHz internal sampling rate. External sampling rates of between 39.69 kHz to 50.88 kHz are supported and can be set individually for each configuration.

Remote interaction between DME32 functions and custom-made controllers and other equipment is possible using MIDI and the GPI interface, which offers 16 assignable inputs and 16 assignable outputs. Scenes and configurations can be recalled using MIDI Program Change messages or the GPI interface. Component parameters can be controlled by using MIDI Control Change messages, System Exclusive messages, or custom-made controllers attached to the GPI interface.

See page 4 for a rundown of DME32 features, page 6 for DME Manager features.

## DME32 Features

### Sonic Performance

- 32-bit internal signal processing
- 48 kHz internal sampling rate
- 39.69 kHz to 50.88 kHz external wordclock

### Memories & Storage

- 2 configuration memories: A and B
- 99 scene memories per configuration
- Configurations and scenes can be titled from the PC keyboard for easy identification
- Store and transfer configurations on PC Cards

### Flexible I/O

- 32 inputs, 32 outputs via four mini YGDAI slots
- Optional mini YGDAI cards offer a variety of analog and digital I/O configurations, with support for all the popular digital audio interconnect formats, including AES/EBU, ADAT, and Tascam TDIF-1.
- Analog I/O options include the Yamaha AD824 8-channel 24-bit A/D converter and DA824 8-channel 24-bit D/A converter

### Control Ports

- Switchable RS232/RS422 serial port for PC connection
- RS422 allows cable lengths of up to one kilometer (15 meters for RS232)
- Convenient front panel USB port for PC connection
- COM port for AD824 head-amp gain control

### Multiple Units

- Cascade ports for multiple-unit operation with up to four DME32s
- I/O expansion in multiples of 32, with a maximum of four DME32s providing 128 inputs and 128 outputs
- 32 cascade buses allow bus-like signal distribution and power sharing between DME32s

### Remote Control

- Configuration and scene recall using MIDI Program Changes
- Component parameter control using MIDI Control Changes or System Exclusive
- GPI interface with 16 assignable inputs, 16 assignable outputs
- Emergency mode assignable to any GPI input

## Standalone Operation

- DME Manager can be disconnected once the DME32 has been programmed
- Dedicated keypad for scene store and recall
- Data wheel and INC/DEC buttons for component parameter editing
- Assignable [USER DEFINE] button for quick parameter access

## Others

- Large, 2-digit scene number indicator
- 48-character LCD display
- Password protection prevents unauthorized operation
- Wordclock I/O and switchable termination for master/slave operation
- 3U rack space

## DME Manager Features

### Components

- Processor components include crossovers, dynamics, filters, GEQ, PEQ, effects, etc
- Part-type components include faders, meters, switches, pan controls, etc
- Create custom components using User Modules
- Copy frequently used controls to custom control windows
- Customize the size of rotary controls and sliders

### Edit mode

- Drag and drop components onto configuration windows
- Use standard cut, copy, and paste commands to edit components
- Customize component appearance, including title, size, and color
- DSP power meter indicates approximate processor usage
- Align and snap components to the variable grid
- Zoom in to see components in detail or zoom out to see more of a configuration

### Cable Mode

- Wire components by dragging wires between input and output nodes
- Wire component nodes individually or in multiples

### Run mode

- Real-time control using DME Manager
- Edit component parameters, recall and store scenes, and recall configurations
- Actions performed on DME Manager are reflected on the DME32 and vice versa

### Offline Operation

- Build and edit configurations off-site
- Edit, title, and delete scenes offline
- Preview scenes offline

### Configurations & Scenes

- Title configurations and scenes from the PC keyboard
- Save configurations to any media available to Windows, including PC Cards
- Open multiple configurations simultaneously

### Easy Operation

- Drag rotary controls and sliders
- Set PEQ parameters by dragging points on an EQ curve
- Context-sensitive shortcut menu containing frequently used commands
- Floating tool palette and Alt-click mode menu for quick mode switching

## Other Features

- Up to 32 parameter-link groups for fader grouping, stereo signal control, or crossover frequency control in multiple-speaker systems
- Link parameters across cascaded DME32s
- 3-level password protection allows full access, limited access, or no access
- Print configuration information, including diagrams, component and parameter lists

## About this Manual

This *Owner's Manual* contains all the information you need in order to operate the DME32 Digital Mixing Engine and DME Manager. Use the table of contents to familiarize yourself with the organization of this manual and locate topics. Use the index to locate specific information. A glossary of DME32-related jargon is provided on page 287.

In this manual, the DME32 Digital Mixing Engine and DME Manager software are referred to as the “DME32” and “DME Manager” respectively. “PC” refers to an IBM PC-compatible computer running a Windows operating system.

## Installing the DME32

When mounting the DME32 in a rack, remove the DME32's feet and leave adequate ventilation space around the DME32 (at least 15 cm of free space behind). If the DME32 is mounted in a portable rack case, keep the rear of the case open when using the DME32 so as not to obstruct the free flow of air. Do not mount the DME32 above equipment that produces a lot of heat, such as a power amplifier.



---

# Getting Started

---

A large, light gray number '2' is positioned on the right side of the page, partially overlapping a solid black rectangular block.

## In this chapter...

First Steps .....	10
Connecting to a PC .....	10
Connecting the Power Cord .....	11
Turning On & Off the DME32 .....	11
Installing DME Manager .....	12
Upgrading & Reinstalling DME Manager .....	12
Starting DME Manager .....	12
Quitting DME Manager .....	13
DME Manager & Windows .....	13
Installing the USB Driver .....	13
Checking the Driver is Installed Correctly .....	14
USB Operating Notes .....	14

## First Steps

Here's how to get up and running with the DME32 system with the minimum of fuss.

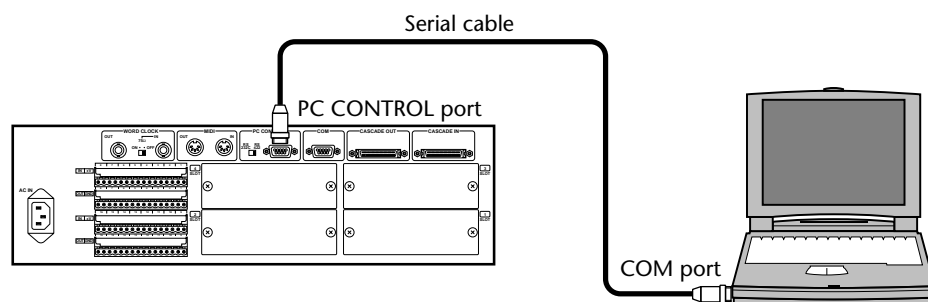
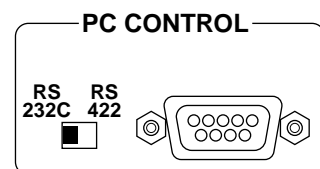
- 1 Familiarize yourself with the DME32.  
See “Touring the DME32” on page 15.
- 2 Install the required mini YGDAI I/O cards.  
See “I/O Options” on page 251.
- 3 Connect your audio sources and other equipment to the inputs and outputs.
- 4 Connect the DME32 to your PC.  
See “Connecting to a PC” on page 10.
- 5 Connect the power cord and turn on the DME32.  
See “Connecting the Power Cord” on page 11 and “Turning On & Off the DME32” on page 11.
- 6 Install DME Manager.  
See “Installing DME Manager” on page 12.
- 7 Start DME Manager.  
See “Starting DME Manager” on page 12.
- 8 Familiarize yourself with DME Manager.  
See “Touring DME Manager” on page 21.
- 9 Build a configuration.  
See “Building Configurations” on page 43.
- 10 Compile the configuration.  
See “Compiling Configurations” on page 61.
- 11 Transfer the configuration to the DME32.  
See “Sending Configurations to the DME32” on page 62.
- 12 Take the configuration for a run.  
See “Running the System” on page 65.

## Connecting to a PC

The DME32 can be connected to a PC by using standard RS232/RS422 serial connections or USB (Universal Serial Bus). When the DME32 receives a command via the serial port, it transmits a response to only the serial port. Likewise, when it receives a command via the USB port, it transmits a response to only the USB port.

### Serial Port

The PC CONTROL port features a switch for selecting RS232 or RS422. These two serial port standards are virtually the same, the main difference being that RS422 is balanced and therefore supports longer cable lengths. RS232 supports cable lengths of up to 15 meters, while RS422 supports lengths of up to 1 kilometer. Select the one that matches your PC's serial port.

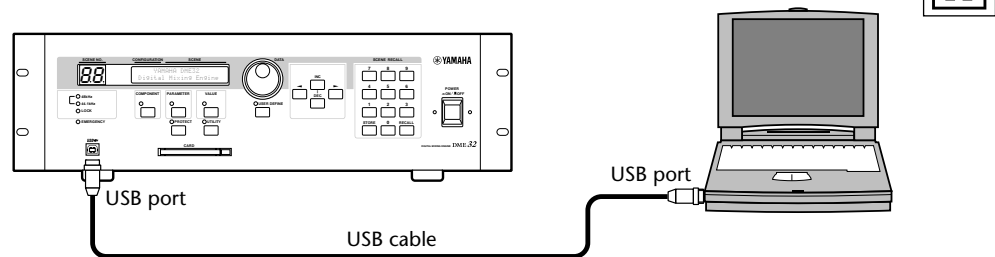


You can specify which COM port on your PC DME Manager uses, although you'll need to install DME Manager in order to do this. See "Installing DME Manager" on page 12 for more information. Using a text editor, open the "setup.ini" file in the DME folder. Change the COM parameter to match the number of the COM port you want to use. To use COM port 2, for example, the setting should be "COM2" (without quotation marks).

## USB

**Important:** You need to install the USB driver in order to use the USB port. See page 13.

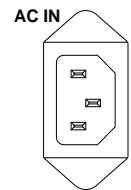
The front panel USB port is a convenient way to connect a PC to the DME32 and is ideal for systems where the DME32 rear panel is not easily accessible.



## Connecting the Power Cord

**Warning:** Turn off all equipment before making any power connections.

Connect the socket-end of the supplied power cord to the AC IN socket on the rear panel of the DME32. Connect the plug-end to a suitable AC wall outlet, one that conforms to the power supply requirements stated on the DME32 rear panel.



## Turning On & Off the DME32

To prevent loud clicks and thumps in your speakers, turn on your audio equipment in the following order (reverse this order when turning off your equipment)—sound sources, mixer or recorder (e.g., 02R, DME32, D24, etc.), power amplifiers.

- 1 To turn on the DME32, press the [POWER] switch.

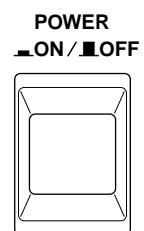
The following message appears for a few moments.

YAMAHA DME32  
Digital Mixing Engine

The number and title of the current configuration and scene appear on the display. The first parameter of the first component is selected, unless the [USER DEFINE] button has been assigned, in which case, the parameter assigned to that button is selected and the USER DEFINE indicator lights up.

When the DME32 is turned on for the first time, or when it's initialized, configuration memory A contains a simple configuration titled "Mtrx16." This configuration is stored inside the DME32 and can be overwritten by transferring another configuration from DME Manager.

- 2 To turn off the DME32, press the [POWER] switch.



## Installing DME Manager

### System Requirements

- A computer with a 200 MHz or faster Intel Pentium MMX processor or equivalent
- At least 32 MB of RAM (64 MB or more recommended)
- A hard disk with at least 20 MB of free space
- A CD-ROM or DVD-ROM drive (installation only)
- A VGA or better display (640 x 480, 256 color minimum)
- An RS232 or RS422 serial port or a USB port
- Windows 95/98

### Installing DME Manager

Before installing DME Manager, make sure that your PC meets the system requirements listed previously.

- 1 Turn on your PC and, if it's not running already, start Windows.  
The PC does not need to be connected to the DME32 in order to install DME Manager.
- 2 Insert the DME32 CD-ROM disc into your CD-ROM or DVD-ROM drive.  
If the Windows CD-ROM Autorun feature is turned on, the installation start up screen appears automatically.
- 3 Continue with the installation as prompted.  
If the Windows CD-ROM Autorun feature is not turned on, you must start the installation manually, as explained below.
- 4 Double-click the My Computer icon.  
The My Computer window opens.
- 5 Double-click the "DME32" CD-ROM icon.  
The installation start up screen appears.
- 6 Continue with the installation as prompted.  
When the installation process is complete, remove the CD-ROM disc from the CD-ROM drive and return it to its case for safe keeping.  
The installation program adds a DME item to the Windows Programs menu.

## Upgrading & Reinstalling DME Manager

Before upgrading or reinstalling DME Manager, you must delete the previously installed version as follows.

- 1 Use the "Add/Remove Programs" control panel to remove DME Manager.
- 2 Locate the "DME" folder and delete all the files inside it (do not delete the "AddIn," "Midi," or "Module" folders or the files inside them).  
Normally the "DME" folder is in "C:\Program Files."

## Starting DME Manager

- 1 Click the Windows "Start" button and select Programs, DME.  
DME Manager starts.  
When DME Manager is started, it checks whether any active DME32s are connected, active meaning connected and turned on. If an active DME32 containing configuration data is detected, a message asking whether or not you want to receive the configuration data appears. If you choose to receive it, all the configuration data in the DME32 is transferred to DME Manager and displayed in new configuration windows, and DME Manager switches to

Run mode. (See page 65 for more information on Run mode.) If you choose not to receive it, DME Manager starts up in Edit mode.

If no DME32s are detected, the message “DME32 not found!” appears. In this case you can click OK to continue using DME Manager offline in Edit mode. If a DME32 becomes available after DME Manager was started, a message asking whether or not you want to receive the configuration data appears. If you choose to receive it, all the configuration data in the DME32 is transferred to DME Manager and displayed in new configuration windows, and DME Manager switches to Run mode. See page 65 for more information on Run mode. (See page 65 for more information on Run mode.) If you choose not to receive the data, DME Manager continues in Edit mode.

Configuration data can be received from the DME32 by using the Data Transfer window. See “Receiving Configurations from the DME32” on page 63 for more information.

## Quitting DME Manager

- 1 Choose Exit from the File menu.

If no configuration windows contain unsaved changes, all configuration windows close and DME Manager quits.

If a configuration window contains any unsaved changes, a message asking if you would like to save the changes appears. Click OK to save the changes and quit, or click Cancel to cancel the operation.

- ✕ DME Manager can also be quit by clicking the Close button in the upper-right corner of the main window.

## DME Manager & Windows

When using DME Manager with Windows 98, component control-window movement may be a little erratic. To resolve this problem, in Windows 98, open the Display control panel and click the Effects tab, and then turn off the “Show window contents while dragging” option. If components and wires are displayed out of alignment, you can resolve the problem as follows: in Windows 98, open the Display control panel, click the Settings tab, and then click Advanced. Click the General tab, and then set the Display Font Size to “Small Fonts.” If you are using Windows 95, open the Display control panel, click the Settings tab, and then set Font to “Small Fonts.” You may be prompted to restart your PC.

## Installing the USB Driver

In order to use the USB port, you must install the USB driver as follows. For this you’ll need your DME32 CD-ROM, and you may be prompted to insert your Windows CD-ROM during installation, so keep it handy.

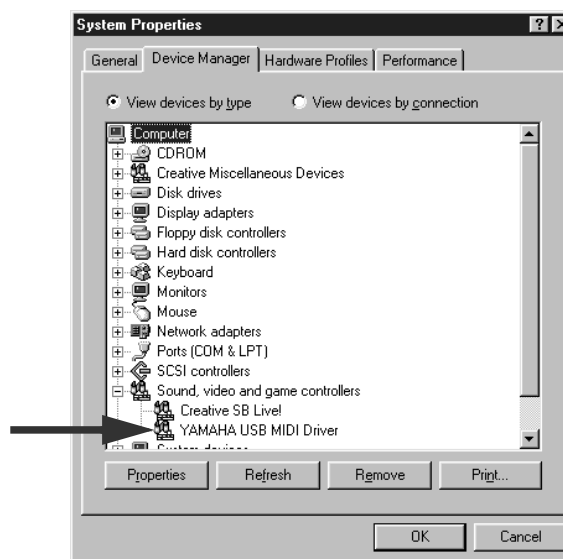
- 1 Turn on your PC.
- 2 With the DME32 turned off, connect it to your PC using the USB cable.
- 3 Turn on the DME32.  
After a few moments, the Add New Hardware Wizard appears. (If it doesn’t appear, try disconnecting and reconnecting the USB cable.)
- 4 Click Next.  
The next window asks “What do you want Windows to do?”
- 5 Select the “Search for the best driver for your device. (Recommended).” option, and then click Next.  
The next window asks you to specify the driver location.
- 6 Insert the DME32 CD-ROM into your CD-ROM/DVD drive.
- 7 Select “Specify a location” (unselect the other options), and then click Browse.

- 8 In the Browse for Folder window, select the “USBdrv\_” folder on the DME32 CD-ROM, and then click OK.
- 9 Click Next.  
The next window tells you that Windows has detected the driver and is now ready to install it. Make sure that the device is stated as “YAMAHA USB MIDI Driver.”
- 10 Click Next.  
Windows installs the driver.  
When the installation is complete, the “Windows has finished...” window appears.
- 11 Click Finish.  
Installation is complete.

## Checking the Driver is Installed Correctly

Follow the steps below to make sure that the driver has been installed correctly.

- 1 Right-click the My Computer icon and choose Properties.  
The System Properties window appears.
- 2 Click the Device Manager tab.  
The device list appears.
- 3 Check to see if “YAMAHA USB MIDI Driver” appears in the list, as shown right. If it does, the driver is installed correctly.
- 4 Click Cancel to close the Properties window.



## USB Operating Notes

If you turn on or off the power to the DME32, or connect or disconnect the USB cable under the following conditions, your computer may freeze, or some of the DME32 functions may be disabled:

- While the DME32 is being detected by Windows or its driver is being loaded.
- While Windows is starting or shutting down.
- When your computer is in standby mode.
- While an audio or MIDI program is starting.

In addition, the following may cause your computer to freeze or disable some DME32 functions:

- Turning the power on or off, or repeatedly connecting and disconnecting the USB cable.
- Entering or leaving standby mode during an audio or MIDI data transfer.
- Connecting or disconnecting the USB cable while the DME32 is turned on.
- Turning the power to the DME32 on or off, starting your computer, or installing the driver while a large amount of data is being transferred.

If you cannot shutdown Windows, try disconnecting the USB cable from the DME32.

If you cannot start Windows, turn off your computer, disconnect the USB cable, turn your computer on again, and then reconnect the USB cable.

# Touring the DME32

---

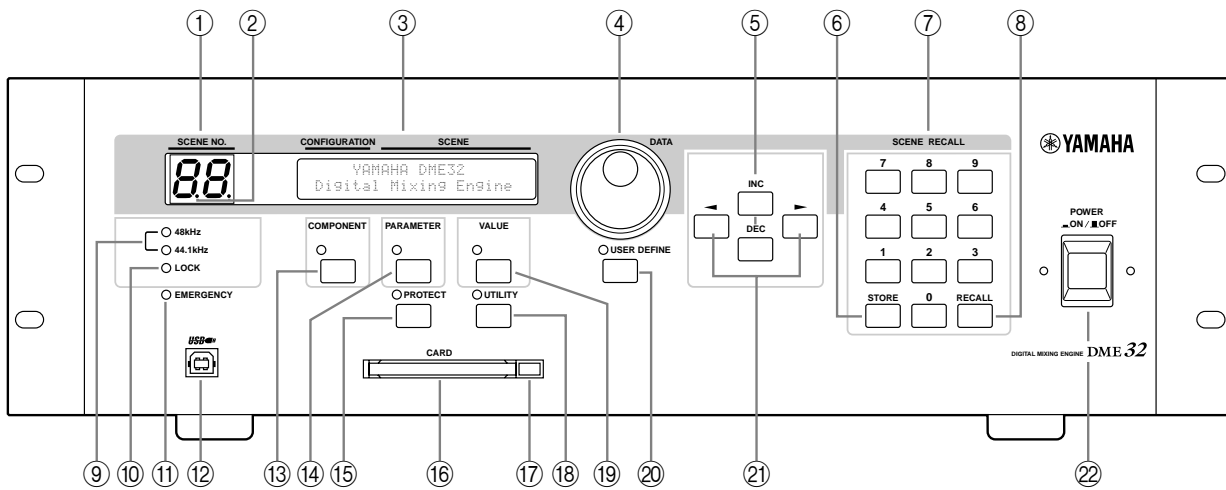
# 3



## In this chapter...

Front Panel .....	16
Rear Panel .....	19

## Front Panel



① **SCENE NO. indicator**

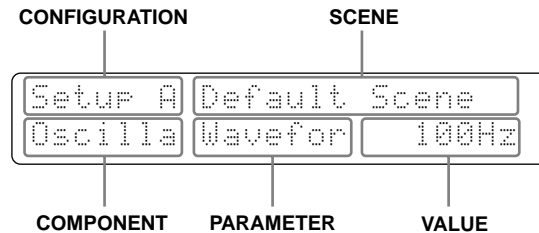
This 2-digit display shows the number of the current scene memory. The number flashes when a different scene memory is selected and stops flashing if that scene memory is recalled or stored.

② **Scene edit dots**

These two dots indicate whether or not the current settings match those of the last recalled scene memory. When a scene is recalled, both indicators go out. If a parameter is edited, they both light up, indicating that a parameter has been edited since the last scene was recalled.

③ **Display**

This 48-character LCD display shows information such as configuration and scene titles, component and parameter names, parameter values, functions, messages, and so on. It's divided into five sections—CONFIGURATION, SCENE, COMPONENT, PARAMETER, and VALUE—as shown in the following example.



④ **DATA wheel**

This wheel is used for selecting configurations, components, parameters, setting values, and making other settings. Turn it clockwise to increase a value; counterclockwise to decrease it.



- 
- ⑤ **INC & DEC buttons**

These buttons work in parallel with the DATA wheel and are used when selecting configurations, components, parameters, setting values, or making other settings. Use the [INC] button to increase a value; the [DEC] button to decrease it.
  - ⑥ **STORE button**

This button is used to store scenes. See “Storing Scenes” on page 199 for more information.
  - ⑦ **SCENE RECALL number keypad**

The number keypad is used to enter scene memory numbers from 1 to 99.
  - ⑧ **RECALL button**

This button is used to recall scenes. See “Recalling Scenes” on page 200 for more information.
  - ⑨ **48kHz & 44.1kHz indicators**

These indicators show the selected wordclock frequency: 48 kHz or 44.1 kHz. See “Selecting the Wordclock Source” on page 229 for more information.
  - ⑩ **LOCK indicator**

This indicator shows whether or not the DME32 is wordclock locked to the selected wordclock source. It lights up when the DME32 is wordclock locked. See “Selecting the Wordclock Source” on page 229 for more information.
  - ⑪ **EMERGENCY indicator**

This indicator lights up when the GPI input assigned to Emergency is activated. In Emergency mode, the DME32 mutes all outputs until the emergency condition is removed. See “Emergency Mode” on page 220 for more information.
  - ⑫ **USB port**

This USB port is used to connect the DME32 to a Windows PC and provides a convenient alternative to the PC CONTROL port on the rear panel. See “Connecting to a PC” on page 10 for more information.
  - ⑬ **COMPONENT button & indicator**

This button is used to select the COMPONENT section of the display. When pressed, the cursor moves to the COMPONENT section of the display and the COMPONENT indicator lights up. It’s also used with the utility functions.

This button can also be used to view a component’s full title on the DME32 display. Normally only the first seven characters of a component’s title are displayed. Pressing the [COMPONENT] button displays the full title by using the PARAMETER section of the display. Pressing the button again returns to the normal display.
  - ⑭ **PARAMETER button & indicator**

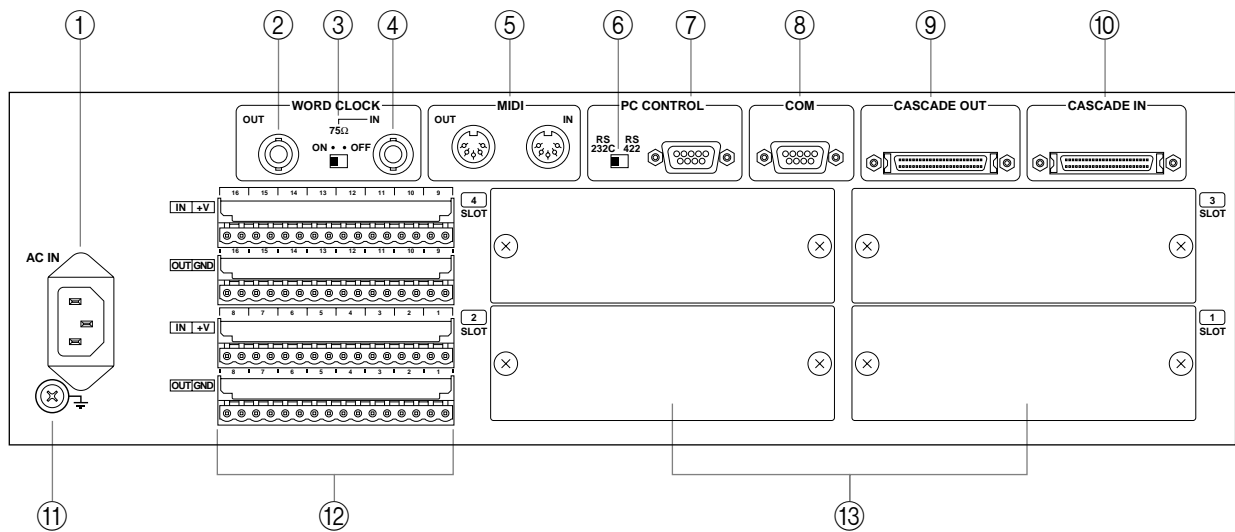
This button is used to select the PARAMETER section of the display. When pressed, the cursor moves to the PARAMETER section of the display and the PARAMETER indicator lights up. It’s also used with the utility and protection functions.
  - ⑮ **PROTECT button & indicator**

This button is used in conjunction with the protection functions, which can be used to restrict access to the DME32. The PROTECT indicator lights up when the [PROTECT] button is pressed. See “Restricting Access to the DME32” on page 203 for more information.
  - ⑯ **CARD slot**

Optional PC Card memory cards are inserted here for additional configuration and scene storage. See “PC Cards” on page 221 for more information.
-

- ⑰ **CARD eject button**  
This button is used to eject PC Cards. See “Inserting & Ejecting PC Cards” on page 222 for more information.
- ⑱ **UTILITY button & indicator**  
This button is used to access the utility functions. The UTILITY indicator lights up when the [UTILITY] button is pressed.
- ⑲ **VALUE button & indicator**  
This button is used to select the VALUE section of the display. When pressed, the cursor moves to the VALUE section of the display and the VALUE indicator lights up.
- ⑳ **USER DEFINE button & indicator**  
This button can provide direct access to a specified parameter. The USER DEFINE indicator lights up when the [USER DEFINE] button is pressed. See “Editing Parameters & the User Define Button” on page 201 for more information.
- ㉑ **Cursor buttons ( ◀ / ▶ )**  
These buttons are used to move the cursor around the display. The left ( ◀ ) cursor button moves the cursor to the left; the right ( ▶ ) cursor button moves it to the right.
- ㉒ **POWER switch**  
This switch is used to turn on the power to the DME32. See “Turning On & Off the DME32” on page 11 for more information.  
  
There are two M3 screw holes above and below the POWER switch, 34 mm apart, for attaching a protective cover. Yamaha does not offer such a cover, so it must be sourced by the user.

## Rear Panel



① **AC IN connector**

This connector is used to connect the DME32 to an AC outlet, using the supplied power cord. See “Connecting the Power Cord” on page 11 for more information.

② **WORD CLOCK OUT connector**

This BNC connector transmits the internally generated wordclock signal or the wordclock signal received at the WORD CLOCK IN when an external wordclock source is selected. See “Wordclock Connections” on page 229 for more information.

③ **WORD CLOCK 75Ω ON/OFF switch**

This switch is used to terminate the wordclock signal received at the WORD CLOCK IN. See “Wordclock Connections” on page 229 for more information.

④ **WORD CLOCK IN connector**

This BNC connector can be used to receive an external wordclock signal. See “Wordclock Connections” on page 229 for more information.

⑤ **MIDI IN & OUT ports**

These are standard MIDI IN and OUT ports and are used to connect the DME32 with other MIDI equipment for remote operation using MIDI Program Change, Control Change, and Parameter Change messages. See “MIDI & the DME32” on page 242 for more information.

⑥ **PC CONTROL RS232C/RS422 switch**

This switch is used to select the format for the PC CONTROL port. See “Connecting to a PC” on page 10 for more information.

⑦ **PC CONTROL port**

This 9-pin D-sub connector is used to connect the DME32 to the serial port on a Windows PC. See “Connecting to a PC” on page 10 for more information.

⑧ **COM port**

This 9-pin D-sub connector is used to connect the DME32 to a Yamaha AD824 AD Converter. See “AD824 & DA824 Converters” on page 256 for more information.

- ⑨ **CASCADE OUT port**  
This 50-pin half-pitch connector is used to cascade DME32s in a multiple-unit system. See “About Multiple DME32s” on page 236 for more information.
- ⑩ **CASCADE IN port**  
This 50-pin half-pitch connector is used to cascade DME32s in a multiple-unit system. See “About Multiple DME32s” on page 236 for more information.
- ⑪ **Ground terminal**  
For safety reasons it is important that the DME32 is grounded. The supplied power cord has a three-pin plug, and if the ground terminal of the AC outlet is grounded, then the DME32 will be grounded adequately via the power cord. If the AC outlet does not have a suitable ground terminal, a ground connection should be made to this ground terminal. Grounding is also an effective method for preventing hum, interference, and other noise.
- ⑫ **GPI connectors**  
These four Euro-block connectors make up the DME32’s GPI (General Purpose Interface), which allows interaction and remote control of DME32 functions using custom-made controllers and other equipment. See “GPI Interface” on page 211 for more information.
- ⑬ **SLOTS 1–4**  
These four slots are for use with optional mini YGDAI cards, which offer a variety of analog and digital I/O options. See “I/O Options” on page 251 for more information.

---

# Touring DME Manager

---

# 4

## In this chapter...

Modes .....	22
Main Window .....	23
Configuration Windows .....	26
Components .....	30
Component Control Windows .....	31
Run Mode Controller .....	33
Other Windows .....	33
Touring the Menus .....	34
Component List .....	40
Tool Palette .....	41
Alt Menu .....	41
Keyboard Shortcuts .....	42

## Modes

DME Manager has three operating modes: Edit, Cable, and Run. These can be selected from the Mode menu (see page 35), Shortcut menu (see page 39), Tool Bar (see page 24), Tool Palette (see page 41), or Alt menu (see page 41). The currently selected mode is displayed in the status bar. See “Status bar” on page 25 for more information.

### Edit Mode

Edit mode is used to build and edit configurations. It can also be used to edit scenes offline.

See “Building Configurations” on page 43 for more information.

### Cable Mode

Cable mode is used to wire components together.

See “Adding Wires” on page 51 for more information.

### Run Mode

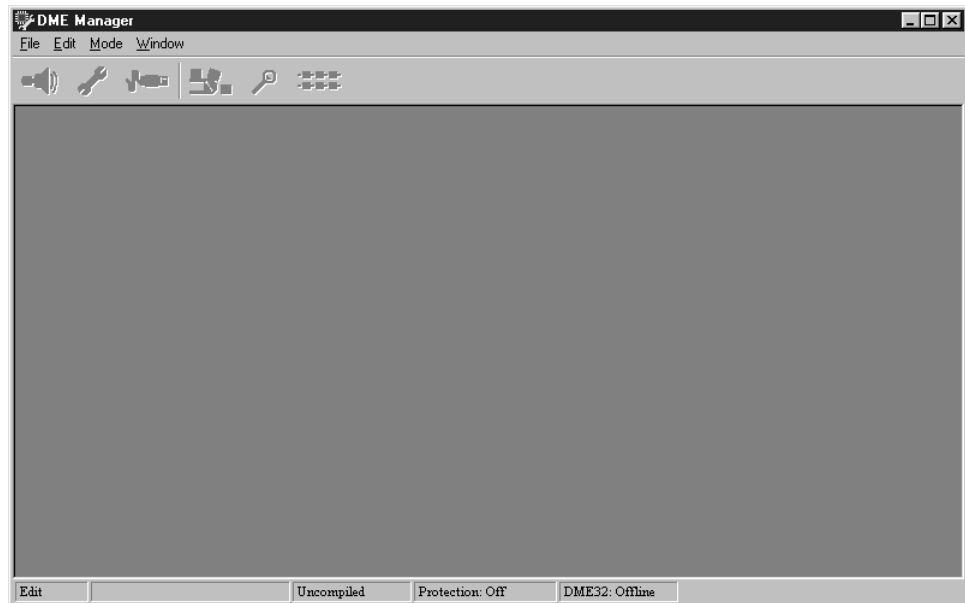
Run mode is used to control the DME32 system in real time, which includes editing component parameters, storing and recalling scenes, and recalling configurations. In Run mode, actions performed on DME Manager are reflected on the DME32 and vice versa. Components and wires cannot be edited in this mode.

See “Running the System” on page 65 for more information.

Configurations can be compiled and configuration data can be transferred between the DME32 and DME Manager in either Edit or Cable mode.

## Main Window

This is the main window in which configuration windows are managed. Normally you won't see this window appear like this because DME Manager always starts with a configuration window open, be it a new window or a window containing the configuration received from the DME32. If you close all configuration windows, however, you'll see the main window appear like this.



The main window can be minimized, maximized, and restored to its previous size by clicking the standard Windows buttons in the upper-right corner. Clicking the Close button quits DME Manager. The main window can be resized by dragging the lower-right corner. It can also be controlled using the commands in the control menu, which is accessed by clicking the program icon in the upper-left corner.

### Title Bar

The main window title bar displays information about the current configuration window, including configuration title and current scene number and title.

When no configuration windows are open, the title bar appears as follows.



When an unsaved configuration window is selected, the title bar appears as follows.



When the window for a configuration stored in the DME32 is selected, the configuration title is prefixed with the letter "A" or "B," as shown below.



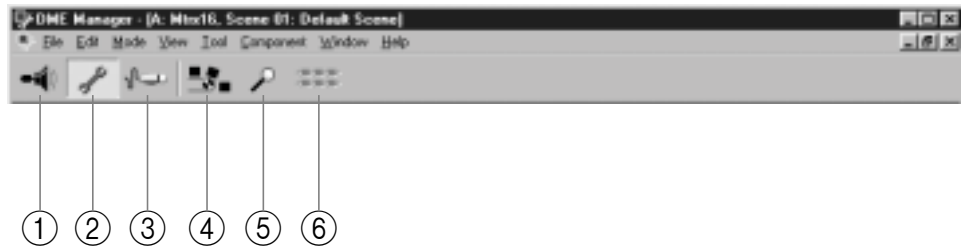
When the window for the currently running configuration is selected, the configuration title is prefixed with the word "Running," as shown below.



Note that when a configuration window is not at full size, the configuration and scene information shown in the above examples appears in the title bar of the configuration window, not the main window.

## Tool Bar

The Tool Bar provides convenient access to the Run, Edit, and Cable modes and the Compile, Zoom, and Align functions.

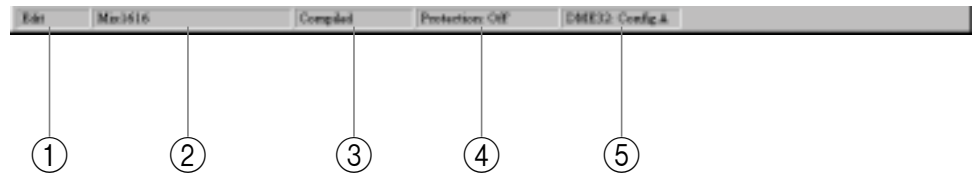


- ① **Run mode**  
This button selects Run mode. See “Run Mode” on page 22 for more information.
- ② **Edit mode**  
This button selects Edit mode. See “Edit Mode” on page 22 for more information.
- ③ **Cable mode**  
This button selects Cable mode. See “Cable Mode” on page 22 for more information.
- ④ **Compile**  
This button compiles the current configuration. See “Compiling Configurations” on page 61 for more information.
- ⑤ **Zoom**  
This button cycles through the Zoom settings: 25%, 50%, 75%, 100%, 150%. See “Zooming Configuration Windows” on page 50 for more information.
- ⑥ **Align**  
This button aligns all components to the grid. See “Aligning Components to the Grid” on page 49 for more information.



## Status bar

The status bar displays the current mode, the title of the current component, the compilation status, and the protection status.



① **Selected Mode**

This section displays the currently selected mode: Edit, Cable, or Run. See “Modes” on page 22 for more information.

② **Selected Component**

This section displays the title of the currently selected component.

③ **Compilation Status**

This section displays the compilation status of the current configuration: Uncompiled, Compiled, or Compile Failure. See “Compiling Configurations” on page 61 for more information.

④ **Protection Status**

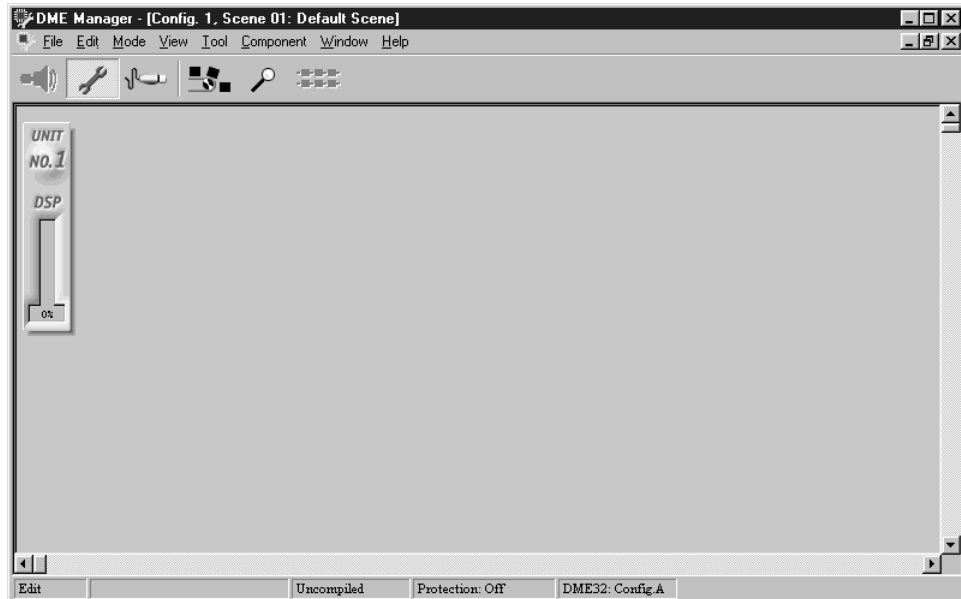
This section displays the protection status of the current configuration: Off, Component, or Operation. See “Using Password Protection” on page 83 for more information.

⑤ **DME32 Status**

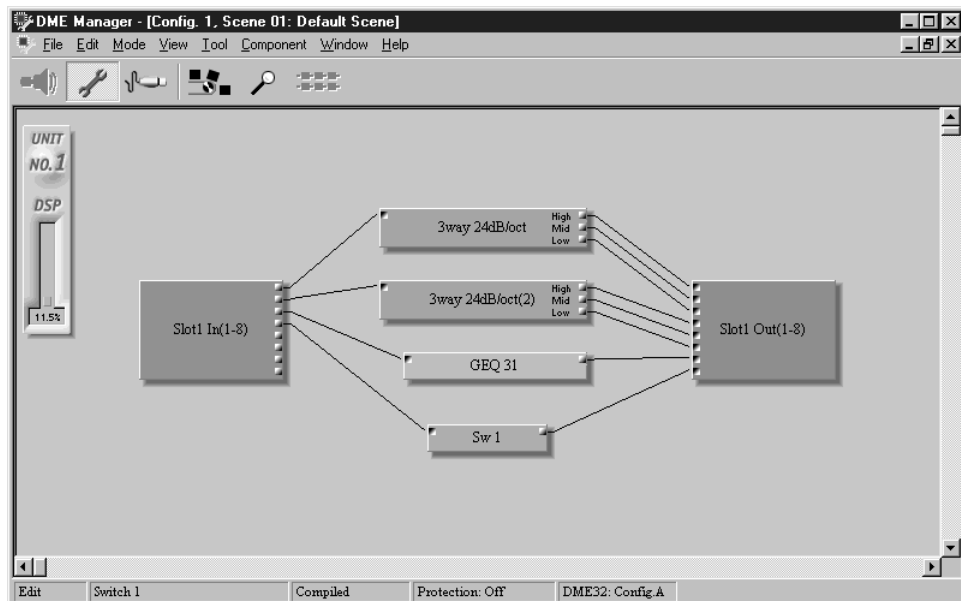
This section displays which configuration is currently selected on the DME32: “Config A” or “Config B.” If no DME32 is available, “Offline” appears.

## Configuration Windows

Configurations are built, wired, and controlled in configuration windows. See “How to Build & Edit Configurations” on page 44 for more information.

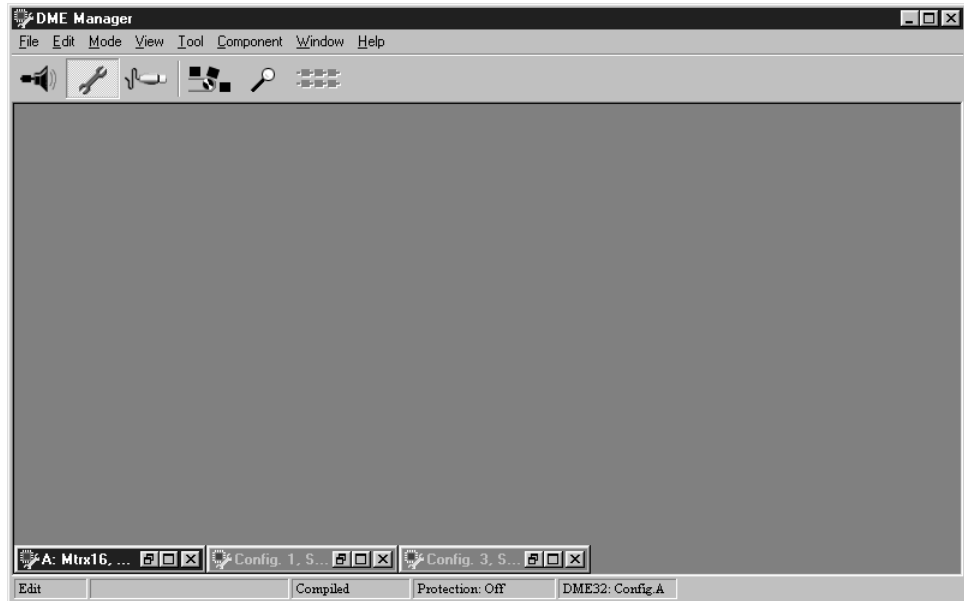


The following configuration window shows an example configuration.



Configuration windows can be minimized, maximized, and restored to their previous size by clicking the buttons in the upper-right corner of the configuration window. Clicking the Close button closes the configuration window. Configuration windows can be resized by dragging the lower-right corner. They can also be scrolled using the horizontal and vertical scroll bars. Windows can also be controlled using the commands in the control menu, which is accessed by clicking the program icon in the upper-left corner of the configuration window.

Minimized configuration windows appear along the bottom of the main window, as shown below.



Use the Restore and Maximize buttons to enlarge minimized configuration windows, or use the commands in the control menu, which is accessed by clicking anywhere on the configuration window's title bar, as shown below.



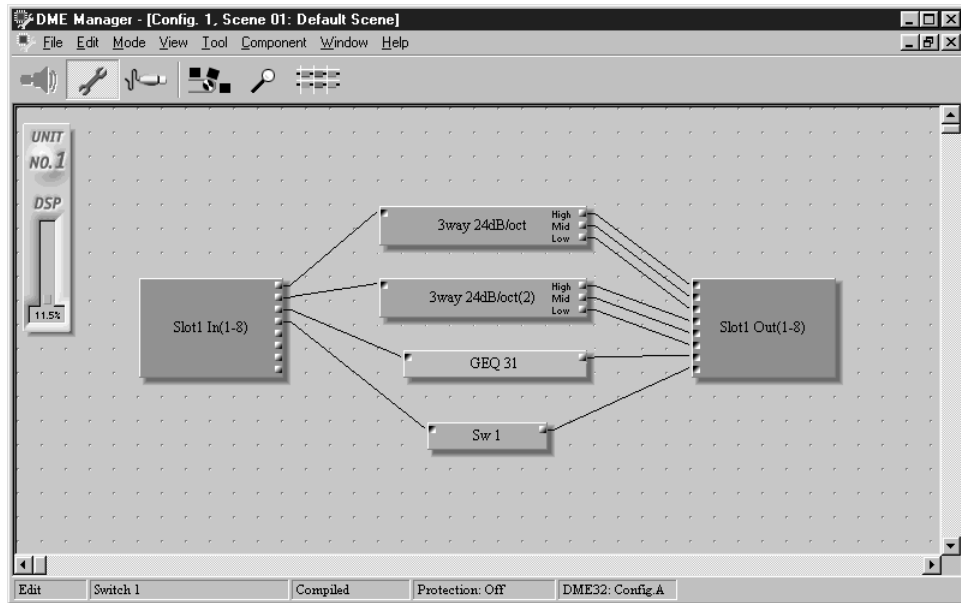
### DSP Power Meter

The DSP power meter displays the approximate amount of DSP processing power used by the configuration. There is one meter in each section of the configuration window, one for each DME32. Each meter starts at 0% and gradually rises as components are added. When the meter reaches 100%, all the DSP processing power has been used up and no more components can be added.



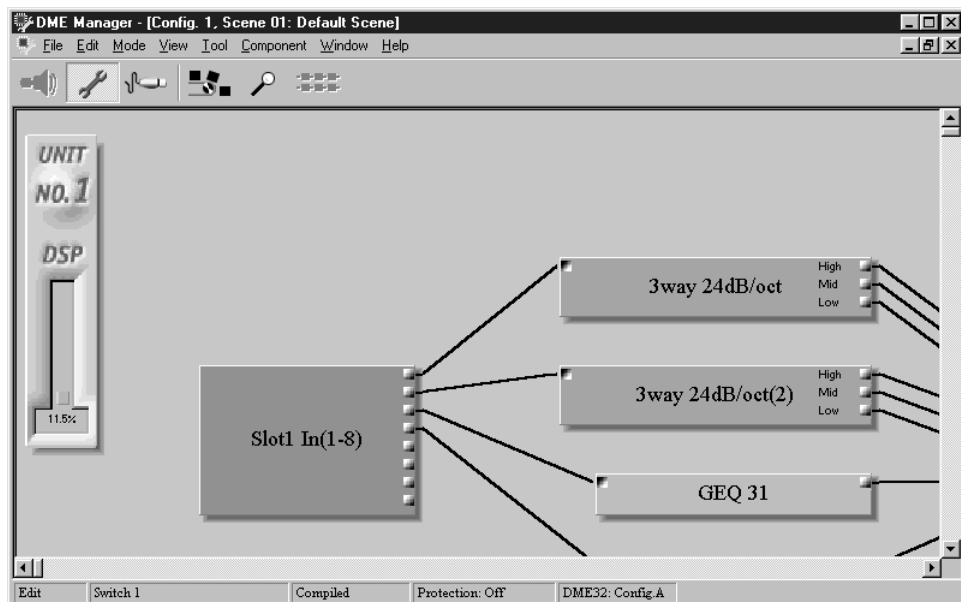
## Grid

Components can be aligned or snapped to a definable grid, as shown below. See “Aligning Components to the Grid” on page 49 for more information.



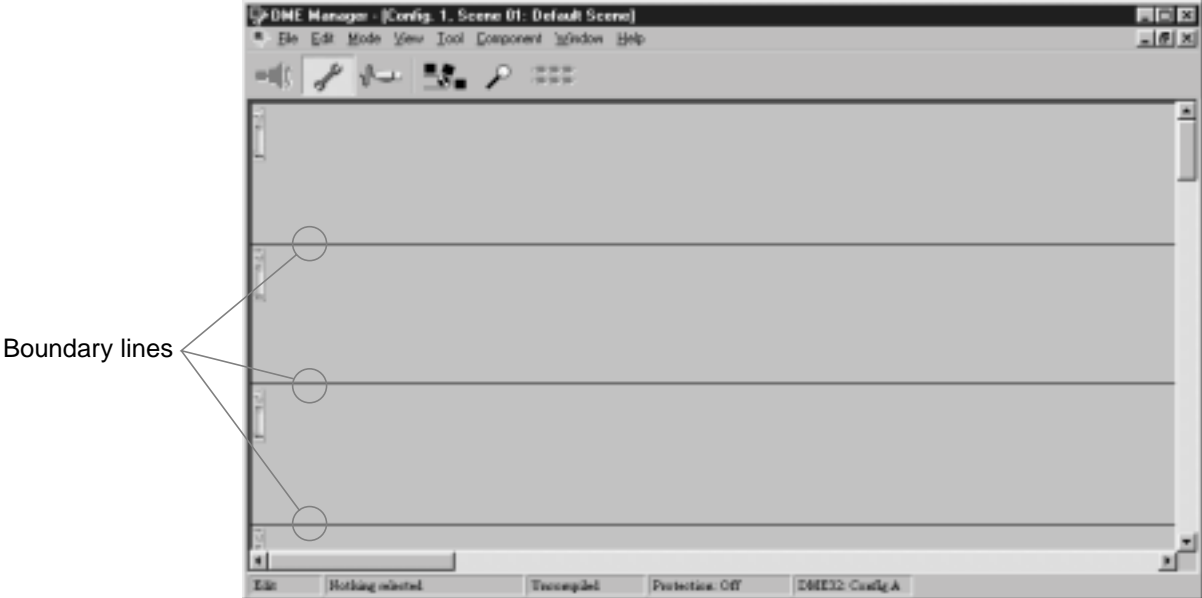
## Zoom

You can zoom in to see components in detail or zoom out to see more of a configuration by using the Zoom command. The following configuration window shows a configuration zoomed to 150%. See “Zooming Configuration Windows” on page 50 for more information.



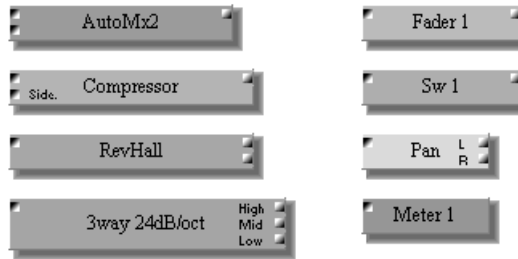
### Window Sections

Each configuration window is divided into four sections, one for each DME32. Sections can be resized by dragging the boundary lines shown below. See “Resizing Sections of the Configuration Window” on page 59 for more information.



## Components

Components are the building blocks for constructing DME32 audio systems. Some components consist of complete audio processors, such as mixers, compressors, effects, and crossovers, while others are individual parts, such as faders, switches, pan controls, and meters. A selection of components is shown below.



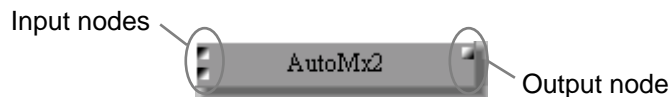
Two types of component essential to any configuration are the input and output components, like those shown below. These components represent the DME32’s physical inputs and outputs.



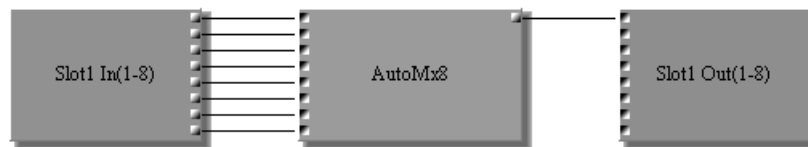
Components can be chosen from the Component menu, or dragged from the Component List. Components can be positioned simply by dragging. See “Adding Components” on page 47 for more information.

Components can be cut, copied, pasted, duplicated, aligned, or deleted using the various editing commands. See “Adding Components” on page 47 for more information.

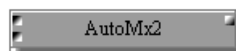
Most components feature input and output nodes, as shown below.



These nodes are used to wire components together, as shown below. See “Adding Wires” on page 51 for more information.



Components can be selected with a single mouse click. When a component is selected, it appears highlighted, as shown below.



Multiple components can be selected by clicking in a blank area next to one of the components to be selected and then dragging around the components to be selected.

Every component has a title. When more than one of the same component is added, the title of the newly added component is suffixed with a number. For example, if a second

Compressor is added to a configuration, its title is “Compressor(2),” as shown below. A third Compressor would be “Compressor(3),” and so on.

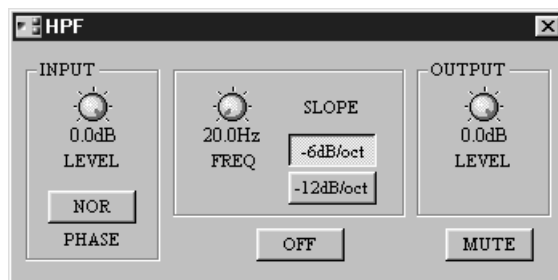


A component’s appearance, size, color, title, and so on, can be customized. See “Customizing Component Properties” on page 80 for more information.

Double-clicking a component opens its control window.

## Component Control Windows

Component parameters are adjusted on control windows, which typically feature rotary controls, sliders, buttons, and pop-up menus. Control windows are opened simply by double-clicking components. A typical control window is shown below.



Control windows can be closed by clicking the Close button in the upper-right corner. They can also be controlled using the commands in the control menu, which is accessed by clicking the program icon in the upper-left corner.

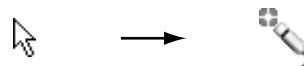
Not all components have a control window. Output components, for instance, don’t have any adjustable parameters, so they don’t have control windows.

Many of the interface items featured on a typical control window are the same as those found in typical Windows programs and require little explanation. The following sections explain control operation specific to DME Manager.

### Cursor

Control window items are operated by using the mouse, and can be adjusted by dragging, as in the case of rotary controls and sliders, or by clicking, if it’s a button or pop-up menu.

When Cable mode is selected, the cursor changes to the cable tool, as shown below.

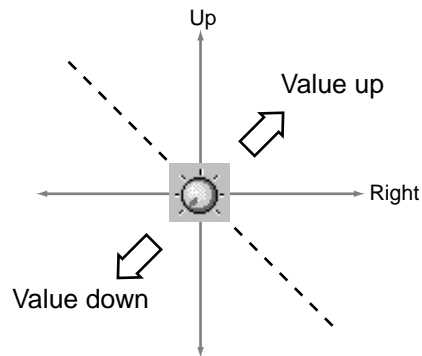


## Rotary Controls

Rotary controls are used to adjust continuously variable parameters, such as gain and frequency. A parameter's value is typically displayed below its control, as shown here.



Rotary controls are adjusted by dragging with either the left or right mouse button. Dragging a rotary control down or to the left causes the parameter value to decrease, while dragging up or to the right causes it to increase, as shown below.



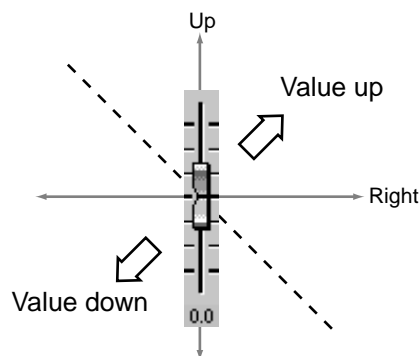
Rotary controls with a resolution of more than 1,000 steps, such as reverb initial delay, can be adjusted in intervals of 100 steps by dragging with the right-mouse button.

## Sliders

Sliders are used to adjust continuously variable parameters, such as channel level and graphic equalizer gain. The parameter's value is typically displayed below its slider, as shown here.



Sliders are adjusted by dragging with either the left or right mouse button. Dragging a slider down or to the left causes the parameter value to decrease, while dragging up or to the right causes it to increase, as shown below.

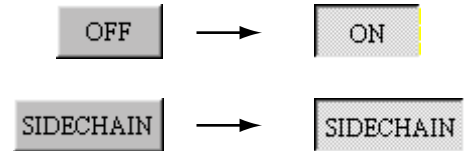


## Buttons

Like most programs, DME Manager features buttons that are used to execute and confirm functions, such as Save, OK, Cancel, and Enter. In addition to these, DME Manager also uses buttons to turn functions and parameters on and off.



The text labels on certain buttons change when the function or parameter is turned on or off, like the OFF/ON button shown here. Other buttons don't change text label and just appear depressed when a function or parameter is turned on, like the SIDECHAIN button shown here.



## Pop-up Menus

Pop-up menus, like the one shown here, are common in Windows programs and don't require further explanation.

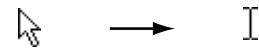


## Text Fields

Text fields are used to enter text, such as configuration and scene titles, or the title for the [USER DEFINE] button, as shown here.



When the mouse cursor is positioned over a text field, the cursor changes to the I-beam, as shown below. Text can be entered from the keyboard, or copied and pasted from elsewhere.



## Run Mode Controller

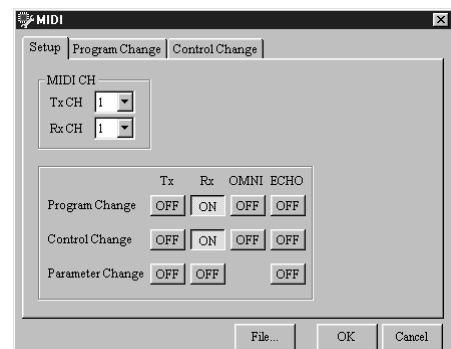
The Run Mode Controller appears when Run mode is selected. It's used to recall DME32 configurations and to store and recall scenes. See "Run Mode Controller" on page 67 for more information.



## Other Windows

In addition to control windows, DME Manager features various other windows, such as the MIDI window shown here. Parameters on this window are divided into three pages, which are accessed by clicking the Setup, Program Change, and Control Change tabs along the top.

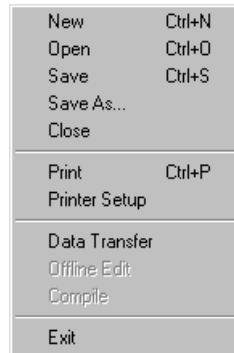
This type of window can be closed by clicking the Close button in the upper-right corner. This has the same effect as clicking Cancel. These windows can also be controlled using the control menu, which is accessed by clicking the program icon in the upper-left corner.



## Touring the Menus

### File Menu

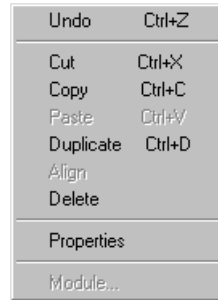
The File menu contains commands for managing configuration windows, printing, transferring configurations, offline editing, compiling, and quitting DME Manager.



Command	Description	See page
<b>New</b>	Creates a new configuration window	45
<b>Open</b>	Opens a previously saved configuration	46
<b>Save</b>	Saves the current configuration	60
<b>Save As</b>	Saves the current configuration under a new name	60
<b>Close</b>	Closes the current configuration	60
<b>Print</b>	Prints the current configuration	87
<b>Printer Setup</b>	Sets up the printer	87
<b>Data Transfer</b>	Sends and receives DME32 configurations	62, 63
<b>Offline Edit</b>	Opens the Scene Make window	76
<b>Compile</b>	Compiles the current configuration	61
<b>Exit</b>	Quits DME Manager	13

## Edit Menu

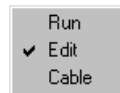
The Edit menu contains various commands for editing components and wires.



Command	Description	See page
<b>Undo</b>	Undoes the last component or wire edit	48, 51
<b>Cut</b>	Cuts the selected component and places it in the Clipboard	48
<b>Copy</b>	Copies the selected component and places it in the Clipboard	48
<b>Paste</b>	Pastes the component in the Clipboard	48
<b>Duplicate</b>	Duplicates the selected component	48
<b>Align</b>	Aligns all components to the grid	49
<b>Delete</b>	Deletes the selected component or wire	48, 56
<b>Properties</b>	Opens the Properties window for the selected component	80
<b>Module</b>	Opens the Module window	193

## Mode Menu

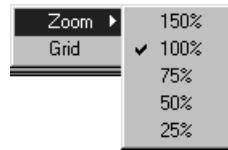
The Mode menu is used to select the Run, Edit, and Cable modes.



Command	Description	See page
<b>Run</b>	Selects Run mode	66
<b>Edit</b>	Selects Edit mode	45
<b>Cable</b>	Selects Cable mode	51

## View Menu

The View menu contains the Zoom and Grid commands.



Command	Description	See page
<b>Zoom</b>	Zooms the configuration window 150%, 100%, 75%, 50%, 25%	50
<b>Grid</b>	Opens the Grid window	49

## Tool Menu

The Tool menu contains system-related commands, such as User Define, MIDI, and Protection, and access to the Tool Palette.



Command	Description	See page
<b>User Define Button</b>	Opens the User Define window	86
<b>GPI</b>	Opens the GPI window	211
<b>MIDI</b>	Opens the MIDI window	241
<b>Word clock</b>	Opens the Word Clock window	229
<b>Tool Palette</b>	Opens the Tool Palette	41
<b>Protection</b>	Opens the Protection window	83

## Component Menu

The Component menu provides access to the Component List and Parameter Link windows and also lists all the available components.

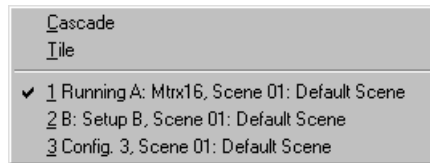


Command	Description	See page
<b>Component List</b>	Opens the Component List	40
<b>Parameter Link</b>	Open the Parameter Link window	78

The remainder of the Component menu lists all the available components. Components can be selected from the menu and added to configurations. See page 47 for information on adding components to configurations. See “Component Guide Part I” on page 89 and “Component Guide Part II” on page 141 for detailed information on all the components.

## Window Menu

The Window menu contains commands for managing configuration windows.

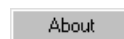


Command	Description	See page
<b>Cascade</b>	Cascades the open configuration windows	46
<b>Tile</b>	Tiles the open configuration windows	46

The remainder of the Window menu lists all the open configuration windows. Windows can be selected from the list, and the title of the current configuration window has a check mark next to it, as shown above. The configuration windows corresponding to the configurations in the DME32 are prefixed with the letters “A” and “B.” The currently running configuration is prefixed with the word “Running.” Also listed are configuration titles and current scenes and titles. See “Selecting Open Configuration Windows” on page 46 for more information.

## Help Menu

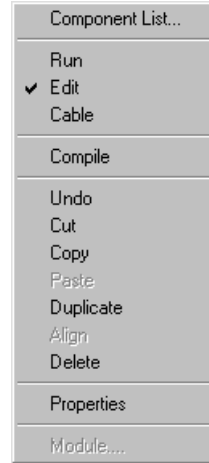
The Help menu contains the About command.



The About command displays information about DME Manager.

## Shortcut Menu

The Shortcut menu combines commonly used commands from several menus into one menu that can be accessed simply by clicking the right mouse button. It's a context-sensitive menu, which means that the commands available depends on the type of item (e.g., component or wire) that the cursor is over when the right mouse button is clicked.



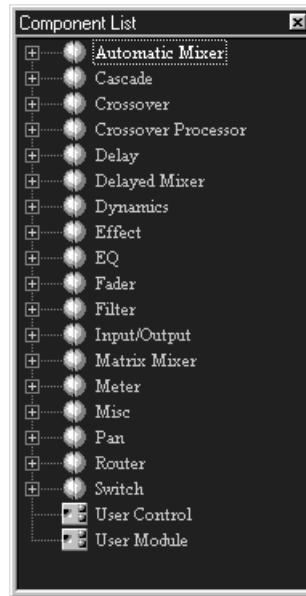
Command	Description	See page
<b>Component List</b>	Opens the Component List	40
<b>Run</b>	Selects Run mode	66
<b>Edit</b>	Selects Edit mode	45
<b>Cable</b>	Selects Cable mode	51
<b>Compile</b>	Compiles the current configuration	61
<b>Undo</b>	Undoes the last component or wire edit	48, 51
<b>Cut</b>	Cuts the selected component and places it in the Clipboard	48
<b>Copy</b>	Copies the selected component and places it in the Clipboard	48
<b>Paste</b>	Pastes the component in the Clipboard	48
<b>Duplicate</b>	Duplicates the selected component	48
<b>Align</b>	Aligns all components to the grid	49
<b>Delete</b>	Deletes the selected component or wire	48, 56
<b>Properties</b>	Opens the Properties window for the selected component	80
<b>Module</b>	Opens the Module window	193

## Component List

The Component List features a menu tree-style listing of all the available components. Individual components can be dragged from the list and added to the configuration. Components are organized into groups.

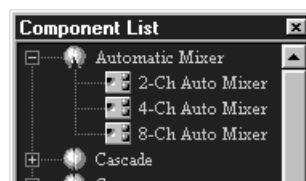
- 1 To open the list, choose Component List from the Component menu.

The Component List opens, as shown below.



- 2 To add a component to a configuration, select the component, and then drag it to the configuration window.
- 3 To see all the components within a group, click the plus (+) symbol next to the group title.

The individual components within the group are listed and the plus (+) symbol changes to a minus (–) symbol, as shown below.



- 4 To hide the individual component list, click the minus (–) symbol. The individual components within the group are hidden and the minus (–) symbol changes back to a plus (+) symbol.
- 5 To close the Component List, click the Close button in the upper-right corner. The Component List closes.



## Tool Palette

The Tool Palette provides convenient access to the Run, Edit, and Cable modes and the Compile function and can be placed anywhere on-screen.

- 1 Choose Tool Palette from the Tool menu.

The Tool Palette appears, as shown below.



- 2 Drag the Tool Palette into position as required.
- 3 Click the items to select a mode or run the Compile function.

Command	Description	See page
<b>Run</b>	Selects Run mode	66
<b>Edit</b>	Selects Edit mode	45
<b>Cable</b>	Selects Cable mode	51
<b>Compile</b>	Compiles the current configuration	61

- 4 To close the Tool Palette, click the Close button in the upper-right corner.

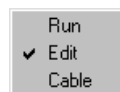
The Tool Palette closes.

## Alt Menu

The Alt menu offers a convenient method of selecting the Run, Edit, and Cable modes.

- 1 Press the Alt key.

The Alt menu appears, as shown below.



- 2 Choose a mode and then click.

Command	Description	See page
<b>Run</b>	Selects Run mode	66
<b>Edit</b>	Selects Edit mode	45
<b>Cable</b>	Selects Cable mode	51

## Keyboard Shortcuts

### File Menu

New	Ctrl+N
Open	Ctrl+O
Save	Ctrl+S
Print	Ctrl+P

### Edit Menu

Undo	Ctrl+Z
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Duplicate	Ctrl+D

---

# Building Configurations

---

# 5

## In this chapter...

How to Build & Edit Configurations .....	44
Selecting Edit Mode .....	45
Opening New Configuration Windows .....	45
Opening Saved Configurations .....	46
Selecting Open Configuration Windows .....	46
Adding Components .....	47
Editing Components .....	48
Aligning Components to the Grid .....	49
Zooming Configuration Windows .....	50
Selecting Cable Mode .....	51
Adding Wires .....	51
Deleting Wires .....	56
Working with Multiple-Unit Configurations .....	58
Resizing Sections of the Configuration Window .....	59
Saving Configurations .....	60
Saving Configurations under a New Name .....	60
Closing Configurations .....	60
Compiling Configurations .....	61
Sending Configurations to the DME32 .....	62
Receiving Configurations from the DME32 .....	63

## How to Build & Edit Configurations

The following procedure outlines how to build and edit configurations.

- 1** Select Edit mode.  
See “Selecting Edit Mode” on page 45.
- 2** Open a new or saved configuration.  
See “Opening New Configuration Windows” on page 45 or “Opening Saved Configurations” on page 46. A new configuration window is opened when DME Manager starts.
- 3** Add components as necessary.  
See “Adding Components” on page 47.  
Use the Align and Zoom functions for assistance. See “Aligning Components to the Grid” on page 49 and “Zooming Configuration Windows” on page 50.
- 4** Edit components as necessary.  
See “Editing Components” on page 48.
- 5** Wire the components together.  
See “Adding Wires” on page 51 and “Deleting Wires” on page 56.
- 6** Compile the configuration.  
See “Compiling Configurations” on page 61.
- 7** Save the configuration.  
See “Saving Configurations” on page 60.
- 8** Transfer the configuration to the DME32.  
See “Sending Configurations to the DME32” on page 62.
- 9** Take the system for a run, creating scenes as necessary.  
See “Running the System” on page 65.

## Selecting Edit Mode

Edit mode is used to build and edit configurations. It can also be used to edit scenes offline. See “Editing Scenes Offline” on page 76 for more information.

- 1 To select Edit mode, choose Edit from the Mode menu.

Alternatively, choose Edit mode from the Shortcut menu, Tool Bar, Tool Palette, or Alt menu.

“Edit” appears in the status bar.

In Edit mode, active DME32s, active meaning connected and turned on, display the message “EDIT CONTROL.”

- 2 To leave Edit mode, select another mode (e.g., Cable or Run).

The status bar indicates the newly selected mode.

## Opening New Configuration Windows

New configuration windows can be opened as follows.

- 1 Choose New from the File menu.

A new configuration window opens.

New configuration windows are automatically assigned a numbered title, starting with “Configuration1,” Configuration2,” and so on. When a configuration is saved, its title changes to the name specified.

## Opening Saved Configurations

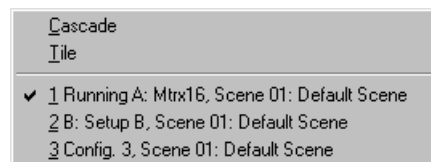
Previously saved configurations can be opened as follows. If your PC supports PC Cards, configurations stored on PC Cards can also be opened using this method.

- 1 Choose Open from the File menu.  
The standard Windows Open window appears.  
Only files with a “dme” file extension are displayed.
- 2 Select the configuration that you want to open.
- 3 Click Open to open the configuration, or click Cancel to cancel the operation.  
The configuration is opened.

## Selecting Open Configuration Windows

Open configuration windows can be selected as follows.

- 1 Choose a configuration window from the Window menu.



The chosen window becomes the current window.

On the Window menu, the title of the current configuration window has a check mark next to it. The configuration windows corresponding to the configurations in the DME32 are prefixed with the letters “A” and “B.” The currently running configuration is prefixed with the word “Running.”

You can arrange all the open configuration windows by using the Tile and Cascade commands in the Window menu.

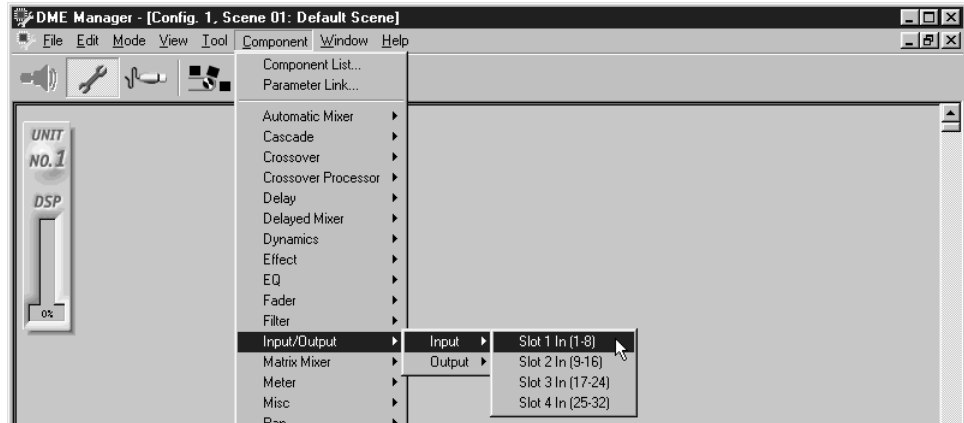
Configuration windows can be minimized, maximized, and restored to their previous size by clicking the buttons in the upper-right corner of the configuration window. Clicking the Close button closes the configuration window. Configuration windows can be resized by dragging the lower-right corner. They can also be scrolled using the horizontal and vertical scroll bars. See “Configuration Windows” on page 26 for more information.

## Adding Components

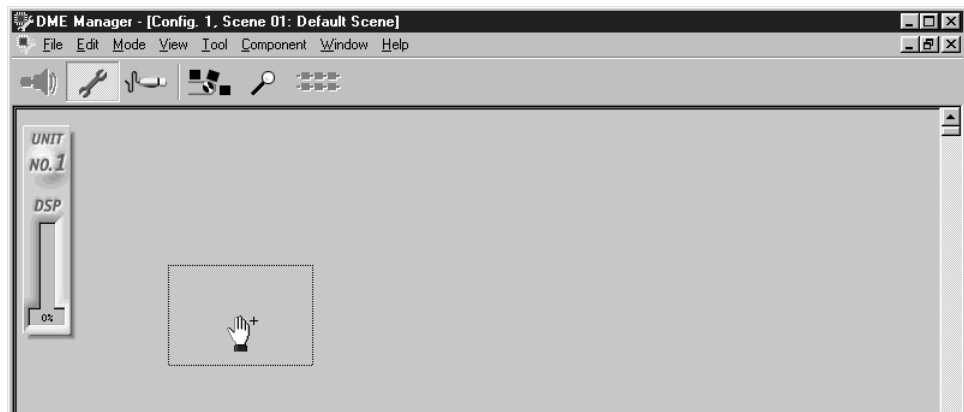
Components can be added to configurations as follows.

When building a new configuration, add the input and output components first.

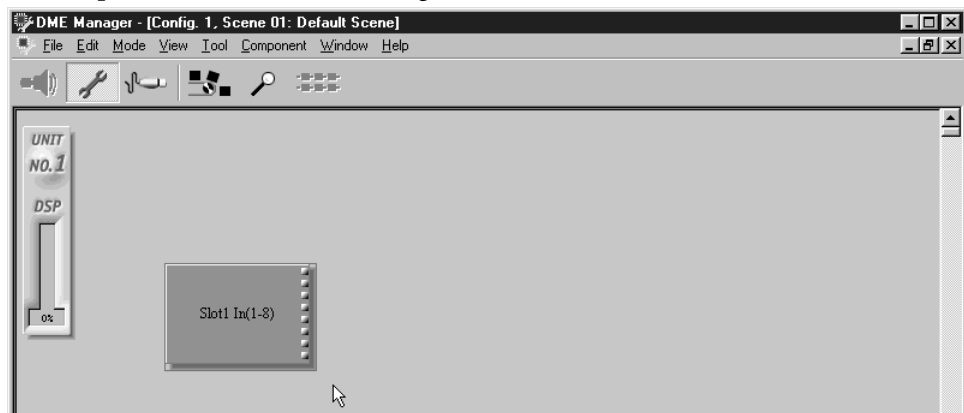
- 1 Select Edit mode.  
See “Selecting Edit Mode” on page 45.
- 2 Choose a component from the Component menu, as shown below.



The component is displayed with a dotted outline, as shown below.



- 3 Position the component in the configuration window and then click.  
The component is added to the configuration, as shown below.



- 4 Add the other components necessary to complete the configuration.  
In addition to using the Component menu, components can be added by dragging them from the Component List. See “Component List” on page 40.

The DSP power meter rises as components are added to the configuration. Note that unused components waste DSP processing power and should be deleted. Another way to conserve DSP power is to use the simplest component necessary to get the job done. Don't, for example, use a mixer component to control a signal level when a Fader component is all that's really required.

Components in a configuration can be repositioned simply by dragging. When components with wires attached are moved, the wires move as well, so there is no need for any rewiring. Components can be moved individually or in multiples. To select multiple components, hold down the Shift key and select with the mouse, or click in a blank area next to one of the components to be selected and then drag around the components to be selected.

Use the Align command to align components to the grid. See “Aligning Components to the Grid” on page 49. Use the Zoom command to see components in detail or zoom out to see more of a configuration. See “Zooming Configuration Windows” on page 50.

The last component addition can be undone by using the Undo command, which appears in both the Edit and Shortcut menus.

Up to 160 of the same component can be added to any one configuration (e.g., 160 “Fader 4” components). When a component is deleted, its number is lost for good, so if, for example, you add 160 “Fader 4” components and then delete 10, you cannot add another 10 even though there are now only 150.

## Editing Components

Listed below are the edit functions that can be used when editing components. Components can be selected for editing simply by clicking. Multiple components can be selected by holding down the Shift key and selecting with the mouse, or by clicking in a blank area next to one of the components to be selected and then dragging around the components to be selected.

The last component edit can be undone by using the Undo command, which appears in both the Edit and Shortcut menus.

- Components can be cut from the configuration and placed in the Clipboard by using the Cut command, which appears in both the Edit and Shortcut menus.
- Components can be copied to the Clipboard by using the Copy command, which appears in both the Edit and Shortcut menus.
- Components in the Clipboard can be pasted into the configuration by using the Paste command, which appears in both the Edit and Shortcut menus.
- Components can be duplicated by using the Duplicate command, which appears in both the Edit and Shortcut menus.
- Components can be deleted by using the Delete command, which appears in both the Edit and Shortcut menus.
- Component appearance, size, color, title, and so on, can be customized. See “Customizing Component Properties” on page 80.



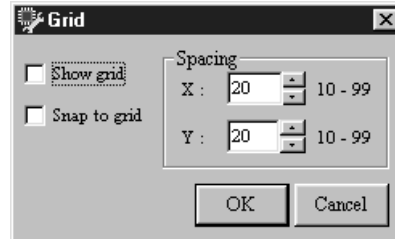
## Aligning Components to the Grid

The grid, a pattern of regularly spaced horizontal and vertical dotted lines, is convenient for aligning components. When the Snap to grid option is on, components automatically align to the grid as they are added or moved. Components already in a configuration can be aligned to the grid by using the Align command.

Note that the grid is only available when zoom is set to 100%.

- 1 Choose Grid from the View menu.

The Grid window appears, as shown below.



The Grid parameters are explained in the following table.

Section	Parameter	Range	Description
Show grid		Check/uncheck	Turns the grid on and off. When on, the grid appears in the configuration window.
Snap to grid		Check/uncheck	Turns snap to grid on and off. When on, components snap to the grid when they are added or moved.
Spacing <sup>1</sup>	X	10–99	Sets the horizontal grid spacing
	Y	10–99	Sets the vertical grid spacing

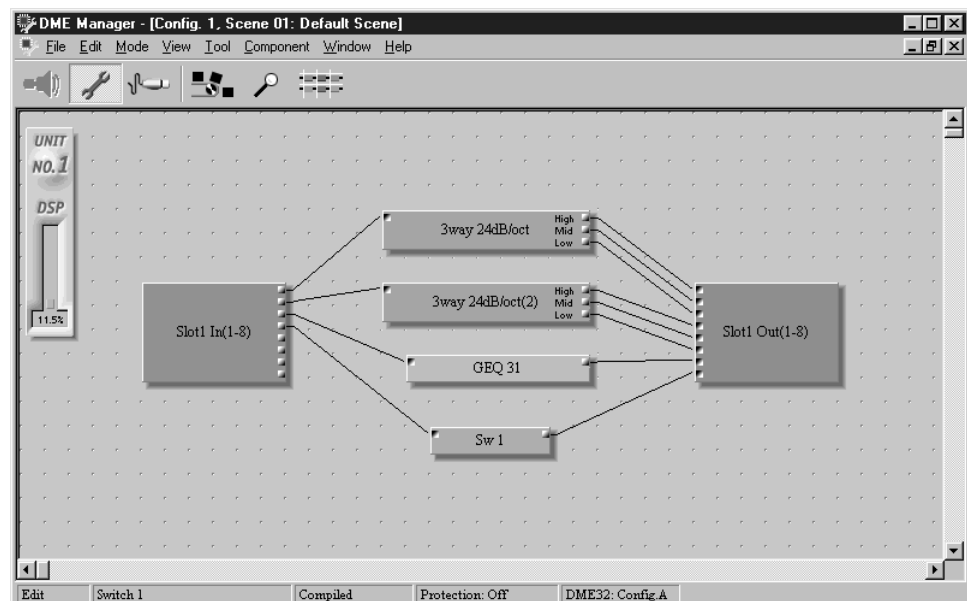
1. Can be specified using the adjacent buttons or entered from the keyboard.

- 2 Make the required settings and then click OK to save your settings, or click Cancel to leave them unchanged.

The Grid window closes.

When the grid is on, unaligned components can be aligned by using the Align command, which appears in the Edit and Shortcut menus and on the Tool Bar.

The following configuration window shows a typical grid with an even X/Y spacing.



## Zooming Configuration Windows

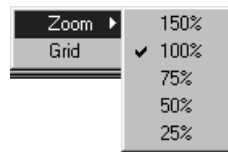
You can zoom in to see components in detail or zoom out to see more of a configuration by using the Zoom command, which offers magnification levels of 150%, 100% (default), 75%, 50%, and 25%.

- 1 Choose a Zoom value from the View menu.

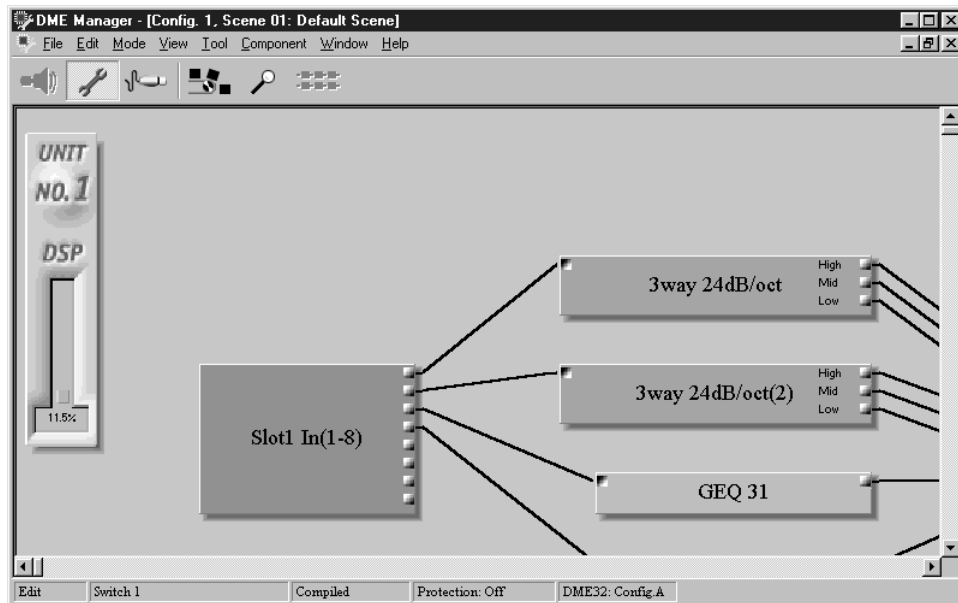
All open configurations are zoomed.

Configurations can also be zoomed by clicking the Zoom button on the Tool Bar. Clicking this button repeatedly cycles through the magnification levels.

In the Zoom menu, the currently selected zoom setting has a check mark next to it, as shown below.



The following configuration window shows a configuration zoomed to 150%.



## Selecting Cable Mode

Cable mode is used to wire components together.

- 1 To select Cable mode, choose Cable from the Mode menu.

Alternatively, choose Cable mode from the Shortcut menu, Tool bar, Tool Palette, or Alt menu.

“Cable” appears in the status bar and the cursor changes to the cable tool, as shown below.



In Cable mode, active DME32s, active meaning connected and turned on, display the message “EDIT CONTROL.”

- 2 To leave Cable mode, select another mode (e.g., Edit or Run).

The status bar indicates the newly selected mode.

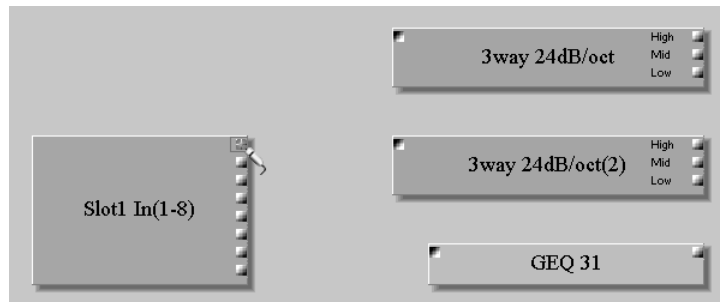
## Adding Wires

Wires can be added individually or in multiples.

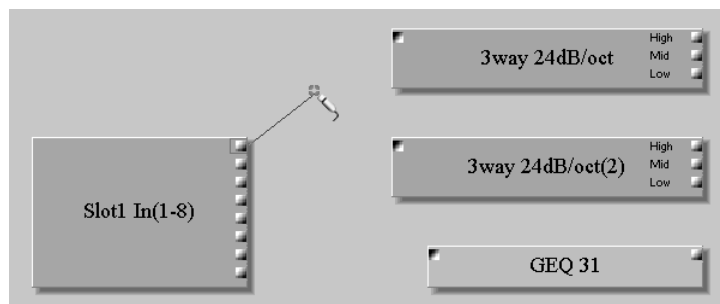
### Adding Individual Wires

- 1 Select Cable mode.  
See “Selecting Cable Mode” on page 51.
- 2 Position the cable tool over the first node.

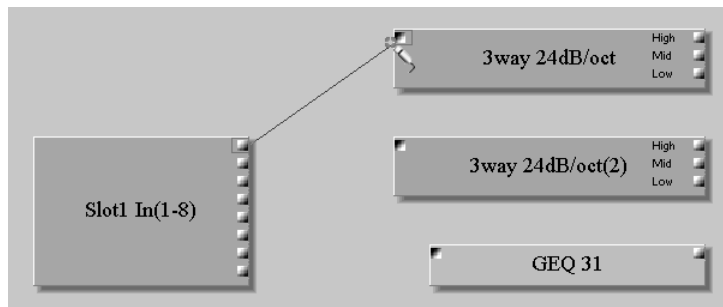
A small box appears around the node, as shown below.



- 3 Drag the wire to the second node, as shown below.

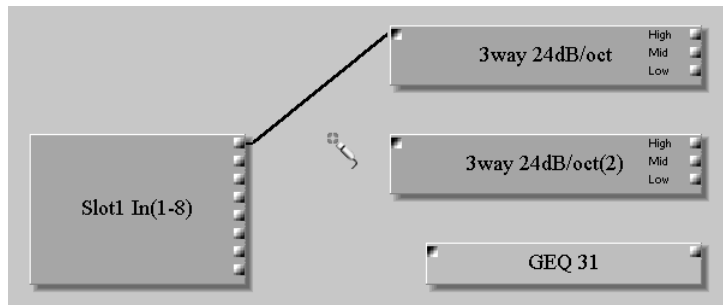


A small box appears around the second node, as shown below.



4 Drop the wire onto the node.

The wire appears between the two nodes, as shown below.



The last wire addition can be undone by using the Undo command, which appears in both the Edit and Shortcut menus.

## Adding Multiple Wires

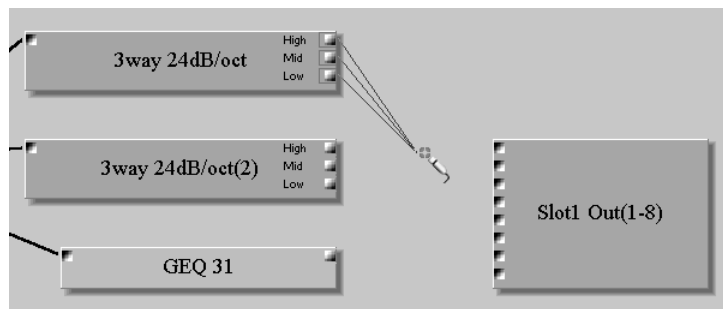
Multiple wires can be added in two different ways. To wire all nodes of a component, you simply click near the nodes and all nodes are selected automatically. To wire a selection of adjacent nodes, you select them by dragging around the nodes.

### Wiring all Nodes of a Component

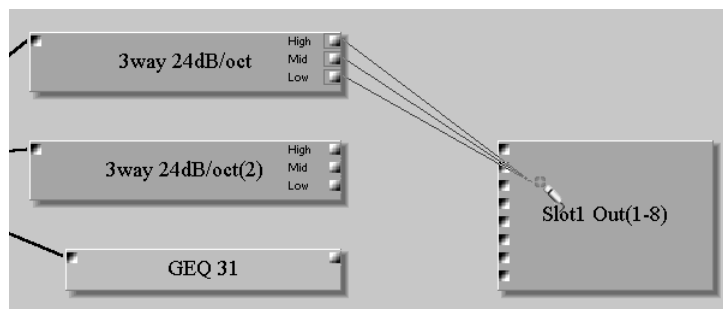
- 1 Position the cable tool behind the nodes on the component, as shown below.



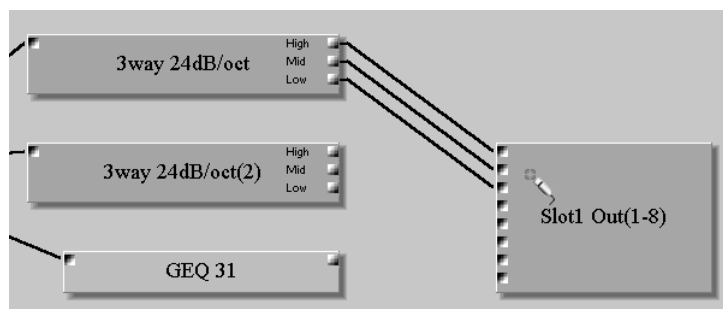
- 2 Click and drag, as shown below.



- 3 Drop the wires behind the nodes on the other component, as shown below.

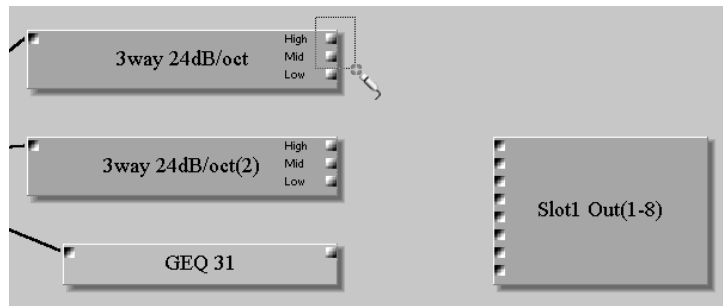


The wires appear between the nodes, as shown below.

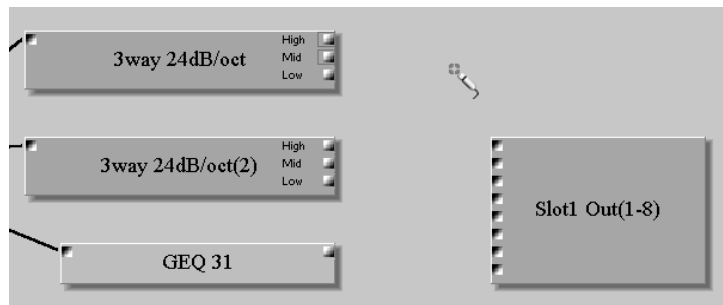


### Wiring Selected Adjacent Nodes of a Component

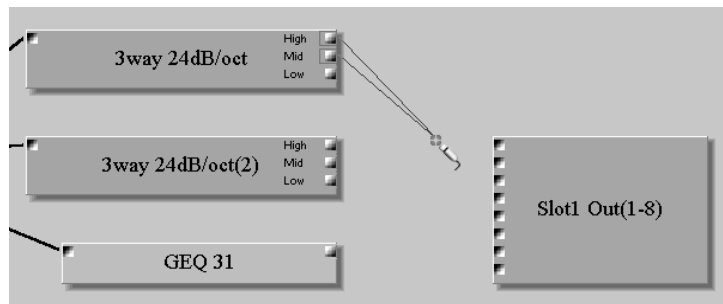
- 1 Click in a blank area next to one of the nodes to be wired and then drag around the nodes to be wired, as shown below.



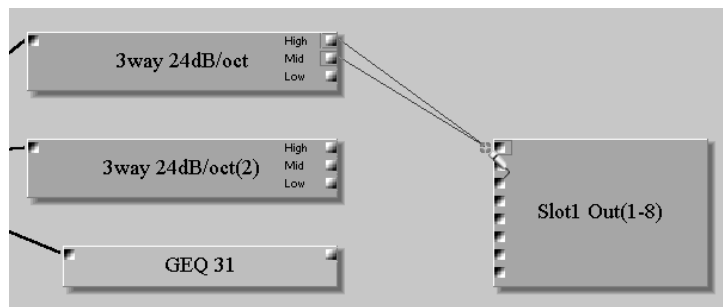
- 2 Release the mouse button. Small boxes appear around the selected nodes, as shown below.



- 3 Drag any one of the selected nodes to the top node of the other component, as shown below.

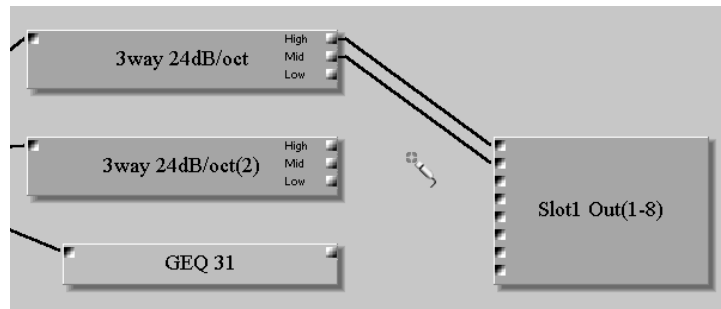


A small box appears around the top node, as shown below.



- 4 Drop the wires onto the top node.

The wires appear between the nodes, as shown below.

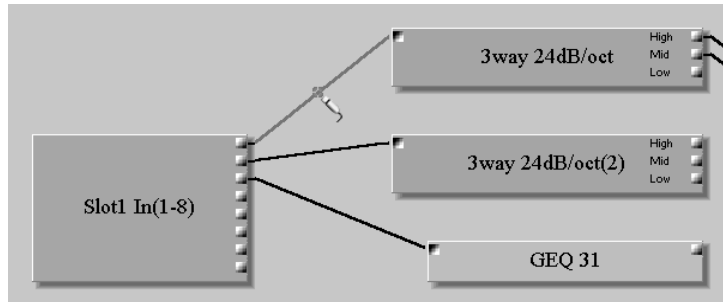


## Deleting Wires

Wires can be deleted individually or in multiples.

### Deleting Individual Wires

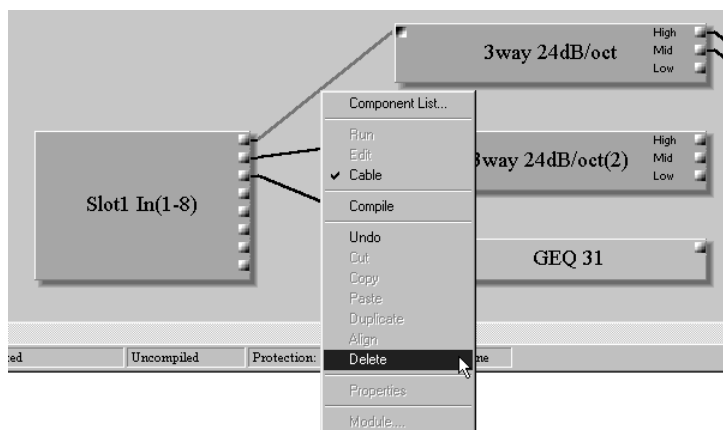
- 1 Position the cable tool over the wire to be deleted, as shown below.



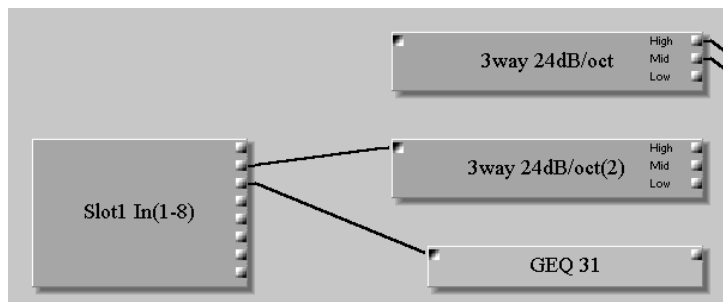
The wire appears highlighted.

- 2 Choose the Delete command from the Edit or Shortcut menu.

The Shortcut menu is shown below.



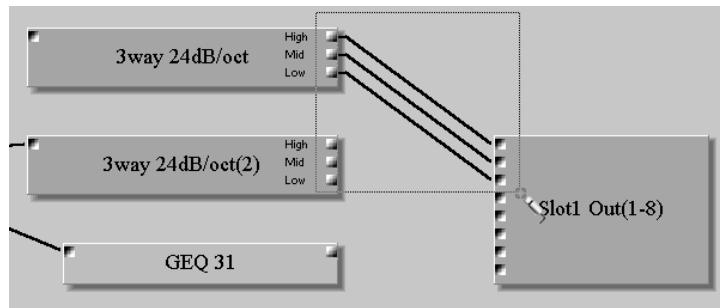
The wire is deleted, as shown below.





## Deleting Multiple Wires

- 1 Click in a blank area next to one of the nodes whose wire is to be deleted and then drag around the other nodes, as shown below.

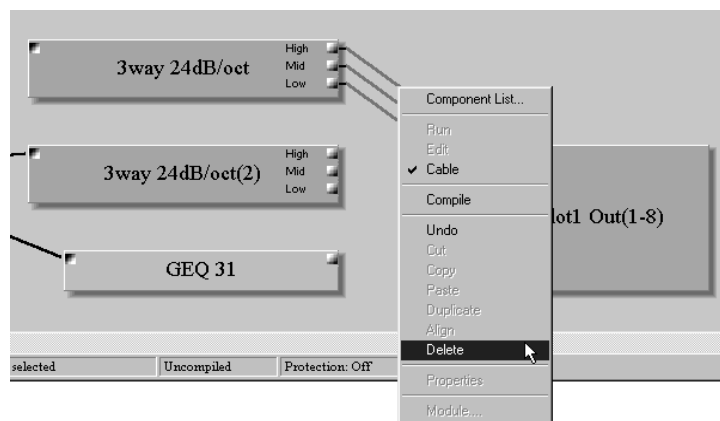


The wires appears highlighted.

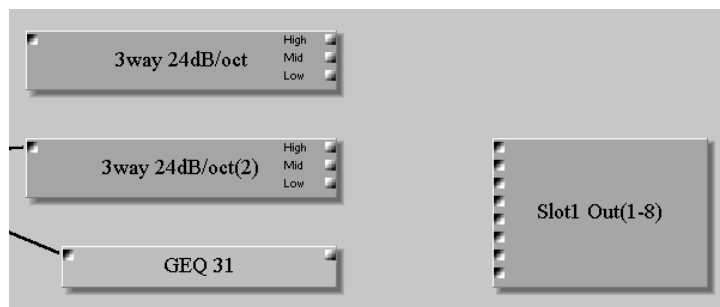
Multiple wires can also be selected by holding down the Shift key and selecting with the mouse.

- 2 Choose the Delete command from the Edit or Shortcut menu.

The Shortcut menu is shown below.



The wires are deleted, as shown below.

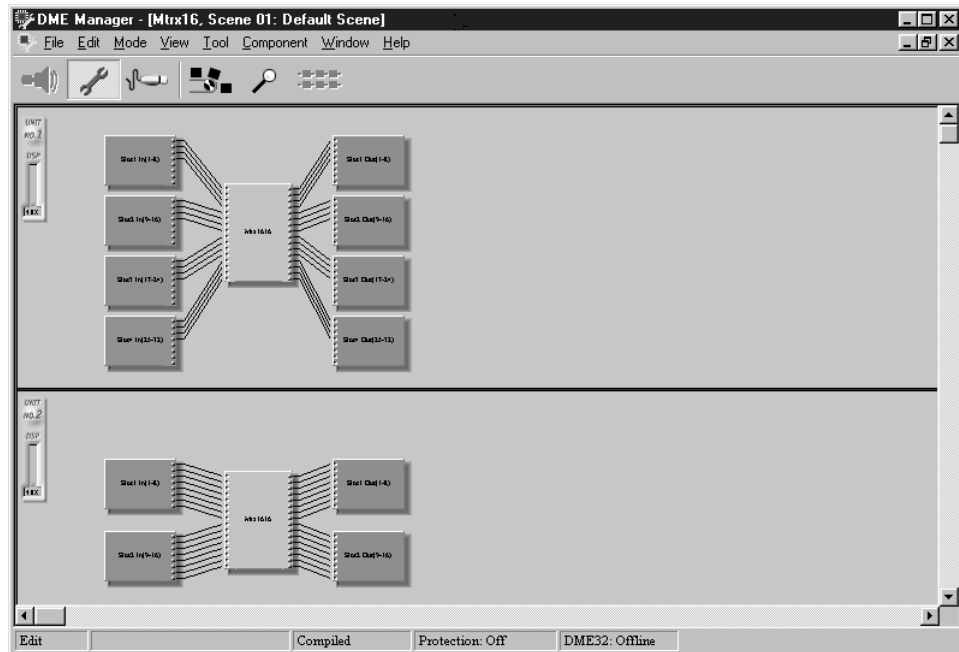


## Working with Multiple-Unit Configurations

When building and editing multiple-unit systems, use the scroll bars to access each section of the configuration window. Sections can be resized as required. See “Resizing Sections of the Configuration Window” on page 59 for more information.

Components for each DME32 are placed in the corresponding section of the configuration window. Components cannot be placed on boundary lines nor can they be dragged between sections. When a component is moved from one section to another, the corresponding DSP power meters adjust accordingly.

The following example shows a configuration window with two DME32s.



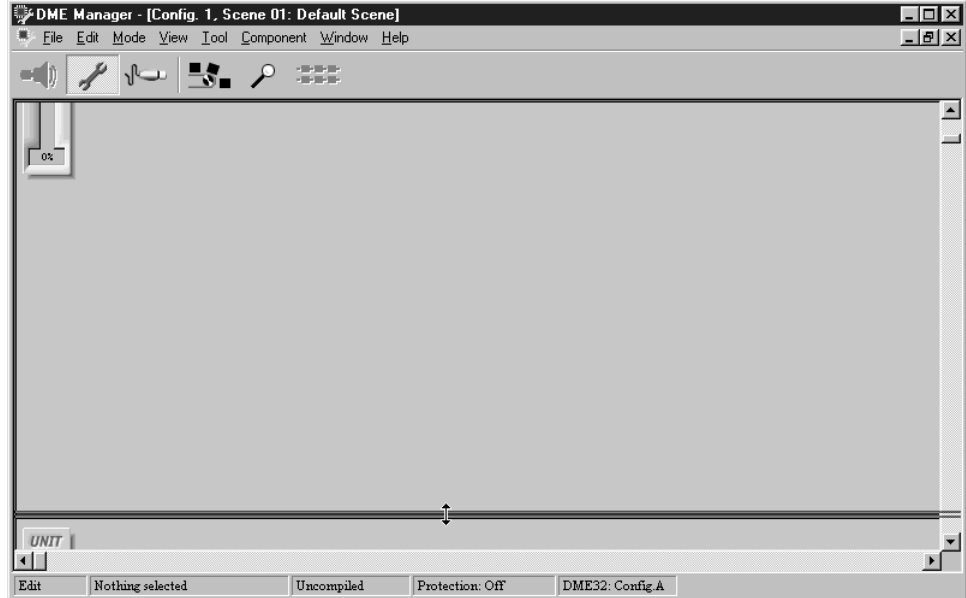
Signals can be distributed among DME32s by using the Cascade components. See “Cascade” on page 92 for more information.

## Resizing Sections of the Configuration Window

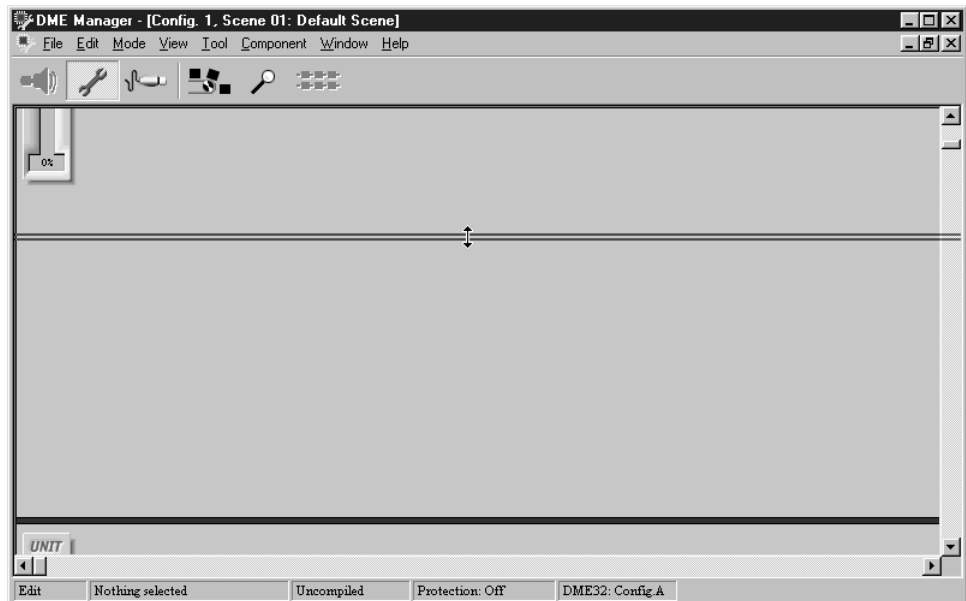
The individual sections of the configuration window can be resized as follows.

- 1 Position the cursor over a boundary line.

The cursor changes to the resize arrows, as shown below.



- 2 Drag the boundary to its new position, as shown below.



## Saving Configurations

The current configuration can be saved to any storage media that can be accessed by the Windows operating system. If your PC supports PC Cards, configurations can be saved to a PC Card and then loaded into the DME32 via its card slot.

Note that configurations must be compiled before they can be saved. See “Compiling Configurations” on page 61 for more information.

- 1 Choose Save from the File menu.

If the configuration has previously been saved, it's saved and the previous version is overwritten.

If the configuration has not yet been saved, the standard Windows Save As window appears, in which case you need to enter a filename, select a folder, and then click Save.

Configurations are saved with a “dme” file extension, and can be managed (e.g., copied, deleted, backed up, etc.) just like any Windows file.

## Saving Configurations under a New Name

The current configuration can be saved under a new name as follows.

Note that configurations must be compiled before they can be saved. See “Compiling Configurations” on page 61 for more information.

- 1 Choose Save As from the File menu.

The standard Windows Save As window appears.

- 2 Enter the name under which you want to save the configuration.
- 3 Select the folder where you want to save the configuration.
- 4 Click Save to save the configuration, or click Cancel to cancel the operation.


## Closing Configurations

The current configuration can be closed as follows.

- 1 Choose Close from the File menu.

If the configuration window contains no unsaved changes, the window closes.

If the configuration window contains unsaved changes, a message asking if you would like to save the changes appears. Click OK to save the changes and close the configuration window, or click Cancel to cancel the operation.

-  Configurations can also be closed by clicking the Close button in the upper-right corner of the configuration window.

## Compiling Configurations

Configurations must be compiled before they can be saved or transferred to the DME32. Compiling translates the configuration into information that the DME32 can understand.

Configurations can be compiled in either Edit or Cable mode.

The current configuration can be compiled as follows.

- 1 Click the **Compile** button on the Tool Bar.

Alternatively, choose **Compile** from the File menu, click the **Compile** button on the Tool Palette, or choose **Compile** from the Shortcut menu.

The **Compile** progress indicator window appears, as shown below.



If the compilation is successful, the message “**Compile Complete**” appears and the compilation status in the status bar changes from “**Uncompiled**” to “**Compiled**.”

- 2 Click **OK** to close the **Compile** progress indicator window.

The configuration can now be transferred to the DME32.

If the compilation fails, a message stating the reason appears and the compilation status in the status bar changes to “**Compile Failure**.” In this case you should rectify the problem and try compiling again.

Compiling a configuration requires a small amount of DSP processing power. In some cases, compiling may fail even though the DSP power meter does not indicate 100%. This is because the DSP power meter displays approximate usage, and its accuracy is affected by the type of components in the configuration and the order in which they were added and wired.

Configurations must be compiled and transferred to the DME32 each time any changes are made to the configuration, or when any of the following settings are changed: **User Define**, **GPI**, **Wordclock**, or **Parameter Link**.

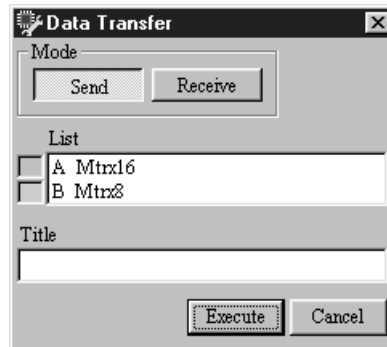
## Sending Configurations to the DME32

This section explains how to send the current configuration to the DME32. Configurations must be compiled before they can be sent. See “Compiling Configurations” on page 61. When a configuration is sent to the DME32, all its scenes are sent as well.

*Note: When a configuration is sent to the DME32, sound may be output suddenly, depending on the system, so turn down the D/A converters or power amps beforehand.*

- 1 Choose Data Transfer from the File menu.

The Data Transfer window appears, as shown below.



- 2 In the Mode section, click Send.
- 3 From the List, select the DME32 configuration memory to which you want to send the configuration.

The List shows the titles of the configurations already stored in the DME32. The title of the current configuration has a green indicator next to it. If no data is stored in a memory, the title “NO DATA” is displayed.

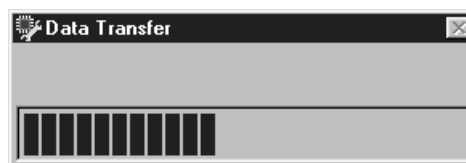
- 4 In the Title field, enter a title for the configuration.

Titles can be up to 24 characters long, although only the first seven characters appear on the DME32 display.

- 5 Click Execute.

If you selected a DME32 configuration memory that already contains data, an overwrite confirmation message appears. Click OK to overwrite and proceed with the transfer, or click Cancel to cancel the operation.

The current configuration is sent to the DME32 and the configuration transfer progress indicator appears, as shown below.



When the transfer is complete, the transfer progress indicator closes.

If the message “Memory Full” appears, the configuration cannot be transferred.

- 6 Click Cancel to close the Data Transfer window.

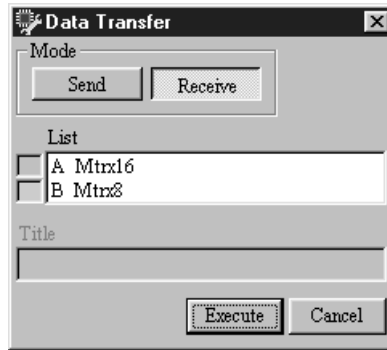
The Data Transfer window closes.

## Receiving Configurations from the DME32

This section explains how to receive configurations from the DME32. The two configurations can be received individually or together. When a configuration is received from the DME32, all its scenes are received as well.

- 1 Choose Data Transfer from the File menu.

The Data Transfer window appears, as shown below.



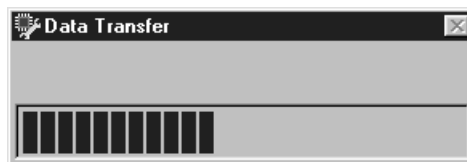
- 2 In the Mode section, click Receive.
- 3 From the List, select the DME32 configuration you want to receive.

The List shows the titles of the configurations stored in the DME32. The title of the current configuration has a green indicator next to it. If no data is stored in a memory, the title “NO DATA” is displayed.

Both configurations can be selected by holding down the Shift key and selecting with the mouse.

- 4 Click Execute.

The selected configuration is received and the configuration transfer progress indicator appears, as shown below.



When the transfer is complete, the transfer progress indicator closes.

The received configuration appears in a new configuration window and the number and title of the configuration and the current scene appear in the title bar.

- 5 Click Cancel to close the Data Transfer window.

The Data Transfer window closes.

# Running the System

---

# 6



## In this chapter...

Selecting Run Mode .....	66
Run Mode Controller .....	67
Editing Component Parameters .....	69
Storing Scenes .....	70
Recalling Scenes .....	72
Recalling Configurations .....	74



## Selecting Run Mode

Run mode is used to control the DME32 system in real time, which includes editing component parameters, storing and recalling scenes, and recalling configurations. In Run mode, actions performed on DME Manager are reflected on the DME32 and vice versa. Components and wires cannot be edited in this mode.

Run mode can only be selected when the current configuration window corresponds to the current DME32 configuration. In order to achieve this you must transfer a configuration to the DME32, or receive a configuration from the DME32. All configuration data can be received from the DME32 when DME Manager is started. See “Starting DME Manager” on page 12 for more information. It can also be received manually. See “Receiving Configurations from the DME32” on page 63 for more information.

When Run mode is selected with several configuration windows open, the configuration and scene of the currently selected configuration window are selected on the DME32. Once Run mode has been selected, other windows can be selected, but they cannot be controlled. To control another DME32 configuration, recall it from the DME32 front panel or the Run Mode Controller window, or temporarily switch to Edit mode, select the other configuration window, and then switch back to Run mode.

- 1 To select Run mode, choose Run from the Mode menu.

Alternatively, choose Run mode from the Shortcut menu, Tool Bar, Tool Palette, or Alt menu.

“Run” appears in the status bar and the Run Mode Controller appears, as shown below. DME32 configurations can be recalled and scenes can be stored and recalled from this window just like they can from the DME32 front panel.



The DME32 switches to Run mode and displays the configuration title, scene title, and the value of the selected component parameter. This is the first parameter of the first component, unless the [USER DEFINE] button has been assigned, in which case, the parameter assigned to that button is selected and the USER DEFINE indicator lights up. This is the same as what happens when the DME32 is turned on without DME Manager connected.

- 2 To leave Run mode, select another mode (e.g., Edit or Cable).

The Run Mode Controller disappears.

The status bar indicates the newly selected mode.

The DME32 displays the message “EDIT CONTROL.”

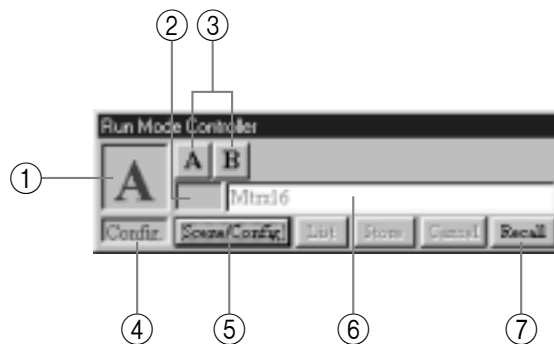
## Run Mode Controller

The Run Mode Controller, which appears automatically when Run mode is selected, is used to recall DME32 configurations and to store and recall scenes just like using the DME32 front panel. It appears only when Run mode is selected and cannot be accessed from the menus or elsewhere.

The layout of the Run Mode Controller depends on whether it's being used to control configurations or scenes, and this is set by clicking the Scene/Config button.

### Configuration Control

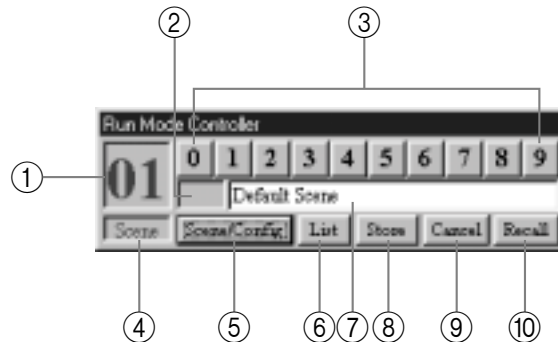
When configuration control is selected, the Run Mode Controller appears as shown below.



- ① **Configuration number**  
This displays the number of the current configuration. When the other configuration is selected, its number flashes until that configuration is recalled.
- ② **Edit indicator**  
This indicator is unavailable with configuration control.
- ③ **Selector buttons**  
These buttons are used to select the configurations.
- ④ **Scene/Config indicator**  
This indicates whether configuration control or scene control is selected.
- ⑤ **Scene/Config button**  
This button toggles between configuration control and scene control.
- ⑥ **Configuration title**  
This section displays the title of the current configuration. When the other configuration is selected, its title appears.
- ⑦ **Recall button**  
This button is used to recall the selected configuration. If the selected configuration memory contains no data, this button is unavailable.

## Scene Control

When scene control is selected, the Run Mode Controller appears as shown below.



- ① **Scene number**  
This displays the number of the current scene. When another scene is selected, its number flashes until that scene is recalled, stored, or cancelled.
- ② **Edit indicator**  
This indicates whether or not the current scene (i.e., the current component parameter settings) matches the last recalled scene. When a scene is recalled, this indicator is empty. If a parameter is edited, the word “EDIT” appears, indicating that a parameter has been edited since the last scene was recalled. When a scene is stored, “EDIT” disappears. This operates in exactly the same way as the scene edit dots on the DME32 display. See “Front Panel” on page 16 for more information.
- ③ **Selector buttons**  
These buttons are used to select scenes and operate in exactly the same way as the number keypad on the DME32 front panel.
- ④ **Scene/Config indicator**  
This indicates whether configuration control or scene control is selected.
- ⑤ **Scene/Config button**  
This button toggles between configuration control and scene control.
- ⑥ **List button**  
This button opens the Scene List.
- ⑦ **Scene title**  
This section displays the title of the current scene. Scenes can be titled by entering a title here before clicking the Store button.
- ⑧ **Store button**  
This button is used to store the current scene (i.e., the current component parameter settings) to the selected scene memory.
- ⑨ **Cancel button**  
This button is used to cancel the selection made using the selector buttons.
- ⑩ **Recall button**  
This button is used to recall the selected scene. If the selected scene memory contains no data, this button is unavailable.

## Editing Component Parameters

In Run mode, component parameters can be edited from the DME32 front panel (see page 201) or from DME Manager. Either way, edits are reflected on both the DME32 and DME Manager. This section explains how to edit component parameters from DME Manager.

**1** Select Run mode.

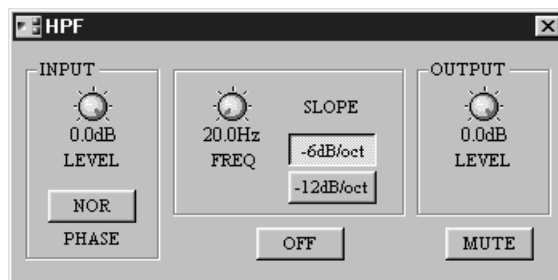
See “Selecting Run Mode” on page 66 for more information.

The Run Mode Controller appears.

**2** Double-click the component whose parameters you want to edit.

The component’s control window opens.

An example of a control window is shown below.



**3** Edit the parameters as required.

For detailed information on using control window controls, including rotary controls, sliders, and buttons, see “Component Control Windows” on page 31.

Parameter edits made on control windows are reflected on the DME32.

The DME32 display shows one parameter at a time. If the currently selected parameter on the DME32 is the same as the one you are editing on DME Manager, you’ll see its value change on the display. Likewise, if you edit a parameter value from the DME32 front panel, you’ll see its value change on the corresponding control window.

For information on selecting and editing parameters from the DME32 front panel, see “Editing Parameters & the User Define Button” on page 201.

When a parameter is edited, the word “EDIT” appears in the edit indicator on the Run Mode Controller and the scene edit dots appear on the DME32 display. See “Scene Control” on page 68 for more information.

**4** When you’ve finished editing, close the control window.

To store your edits to a scene memory, see “Storing Scenes” on page 70.

## Storing Scenes

In Run mode, scenes can be stored from the DME32 front panel (see page 199) or from DME Manager. Either way, the store is reflected on both the DME32 and DME Manager. This section explains how to store DME32 scenes from DME Manager.

*Note: When storing a scene, make sure that there are no settings that you do not want to store. Perhaps some settings have been adjusted accidentally, or by someone else. If you're not sure, recall the last scene, make the adjustments that you really want, and then store the scene. You may want to store the current scene to an unused memory just in case you need to return to it later.*

Scenes can be stored by using the Run Mode Controller or the Scene List, the latter allowing you to select scenes from a list. Although the end result is the same, each method is explained separately.

All new configurations are created with a Default Scene in scene memory 01. Initially, this scene contains the component parameter's initial values, but it can be edited, titled, stored, and recalled just like the other scenes, although it cannot be deleted.

In a multiple-unit system, the selected scene is stored on all DME32s via the cascade connections.

### Storing Scenes from the Controller

- 1 Select Run mode.

See “Selecting Run Mode” on page 66 for more information.

The Run Mode Controller appears. See “Run Mode Controller” on page 67 for more information.

- 2 Click the Scene/Config button to select scene control, as shown below.



- 3 Use the selector buttons to select a scene memory.

On the Run Mode Controller, the number of the selected scene flashes and its title appears. If the scene memory contains no data, the title “NO DATA!” appears.

- 4 Enter a title for the scene in the title field.

Scene titles can be up to 24 characters long, although only the first 16 characters appear on the DME32 display.

- 5 To cancel your selection, click Cancel.

On the Run Mode Controller, the number and title of the current scene (i.e., the last scene recalled) appear.

- 6 To store the selected scene, click Store.

The selected scene is stored on the DME32 and its number and title appear on the display. On the Run Mode Controller, the number of the stored scene stops flashing. The stored scene becomes the current scene and its number and title appear in the configuration window's title bar.

In some cases, scenes cannot be stored due to insufficient memory in the DME32.

## Storing Scenes from the List

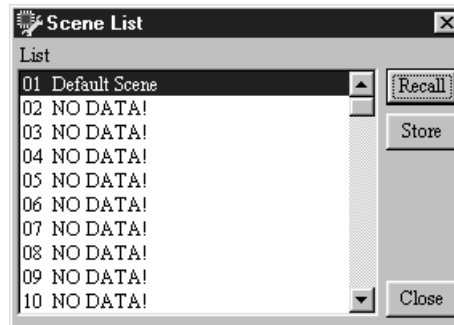
- 1 Select Run mode.

See “Selecting Run Mode” on page 66 for more information.

The Run Mode Controller appears.

- 2 Click List.

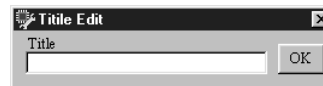
The Scene List appears, as shown below.



- 3 Select a scene memory from the list.

- 4 Click Store.

The Title Edit window appears, as shown below.



- 5 Enter a title for the scene.

Scene titles can be up to 24 characters long, although only the first 16 characters appear on the DME32 display.

- 6 Click OK.

The Title Edit window closes and the selected scene is stored on the DME32. The number and title of the scene appears on the DME32 display, the Run Mode Controller, and the Scene List. The stored scene becomes the current scene and its number and title appear in the configuration window's title bar.

## Recalling Scenes

In Run mode, scenes can be recalled from the DME32 front panel (see page 200) or from DME Manager. Either way, the recall is reflected on both the DME32 and DME Manager. This section explains how to recall DME32 scenes from DME Manager.

*Note: When recalling a scene, be aware that volume levels may change abruptly as parameters change—nobody likes sudden loud noises, or worse, speaker damage.*

Scenes can be recalled by using the Run Mode Controller or the Scene List, the latter allowing you to select scenes from a list. Although the end result is the same, each method is explained separately.

In a multiple-unit system, the selected scene is recalled on all DME32s via the cascade connections.

### Recalling Scenes from the Controller

- 1 Select Run mode.

See “Selecting Run Mode” on page 66 for more information.

The Run Mode Controller appears. See “Run Mode Controller” on page 67 for more information.

- 2 Click the Scene/Config button to select scene control, as shown below.



- 3 Use the selector buttons to select a scene memory.

On the Run Mode Controller, the number of the selected scene flashes and its title appears. Only scene memories that contain data can be recalled. When an empty scene memory is selected, the RECALL/ENTER button is unavailable.

- 4 To cancel your selection, click Cancel.

On the Run Mode Controller, the number and title of the current scene (i.e., the last scene recalled) appear.

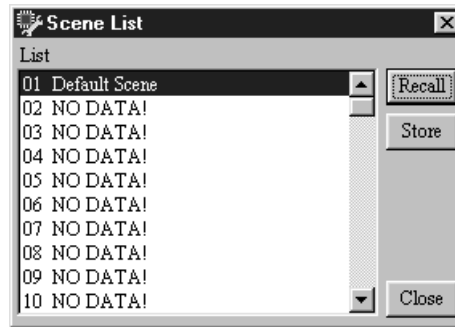
- 5 To recall the selected scene, click Recall.

The selected scene is recalled on the DME32 and the component parameters are set accordingly. The scene number and title appear on the DME32 display. On the Run Mode Controller, the number of the recalled scene stops flashing.

The recalled scene becomes the current scene and its number and title appear in the configuration window's title bar. If DME Manager does not already have the scene data, it retrieves it automatically from the DME32.

## Recalling Scenes from the List

- 1 Select Run mode.  
See “Selecting Run Mode” on page 66 for more information.  
The Run Mode Controller appears.
- 2 Click List.  
The Scene List appears.
- 3 Click the Scene tab if the Scene page is not already shown, as shown below.



- 4 Select a scene memory from the list.
- 5 Click Recall.

The selected scene is recalled on the DME32 and the component parameters are set accordingly. The number and title of the scene appears on the DME32 display and the Run Mode Controller.

The recalled scene becomes the current scene and its number and title appear in the configuration window's title bar. If DME Manager does not already have the scene data, it retrieves it automatically from the DME32.



## Recalling Configurations

In Run mode, configurations can be recalled from the DME32 front panel (see page 198) or from DME Manager. Either way, the recall is reflected on both the DME32 and DME Manager. This section explains how to recall DME32 configurations from DME Manager.

*Note: When recalling a configuration, be aware that volume levels may change abruptly as the system is reconfigured—nobody likes sudden loud noises, or worse, speaker damage.*

In a multiple-unit system, the selected configuration is recalled on all DME32s via the cascade connections.

**1** Select Run mode.

See “Selecting Run Mode” on page 66 for more information.

The Run Mode Controller appears. See “Run Mode Controller” on page 67 for more information.

**2** Click the Scene/Config button to select configuration control, as shown below.



**3** Use the selector buttons to select a configuration memory.

On the Run Mode Controller, the number of the selected configuration flashes and its title appears. Only configuration memories that contain data can be recalled. When an empty configuration memory is selected, the Recall button is unavailable.

**4** To recall the selected configuration, click Recall.

The selected configuration is recalled on the DME32, the last recalled scene of that configuration is recalled, and the component parameters are set accordingly. The configuration and scene titles appear on the DME32 display. On the Run Mode Controller, the number of the recalled configuration stops flashing.

If open, the corresponding configuration window becomes the current window and the number and title of the recalled configuration appear the title bar. If the corresponding configuration window is not open, the message “Receive data from DME32?” appears. Click OK to receive the configuration data from the DME32.

# Other DME Designer Functions

---



## In this chapter...

Editing Scenes Offline .....	76
Linking Component Parameters .....	78
Customizing Component Properties .....	80
Changing the Size of Rotary Controls & Sliders .....	82
Using Password Protection .....	83
Assigning the User Define Button .....	86
Printing .....	87

## Editing Scenes Offline

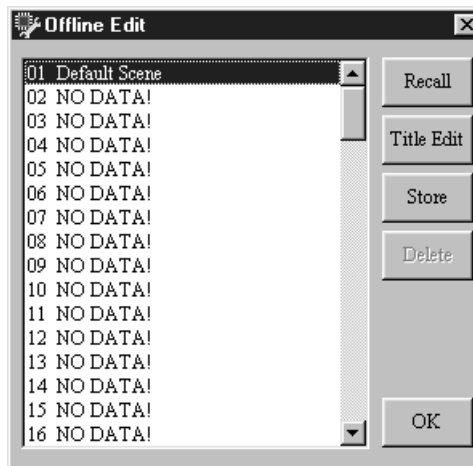
Scenes can be edited and previewed offline, with no DME32s connected.

New configurations are created with a Default Scene in scene memory 01. Initially, this scene contains the component parameters' initial values, but it can be edited, titled, stored, and recalled just like any other scene, although it cannot be deleted.

- 1 Choose Offline Edit from the File menu.

Note that the Offline Edit command is not available in Run mode.

The Offline Edit window appears, as shown below.



The Offline Edit window lists all the scenes in the current configuration.

- 2 Select the scene that you want to edit from the list.
- 3 Click Recall.

The selected scene is recalled and the component parameters are set accordingly. The recalled scene becomes the current scene and its number and title appear in the configuration window's title bar.

The scene is not recalled on any connected DME32s.

- 4 Edit the component parameters as required.
- 5 Click Store to store your edits to the current scene memory.

To store your edits to another scene memory, select that memory from the list, and then click Store.

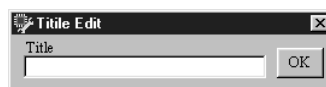
The scene is stored.

The scene is not stored on any connected DME32s.

- 6 To edit a scene's title, select it from the list and then click Title Edit.

Alternatively, double-click the scene in the list.

The Title Edit window appears, as shown below.



Only scenes that contain data can be titled.

- 7** Enter a title and then click OK.

Scene titles can be up to 24 characters long, although only the first 16 characters appear on the DME32 display.

The Title Edit window closes and the edited title appears in the scene list.

- 8** To delete a scene, select it from the list and then click Delete.

The scene is deleted and the scene memory title reverts to “NO DATA!”

Only scenes that contain data can be deleted.

- 9** When you’ve finished editing, click OK.

The Offline Edit window closes.

- 10** To save your scene edits, save the configuration as normal.

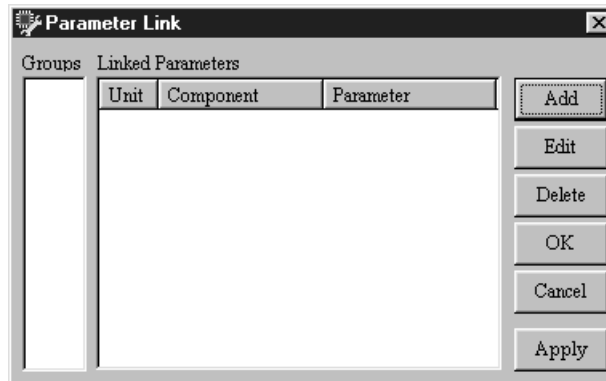
You must transfer the configuration to the DME32 for the scene edits to take effect. See “How to Build & Edit Configurations” on page 44 for more information.

## Linking Component Parameters

Component parameters can be linked into groups. When a parameter in a group is adjusted, the other parameters in that group are also adjusted. Parameter linking allows simultaneous control of independent signals and can be used, for example, to control fader groups, stereo signals, or crossover frequencies in multiple speaker systems. In multiple-unit systems, component parameters can be linked across DME32s. Different parameter link settings can be stored in each scene.

- 1 Choose Parameter Link from the Component menu.

The Parameter Link window appears, as shown below.



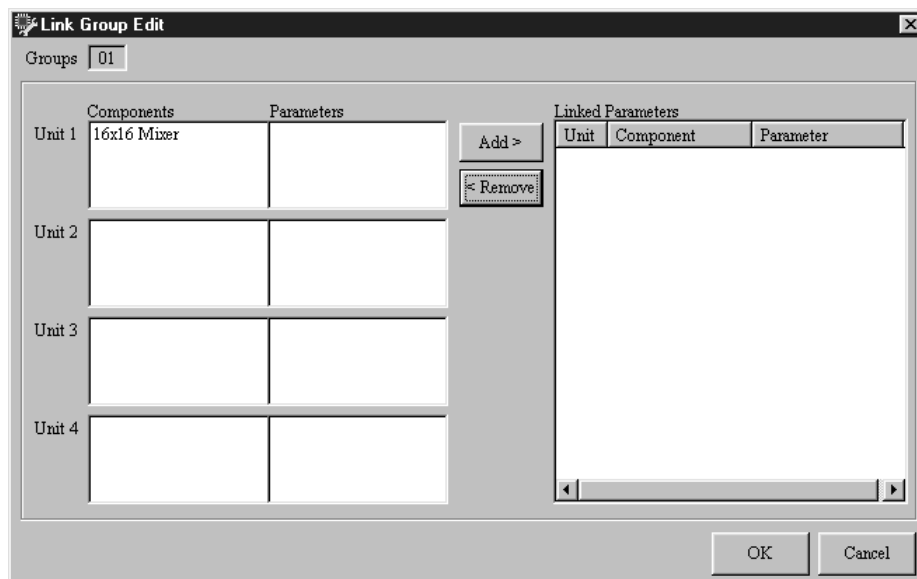
The Groups section lists all the existing groups, while the Linked Parameters section lists all the parameters in the selected group, including the unit and component they belong to.

- 2 To create a new group, click Add.

Up to 32 groups can be created.

To edit an existing group, select the group from the Groups list, and then click Edit. To delete an existing group, select the group from the Groups list, and then click Delete.

The Link Group Edit window appears, as shown below.



The number of the selected group appears in the upper-left corner of the window. The Components section lists all the components in each section of the configuration window (i.e., the components for each DME32) and the Parameters section lists all the parameters available for that component.

- 3 Select a component from the Components list.  
The parameters for that component appear in the Parameters section.  
Router component buttons cannot be linked.
- 4 Select a parameter.
- 5 Click Add to add the selected parameter to the group.  
The parameter appears in the Linked Parameters section.  
Up to 16 parameters can be added to each group.
- 6 To remove a parameter, select it from the Linked parameters list, and then click Remove.
- 7 Make the required settings and then click OK to save your settings, or click Cancel to leave them unchanged.  
The Link Group Edit window closes (the Parameter Link window is still open).
- 8 When you've finished editing the groups, click Apply to save your settings and leave the Parameter Link window open, click OK to save your settings and close the window, or click Cancel to leave the settings unchanged and close the window.  
The Parameter Link window closes.  
Using the Apply button instead of the OK button is convenient when working offline, as it allows you to edit and view parameter link settings for each scene without having to keep opening and closing the Parameter Link window.  
You must compile and transfer the configuration to the DME32 for the parameter links to take effect. See "How to Build & Edit Configurations" on page 44 for more information.

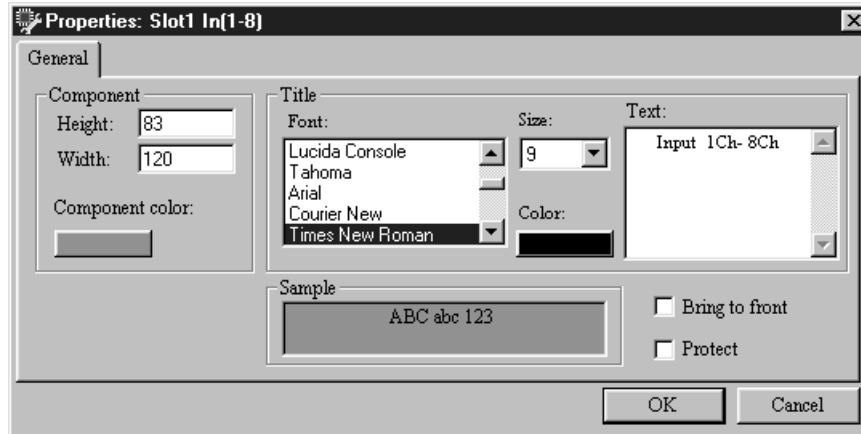
## Customizing Component Properties

You can customize the appearance of components by using the Properties window.

- 1 Select the component whose properties you want to customize.
- 2 Choose Properties from the Edit menu.

Properties can also be chosen from the Shortcut menu.

The Properties window appears, as shown below.



The title of the component selected appears in the Properties window's title bar.

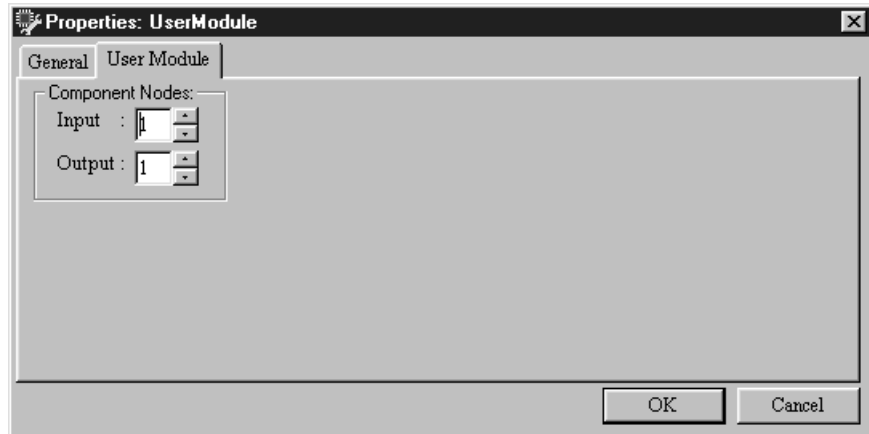
The Properties parameters are explained in the following table.

Section	Parameter	Description
Component	Height	Sets the height of the component
	Width	Sets the width of the component
Component color		Sets the color of the component
Title	Font	Selects the font for the component's title
	Size	Sets the font size of the component's title
	Color	Sets the color of the component's title
	Text	Sets the component's title
Sample		Shows how the component and title will appear with the selected font, size, color, and component color
Protect		Prevents parameter editing when Component protection is on (see page 83)
Bring to front		Brings the component to the forefront

- 3 Make the required settings and then click OK to save your settings, or click Cancel to leave them unchanged.

The Properties window closes and the component appears in accordance with the Properties settings.

If the component selected before choosing the Properties command is a User Module, the User Module tab appears in addition to the General tab, as shown below.



The User Module parameters are explained in the following table.

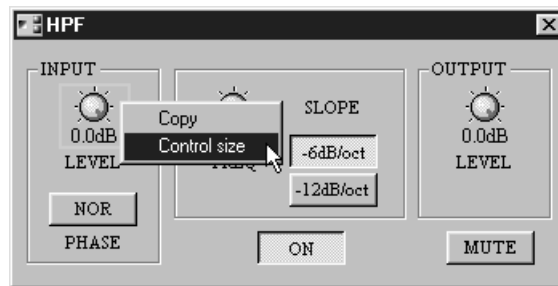
Section	Parameter	Range	Description
Component Nodes	Input	0–16	Sets the number of input nodes
	Output	0–16	Sets the number of output nodes



## Changing the Size of Rotary Controls & Sliders

The size of individual rotary controls and sliders can be changed as follows.

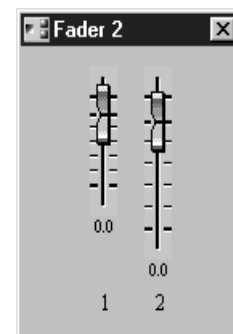
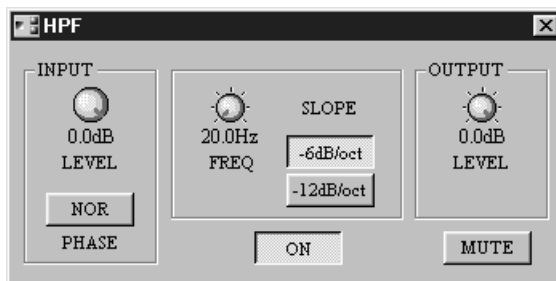
- 1 Open the control window as normal.  
The control window opens.
- 2 Select the rotary control or slider.  
The rotary control or slider appears highlighted.
- 3 While holding down the Shift key, right-click over the control.  
The following pop-up menu appears.



- 4 Choose Control Size.  
The Control Size window appears, as shown below.



- 5 Select a size and then click OK to save your settings, or click Cancel to leave them unchanged.  
The Properties window closes and the control appears at the selected size.  
Examples of large and small rotary controls and sliders are shown below.



## Using Password Protection

The Protection function is for use mainly in Run mode, when DME Designer is used to control the DME32, and can be used to restrict component parameter editing or to prevent any operation whatsoever. Three levels of protection are available: full access, limited access, and no access. Note that this protection function has nothing to do with the DME32's front panel Protect function.

Passwords can be assigned to the Off and Component modes, preventing unauthorized mode changes. Operation mode does not have its own password, although you'd need to know either the Off or Component password in order to switch from Operation mode. Passwords can be up to 16 characters long.

The current protection setting is shown in the protection section of the status bar. See "Status bar" on page 25 for more information.

The three protection modes are explained below.

**Off**—This mode offers full access to all functions. If the Off password has been set, it must be entered in order to switch to Off mode from either Component or Operation mode.

**Component**—This mode offers limited access. Components whose Protect option is checked (see page 80) cannot be edited. Other components can be edited and scenes can be stored or recalled as normal. If the Component password has been set, it must be entered in order to switch to Component mode from either Off or Operation mode.

**Operation**—This mode offers no access. Component parameters cannot be edited, scenes cannot be stored or recalled, and configurations cannot be recalled. If the Off or Component password has been set, the correct password must be entered in order to switch from Operation mode to that mode.

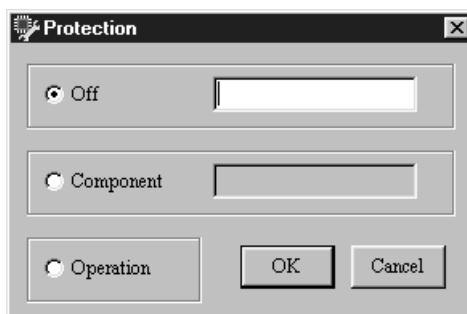
The following table shows exactly what can and cannot be done in each mode.

	Operation	Component
Recall configurations	No	No
Recall scenes	No	Yes
Edit component parameters	No	Components whose Protect option is on cannot be edited. Other components can be edited.
Edit configurations	No	No
Save configurations	Yes	Yes
Save configurations under a new name	Yes	Yes
Open new configuration windows	No	No
Open saved configurations	No	No
Send configurations to the DME32	No	No
Receive configurations from the DME32	No	No
Change mode (Edit, Cable, Run)	Yes	Yes
Print	No	No
Close configurations	Yes	Yes
Zoom configuration windows	No	No
Quit DME Manager	Yes	Yes

## Setting the Passwords

- 1 Choose Protection from the Tool menu.

The Protection window opens, as shown below.



When a password has been set, it appears with asterisks in place of each character.

- 2 Enter the Off password.
- 3 Click OK to save the password, or click Cancel to forget it.  
If you click OK, the Password input window appears.
- 4 Confirm the Off password by entering it again, and then click OK.  
If you enter the password correctly, the Off password is set and the Protection window closes. If you enter it incorrectly, an error message appears. Reenter the correct password or cancel the operation.
- 5 Choose Protection from the Tool menu again.  
The Protection window opens.
- 6 Select Component and click OK.  
The Protection window closes.
- 7 Choose Protection from the Tool menu again.  
The Protection window opens.
- 8 This time enter the Component password.
- 9 Click OK to save the password, or click Cancel to forget it.  
If you click OK, the Password input window appears.
- 10 Confirm the Component password by entering it again, and then click OK.  
If you enter the password correctly, the Component password is set and the Protection window closes. If you enter it incorrectly, an error message appears. Reenter the correct password or cancel the operation.  
The passwords are now set.

## Changing Passwords

To change the Off or Component password, first select the Off or Component mode. On the protection window, enter the new password and click OK. You'll be asked to enter the old password and then the new password. If you enter them correctly, the new password is set and the Protection window closes.

## Deleting Passwords

To delete the Off or Component password, first select the Off or Component mode. On the protection window, highlight the password and delete it by pressing the Delete key. Then click OK. You'll be asked to enter the old password. If you enter it correctly, the password is deleted and the Protection window closes.

## Forgotten Passwords?

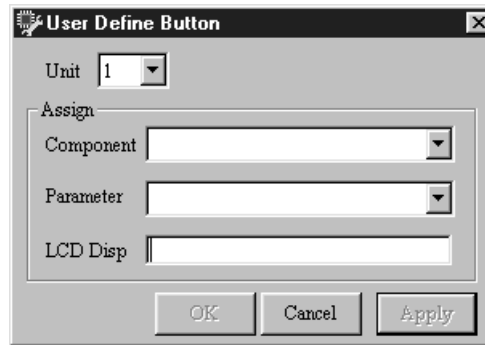
If you forget a password, enter "OVERRIDE" in order to bypass the protection function.

## Assigning the User Define Button

The front panel [USER DEFINE] button can provide direct access to a specific parameter. Different user define settings can be stored in each scene.

- 1 Choose User Define Button from the Tool menu.

The User Define Button window opens, as shown below.



The User Define Button parameters are explained in the following table.

Section	Parameter	Range	Description
Unit		1–4	Selects the DME32 whose [USER DEFINE] button is to be assigned
Assign	Component	1	Selects the component whose parameter is to be assigned
	Parameter	2	Selects the parameter to be assigned
	LCD Disp	Up to 15 characters	The text that appears on the DME32 display when its [USER DEFINE] button is pressed

1. Components in the current configuration can be selected.
2. Depends on the selected component.

- 2 Make the required settings and then click Apply to apply your settings and leave the User Define Button window open, click OK to apply your settings and close the window, or click Cancel to leave the settings unchanged and close the window.
- 3 Use the Offline Edit window to save your settings to a scene.

The User Define Button window closes.

Using the Apply button instead of the OK button is convenient when working offline, as it allows you to edit and view user define button settings for each scene without having to keep opening and closing the User Define Button window.

You must compile and transfer the configuration to the DME32 for the User Define Button settings to take effect. See “How to Build & Edit Configurations” on page 44 for more information.

For information on using the [USER DEFINE] button, see “Editing Parameters & the User Define Button” on page 201.

# Printing

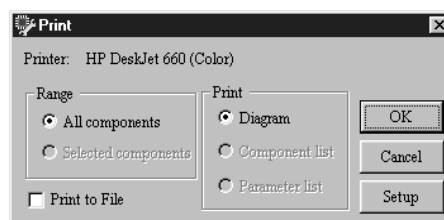
The Print function allows you to print information about the current configuration, including a diagram, component list, or parameter list. You can print information about all components in the current configuration or selected components only.

- 1 To print information about the entire configuration, make sure that no components are selected before choosing the Print command.
- 2 To print information about one or more components, select the components before choosing the Print command.

All components can be selected by pressing CTRL+A.

- 3 Choose Print from the File menu.

The Print window appears, as shown below.



If you need to select and configure your printer, click Setup. The standard Windows Printer Setup window appears. This window can also be opened by choosing Printer Setup from the File menu. When you've configured your printer, click OK to save your settings, or click Cancel to leave them unchanged. The Printer Setup window closes.

The name of the selected printer appears in the Print window, as shown above.

- 4 Set the Print parameters as required.

Section	Parameter	Description
Range	All components	This option is set according to what was selected when the Print command was chosen and cannot be changed here. If nothing was selected, Range is set to "All components" and information about all the components in the current configuration is printed. If one or more components were selected, it is set to "Selected components" and information about the selected components is printed.
	Selected components	
Print	Diagram	Prints the configuration diagram: all components or selected components only
	Component list	Prints a list of the selected components
	Parameter list	Prints a list of the selected component's parameters and their settings

- 5 To print to a file instead of a printer, select the Print to File check box.
- 6 Click OK to print, or click Cancel to cancel printing.

Printing starts. If you selected Print to File, the Save As window appears. Specify the file name and folder where you want to save the print file, and then click OK, or click Cancel to cancel printing.

# Component Guide Part I

---

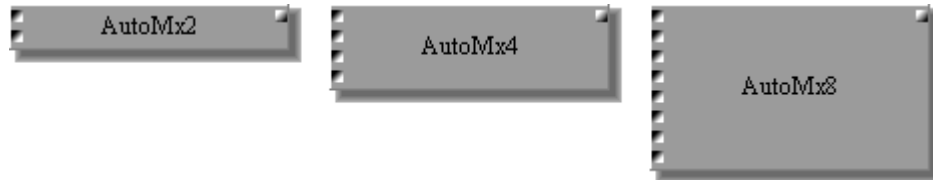
# 8

## In this chapter...

Automatic Mixer .....	90
Cascade .....	92
Crossover .....	93
Crossover Processor .....	102
Delay .....	120
Delayed Mixer .....	122
Dynamics .....	125

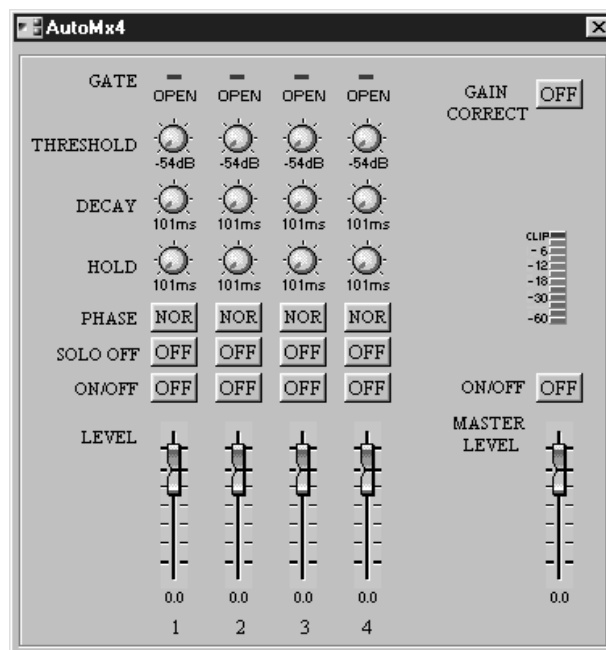
## Automatic Mixer

There are three components in the Automatic Mixer group, each with a single output and 2, 4, or 8 inputs. Each input channel features a noise gate, which lets the input signal through only when it exceeds the specified threshold. The Gain Correct function reduces the possibility of acoustic feedback by automatically adjusting the output level depending on the number of channels that are open.



Since the only difference between all the Auto Mixer components is the number of inputs, only the 4 Channel Auto Mixer control window is shown here.

Each Auto Mixer control window features input channels and a master output section.



When a channel is soloed, “SOLO OFF” changes to “SOLO ON.”



The GATE OPEN indicators light up when the input signal exceeds the specified threshold, indicating that the gate is open. The meter displays the level of the output signal.

Section	Parameter	Range	Description
<b>GAIN CORRECT</b>		ON/OFF	See below.
<b>Input Channel</b>	<b>THRESHOLD</b>	-54 dB to 0 dB	Adjusts the threshold level of each gate
	<b>DECAY</b>	1	Adjusts the closing speed of each gate
	<b>HOLD</b>	2	Adjusts the hold time of each gate
	<b>PHASE</b>	NOR/REV	Inverts each input channel signal
	<b>SOLO</b>	ON/OFF	Solos each input channel
	<b>ON/OFF</b>	ON/OFF	Mutes each input channel
	<b>LEVEL</b>	-Infinity dB to 6.0 dB	Adjusts the input level of each channel
<b>MASTER</b>	<b>ON/OFF</b>	ON/OFF	Mutes the output
	<b>LEVEL</b>	-Infinity dB to 6.0 dB	Adjusts the output level

1. 110 ms–46.0 sec (fs = 44.1 kHz), 101 ms–42.3 sec (fs = 48 kHz)
2. 110 ms–2.13 sec (fs = 44.1 kHz), 101 ms–1.96 sec (fs = 48 kHz)

In applications that use a large number of microphones, such as conferences, if many channels are open at the same time, there is a risk of acoustic feedback. The Gain Correct function automatically reduces the output level depending on the number of channels that are open, thereby reducing this risk.

## Cascade

Cascade components are used to share and distribute signals among DME32s in a multiple-unit system, much like the buses in a mixing console. There are 32 components in the Cascade group, providing 32 cascade channels.

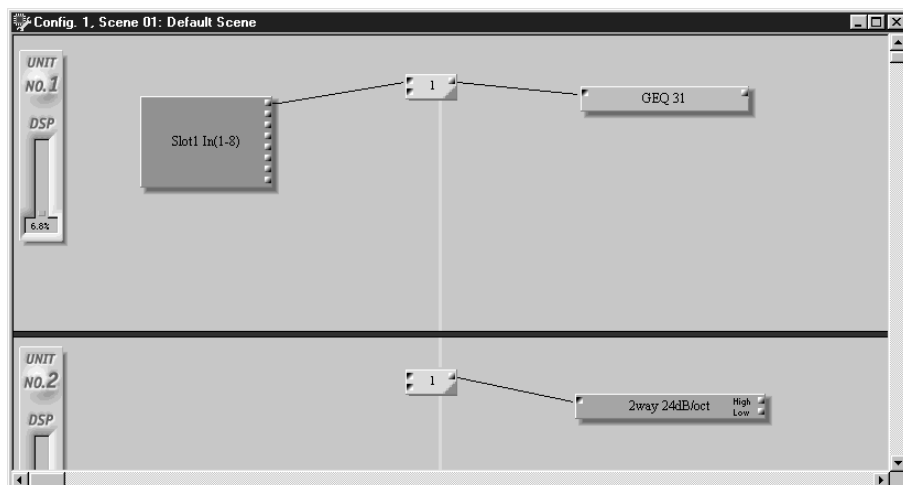
Cascade components consist of bus-like lines running through all four sections of the configuration window, with two inputs and one output available in each section, as shown below.



There are no control windows for the Cascade components.

Signals from each DME32 can be connected to the Cascade component's inputs, distributed along the cascade channel, and fed to any other DME32.

In the following example, Cascade channel #1 is used to distribute input signal #1 of DME32 #1 to a 31-band GEQ in DME32 #1 and a 2-way crossover in DME32 #2.



## Crossover

There are 12 components in the Crossover group, with 2-way, 3-way, and 4-way crossovers with 12 dB/octave, 24 dB/octave, 36 dB/octave, and 48 dB/octave slopes. Crossover filter types include Butterworth, Bessel, and Linkwitz-Riley, which are explained below.

**Bessel**—A type of filter characterized by its virtually linear phase response (i.e., the amount of phase change is the same for all frequencies within the pass band). Although it has a more gradual roll off than a Butterworth filter, it will pass a square wave without causing ringing.

**Butterworth**—Being the most common type of filter, filters are typically always Butterworth, unless otherwise stated. It has a flat pass band and a  $-3$  dB gain at the cutoff frequency.

**Linkwitz-Riley**—This filter offers slopes of 12 dB, 24 dB, 48 dB, etc. When the output signal from its LPF and HPF are combined, the gain over the entire range is flat. Like the Butterworth filter, it has a flat pass band. The gain at the cutoff frequency is  $-6$  dB.

**Adjustable Gc**—Filters with an Adjustable Gc allow you to adjust the gain at the cutoff frequency. With Gc set to  $-3$  dB, the filter is practically a Butterworth filter. And with the SLOPE & TYPE set to 12 dB/oct Adjustable Gc, 24 dB/oct Adjustable Gc, or 48 dB/oct Adjustable Gc, and Gc set to  $-6$  dB, the filter is practically a Linkwitz-Riley filter. With Gc settings greater than  $-3$  dB, boost occurs around the cutoff frequency.

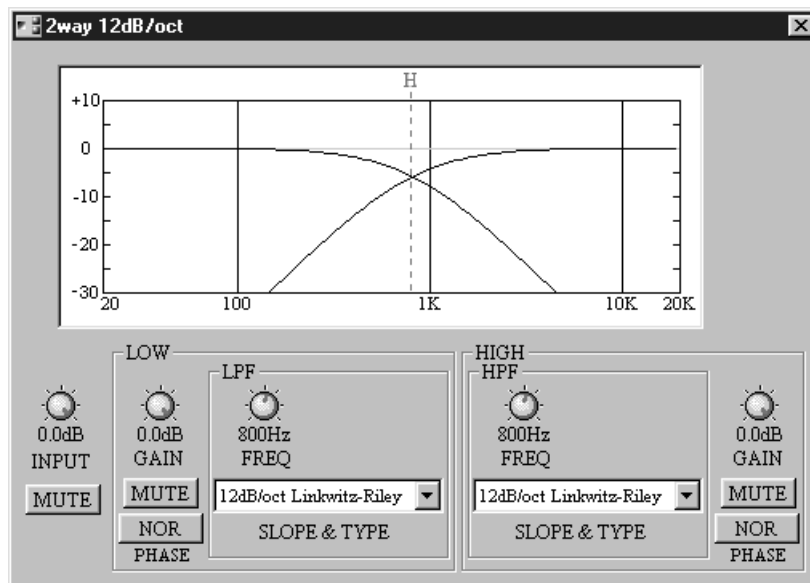
## 2-Way Crossovers

A 2-way crossover splits the input signal into two frequency channels: high and low. Four slope types are available: 12 dB/octave, 24 dB/octave, 36 dB/octave, and 48 dB/octave.



Each 2-way Crossover component features one input and two outputs: High and Low. Since the only difference between all the 2-way Crossover components is the filter slope, only the 2 Way 12 dB/octave control window is shown here.

Each 2-way Crossover control window features a crossover graph and INPUT, LOW, and HIGH sections.



The crossover graph at the top of the window displays the crossover settings graphically. A vertical dotted line indicates the crossover frequency of each channel: “L” for low and “H” for high.

Note that the Gc controls (not shown here) appear only when an Adjustable Gc type SLOPE & TYPE filter is selected.

Section	Parameter	Range	Description	
INPUT	Level	–Infinity dB to 0.0 dB	Adjusts the input signal level	
	MUTE	ON/OFF	Mutes the input	
LOW	GAIN	–Infinity dB to 0.0 dB	Adjusts the LOW output signal level	
	MUTE	ON/OFF	Mutes the LOW output	
	PHASE	NOR/REV	Inverts the LOW output signal	
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the LOW LPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the LOW LPF gain at the cutoff frequency
SLOPE & TYPE		<sup>2</sup>	Sets the LOW LPF filter slope and type	
HIGH	GAIN	–Infinity dB to 0.0 dB	Adjusts the HIGH output signal level	
	MUTE	ON/OFF	Mutes the HIGH output	
	PHASE	NOR/REV	Inverts the HIGH output signal	
	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the HIGH HPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the HIGH HPF gain at the cutoff frequency
SLOPE & TYPE		<sup>2</sup>	Sets the HIGH HPF filter slope and type	

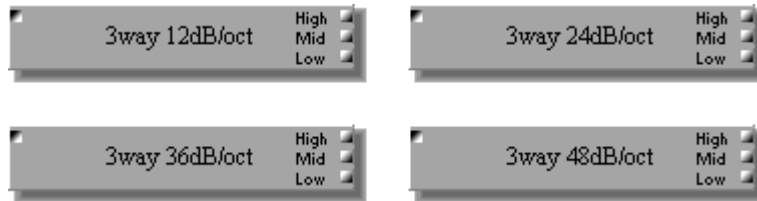
1. Gc controls appears only when a Gc SLOPE & TYPE filter is selected. For Butterworth, Bessel, and Linkwitz-Riley, the Gc setting is ignored and the Gc value is fixed as follows: Butterworth and Bessel: –3 dB, Linkwitz-Riley: –6 dB.
2. SLOPE & TYPE parameter values are listed in the following table.

The following table shows the SLOPE & TYPE settings available for each filter slope.

SLOPE & TYPE	Slope			
	12 dB/oct	24 dB/oct	36 dB/oct	48 dB/oct
THRU	○	○	○	○
6dB/oct	○	○	○	○
12dB/oct Adjustable Gc	○	○	○	○
12dB/oct Butterworth	○	○	○	○
12dB/oct Bessel	○	○	○	○
12dB/oct Linkwitz-Riley	○	○	○	○
18dB/oct Adjustable Gc	—	○	○	○
18dB/oct Butterworth	—	○	○	○
18dB/oct Bessel	—	○	○	○
24dB/oct Adjustable Gc	—	○	○	○
24dB/oct Butterworth	—	○	○	○
24dB/oct Bessel	—	○	○	○
24dB/oct Linkwitz-Riley	—	○	○	○
36dB/oct Adjustable Gc	—	—	○	○
36dB/oct Butterworth	—	—	○	○
36dB/oct Bessel	—	—	○	○
48dB/oct Adjustable Gc	—	—	—	○
48dB/oct Butterworth	—	—	—	○
48dB/oct Bessel	—	—	—	○
48dB/oct Linkwitz-Riley	—	—	—	○

### 3-Way Crossovers

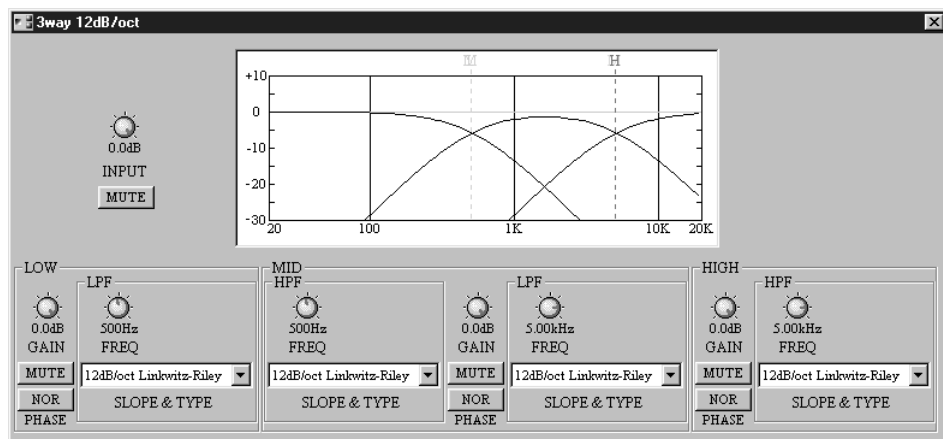
A 3-way crossover splits the input signal into three frequency channels: low, mid, and high. Four slope types are available: 12 dB/octave, 24 dB/octave, 36 dB/octave, and 48 dB/octave.



Each 3-way Crossover component features one input and three outputs: High, Mid, and Low.

Since the only difference between all the 3-way Crossover components is the filter slope, only the 3 Way 12 dB/octave control window is shown here.

Each 3-way Crossover control window features a crossover graph and INPUT, LOW, MID, and HIGH sections.



The crossover graph at the top of the window displays the crossover settings graphically. A vertical dotted line indicates the crossover frequency of each channel: “L” for low, “M” for mid, and “H” for high.

Note that the Gc controls (not shown here) appear only when an Adjustable Gc type SLOPE & TYPE filter is selected.

Section	Parameter	Range	Description	
INPUT	Level	–Infinity dB to 0.0 dB	Adjusts the input signal level	
	MUTE	ON/OFF	Mutes the input	
LOW	GAIN	–Infinity dB to 0.0 dB	Adjusts the LOW output signal level	
	MUTE	ON/OFF	Mutes the LOW output	
	PHASE	NOR/REV	Inverts the LOW output signal	
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the LOW LPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the LOW LPF gain at the cutoff frequency
SLOPE & TYPE		<sup>2</sup>	Sets the LOW LPF filter slope and type	
MID	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the MID HPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the MID HPF gain at the cutoff frequency
		SLOPE & TYPE	<sup>2</sup>	Sets the MID HPF filter slope and type
	GAIN	–Infinity dB to 0.0 dB	Adjusts the MID output signal level	
	MUTE	ON/OFF	Mutes the MID output	
	PHASE	NOR/REV	Inverts the MID output signal	
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the MID LPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the MID LPF gain at the cutoff frequency
		SLOPE & TYPE	<sup>2</sup>	Sets the MID LPF filter slope and type
	HIGH	GAIN	–Infinity dB to 0.0 dB	Adjusts the HIGH output signal level
MUTE		ON/OFF	Mutes the HIGH output	
PHASE		NOR/REV	Inverts the HIGH output signal	
HPF		FREQ	20.0 Hz–20.0 kHz	Adjusts the HIGH HPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the HIGH HPF gain at the cutoff frequency
		SLOPE & TYPE	<sup>2</sup>	Sets the HIGH HPF filter slope and type

1. Gc controls appears only when a Gc SLOPE & TYPE filter is selected. For Butterworth, Bessel, and Linkwitz-Riley, the Gc setting is ignored and the Gc value is fixed as follows: Butterworth and Bessel: –3 dB, Linkwitz-Riley: –6 dB.
2. SLOPE & TYPE parameter values are listed in the following table.

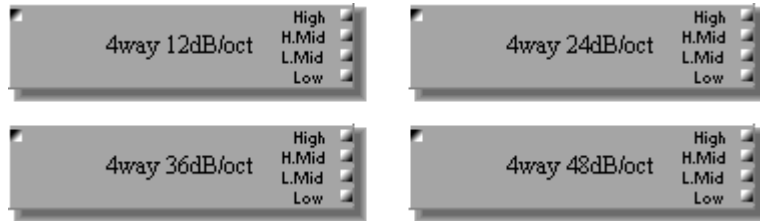
The following table shows the SLOPE & TYPE settings available for each filter slope.

SLOPE & TYPE	Slope			
	12 dB/oct	24 dB/oct	36 dB/oct	48 dB/oct
THRU	○	○	○	○
6dB/oct	○	○	○	○
12dB/oct Adjustable Gc	○	○	○	○
12dB/oct Butterworth	○	○	○	○
12dB/oct Bessel	○	○	○	○
12dB/oct Linkwitz-Riley	○	○	○	○
18dB/oct Adjustable Gc	—	○	○	○
18dB/oct Butterworth	—	○	○	○
18dB/oct Bessel	—	○	○	○
24dB/oct Adjustable Gc	—	○	○	○
24dB/oct Butterworth	—	○	○	○
24dB/oct Bessel	—	○	○	○
24dB/oct Linkwitz-Riley	—	○	○	○
36dB/oct Adjustable Gc	—	—	○	○
36dB/oct Butterworth	—	—	○	○
36dB/oct Bessel	—	—	○	○
48dB/oct Adjustable Gc	—	—	—	○
48dB/oct Butterworth	—	—	—	○
48dB/oct Bessel	—	—	—	○
48dB/oct Linkwitz-Riley	—	—	—	○



## 4-Way Crossovers

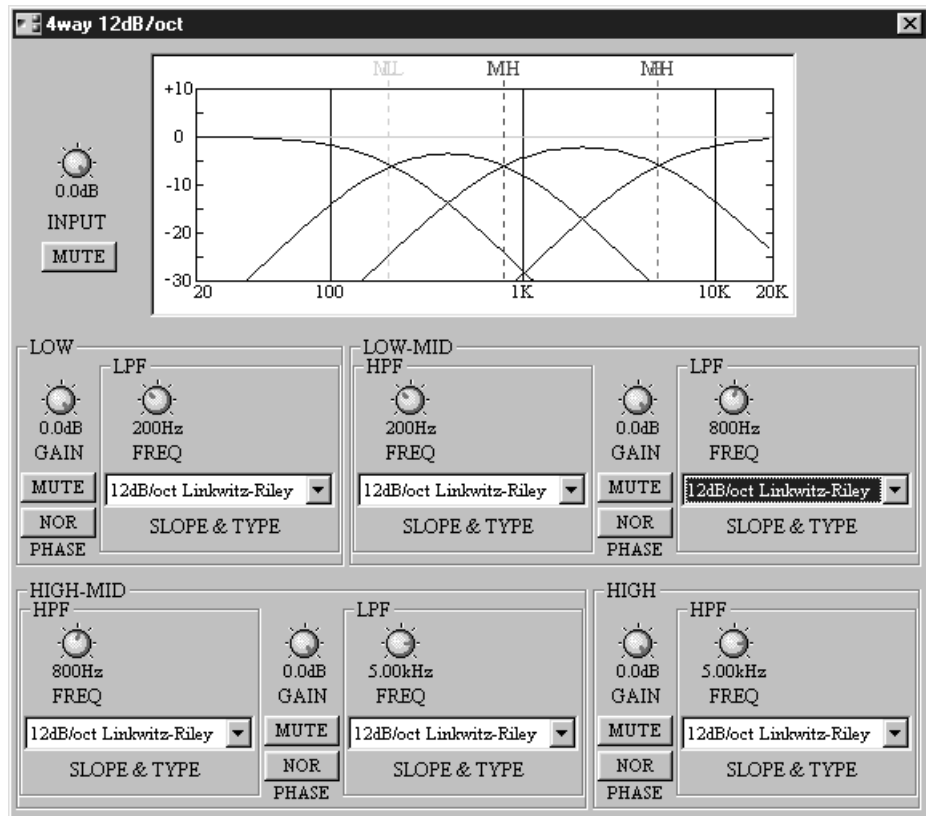
A 4-way crossover splits the input signal into four frequency channels: low, low-mid, high-mid, and high. Four slope types are available: 12 dB/octave, 24 dB/octave, 36 dB/octave, and 48 dB/octave.



Each 4-way Crossover component features one input and four outputs: High, High-Mid, Low-Mid, and Low.

Since the only difference between all the 4-way Crossover components is the filter slope, only the 4 Way 12 dB/octave control window is shown here.

Each 4-way Crossover control window features a crossover graph and INPUT, LOW, LOW-MID, HIGH-MID, and HIGH sections.



The crossover graph at the top of the window displays the crossover settings graphically. A vertical dotted line indicates the crossover frequency of each channel: “L” for low, “ML” for low-mid, “MH” for high-mid, and “H” for high.

Note that the Gc controls (not shown here) appear only when an Adjustable Gc type SLOPE & TYPE filter is selected.

Section	Parameter	Range	Description	
INPUT	Level	–Infinity dB to 0.0 dB	Adjusts the input signal level	
	MUTE	ON/OFF	Mutes the input	
LOW	GAIN	–Infinity dB to 0.0 dB	Adjusts the LOW output signal level	
	MUTE	ON/OFF	Mutes the LOW output	
	PHASE	NOR/REV	Inverts the LOW output signal	
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the LOW LPF cutoff frequency
		Gc <sup>1</sup>	–6 dB to +6 dB	Adjusts the LOW LPF gain at the cutoff frequency
SLOPE & TYPE		<sup>2</sup>	Sets the LOW LPF filter slope and type	
LOW-MID	HPF	FREQ	20.0 Hz–20.0 kHz	
		Gc <sup>1</sup>	–6 dB to +6 dB	
		SLOPE & TYPE	<sup>2</sup>	
	GAIN	–Infinity dB to 0.0 dB	Adjusts the LOW-MID output signal level	
	MUTE	ON/OFF	Mutes the LOW-MID output	
	PHASE	NOR/REV	Inverts the LOW-MID output signal	
	LPF	FREQ	20.0 Hz–20.0 kHz	
		Gc <sup>1</sup>	–6 dB to +6 dB	
		SLOPE & TYPE	<sup>2</sup>	
	HIGH-MID	HPF	FREQ	20.0 Hz–20.0 kHz
Gc <sup>1</sup>			–6 dB to +6 dB	
SLOPE & TYPE			<sup>2</sup>	
GAIN		–Infinity dB to 0.0 dB	Adjusts the HIGH-MID output signal level	
MUTE		ON/OFF	Mutes the HIGH-MID output	
PHASE		NOR/REV	Inverts the HIGH-MID output signal	
LPF		FREQ	20.0 Hz–20.0 kHz	
		Gc <sup>1</sup>	–6 dB to +6 dB	
		SLOPE & TYPE	<sup>2</sup>	
HIGH		GAIN	–Infinity dB to 0.0 dB	Adjusts the HIGH output signal level
	MUTE	ON/OFF	Mutes the HIGH output	
	PHASE	NOR/REV	Inverts the HIGH output signal	
	HPF	FREQ	20.0 Hz–20.0 kHz	
		Gc <sup>1</sup>	–6 dB to +6 dB	
		SLOPE & TYPE	<sup>2</sup>	

1. Gc controls appears only when a Gc SLOPE & TYPE filter is selected. For Butterworth, Bessel, and Linkwitz-Riley, the Gc setting is ignored and the Gc value is fixed as follows: Butterworth and Bessel: –3 dB, Linkwitz-Riley: –6 dB.
2. SLOPE & TYPE parameter values are listed in the following table.

The following table shows the SLOPE & TYPE settings available for each filter slope.

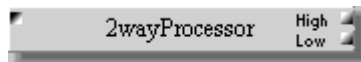
SLOPE & TYPE	Slope			
	12 dB/oct	24 dB/oct	36 dB/oct	48 dB/oct
THRU	○	○	○	○
6dB/oct	○	○	○	○
12dB/oct Adjustable Gc	○	○	○	○
12dB/oct Butterworth	○	○	○	○
12dB/oct Bessel	○	○	○	○
12dB/oct Linkwitz-Riley	○	○	○	○
18dB/oct Adjustable Gc	—	○	○	○
18dB/oct Butterworth	—	○	○	○
18dB/oct Bessel	—	○	○	○
24dB/oct Adjustable Gc	—	○	○	○
24dB/oct Butterworth	—	○	○	○
24dB/oct Bessel	—	○	○	○
24dB/oct Linkwitz-Riley	—	○	○	○
36dB/oct Adjustable Gc	—	—	○	○
36dB/oct Butterworth	—	—	○	○
36dB/oct Bessel	—	—	○	○
48dB/oct Adjustable Gc	—	—	—	○
48dB/oct Butterworth	—	—	—	○
48dB/oct Bessel	—	—	—	○
48dB/oct Linkwitz-Riley	—	—	—	○

## Crossover Processor

There are three components in the Crossover Processor group: 2-Way, 3-Way, and 4-Way. Each processor consists of a delay, crossover, 3-band PEQ, and compressor. Crossover slopes include 12 dB/octave, 24 dB/octave, 36 dB/octave, and 48 dB/octave, and filter types include Butterworth, Bessel, and Linkwitz-Riley. In addition to the features found on the standard Crossover components, the low channel of each Crossover Processor features a HPF for removing unwanted low-frequency signals.

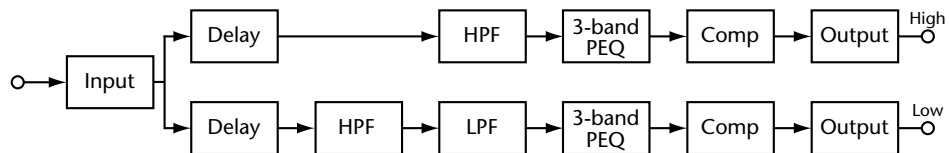
### 2-Way Processor

The 2-Way Processor component splits the input signal into two frequency channels—high and low—with delay, 3-band PEQ, and compressor on each channel.

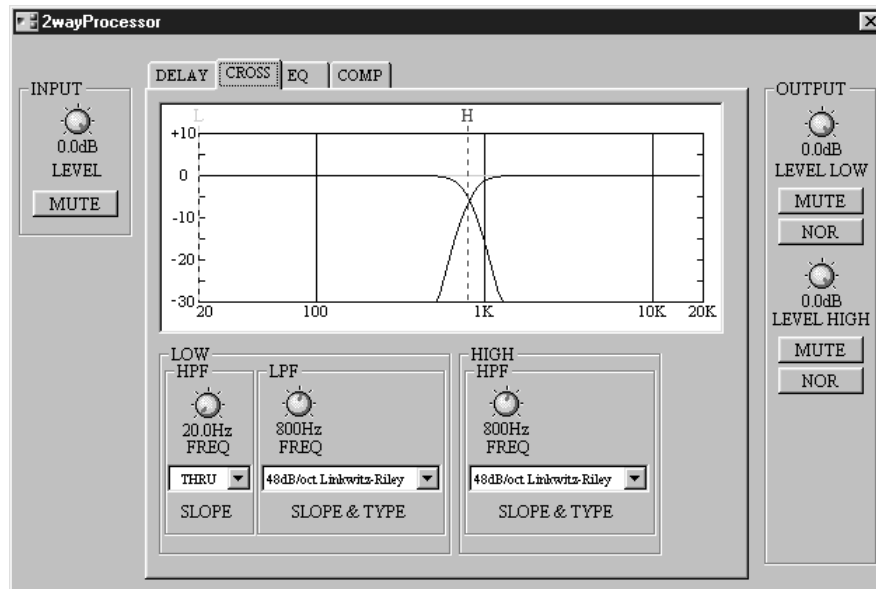


The 2-Way Processor component features one input and two outputs: High and Low.

The following block diagram offers an overview of the 2-Way Processor.



The 2-Way Processor control window features INPUT, OUTPUT, and control sections, with DELAY, CROSS, EQ, and COMP pages selected by clicking the tabs along the top of the control window, as shown below.

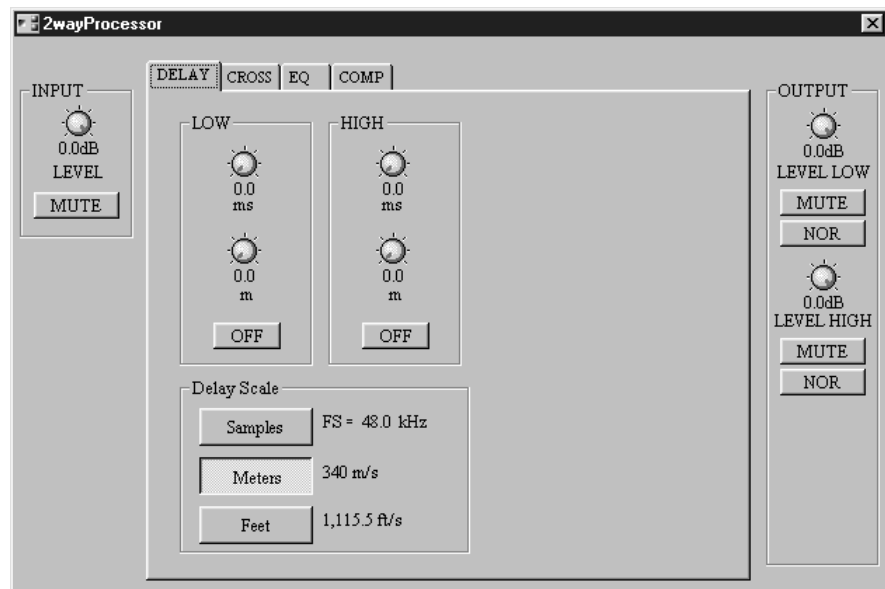


The INPUT and OUTPUT sections of the control window are displayed regardless of which tab is clicked, and their parameters are explained in the following table.

Section	Parameter	Range	Description
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	MUTE	ON/OFF	Mutes the input
OUTPUT LOW	LEVEL	–Infinity dB to 0.0 dB	Adjusts the low output signal level
	MUTE	ON/OFF	Mutes the low output
	PHASE	NOR/REV	Inverts the low output signal
OUTPUT HIGH	LEVEL	–Infinity dB to 0.0 dB	Adjusts the high output signal level
	MUTE	ON/OFF	Mutes the high output
	PHASE	NOR/REV	Inverts the high output signal

## Delay

The DELAY page features individual delays for the low and high channels. Delay times can be specified in milliseconds or samples, meters, or feet.



The Delay parameters for both channels are explained in the following table.

Section	Parameter	Range	Description
LOW, HIGH	ms	0.0–500.0 ms	Sets the delay time in milliseconds (linked to control below)
	m <sup>1</sup>	See the following table	Sets the delay time in the units chosen using the DELAY SCALE buttons (linked to ms control)
	ON/OFF	ON/OFF	Turns the delay on and off
DELAY SCALE		See the following table	Selects the delay units for the Sample controls

1. This control's label depends on the Delay Scale setting.

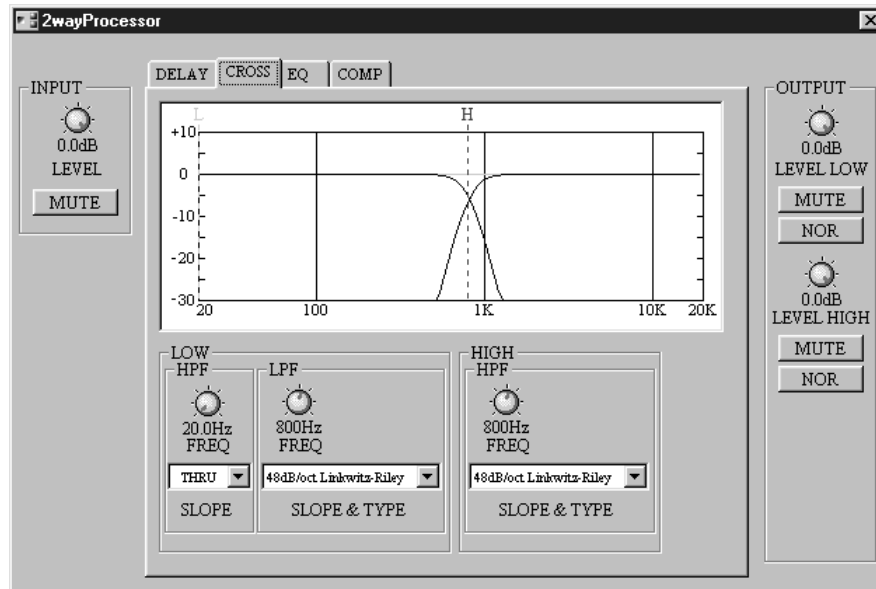
In the DELAY SCALE section, “FS” indicates the selected wordclock frequency, and “340 m/s” and “1,115.5 ft/s” are the speed of sound in meters and feet respectively (air temperature = 14°C, 57.2°F).

The parameter ranges for the Samples, Meters, and Feet settings are as follows:

Delay Scale	FS = 48 KHz	FS = 44.1 kHz
Samples	0–24000 samples	0–22050 samples
Meters	0.0–170.0 meters	
Feet	0.0–557.8 feet	

**Cross**

The CROSS page features the 2-way crossover controls and crossover graph.



Note that the Gc controls (not shown here) appear only when an Adjustable Gc type SLOPE & TYPE filter is selected.

The crossover graph at the top of the window displays the crossover settings graphically. A vertical dotted line indicates the crossover frequency of each channel: “L” for low and “H” for high.

The crossover parameters are explained in the following table.

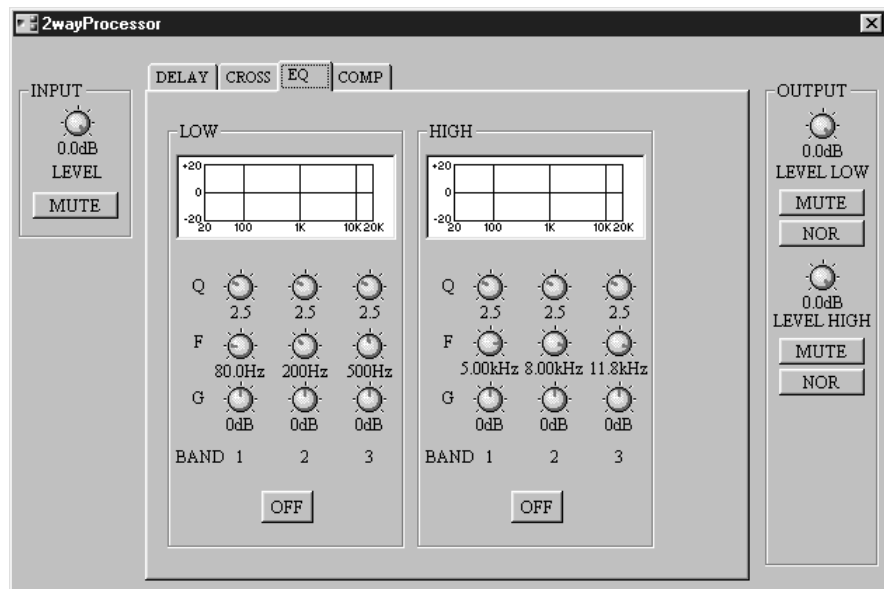
Section	Parameter	Range	Description
LOW	HPF	FREQ	20.0 Hz–20.0 kHz
		SLOPE	1
	LPF	FREQ	20.0 Hz–20.0 kHz
		Gc <sup>2</sup>	–6 dB to +6 dB
		SLOPE & TYPE	3
HIGH	HPF	FREQ	20.0 Hz–20.0 kHz
		Gc <sup>2</sup>	–6 dB to +6 dB
	SLOPE & TYPE	2	

1. THRU (filter off), 6dB/oct, 12dB/oct, 18dB/oct, 24dB/oct (Butterworth).
2. Gc controls appears only when a Gc SLOPE & TYPE filter is selected. For Butterworth, Bessel, and Linkwitz-Riley, the Gc setting is ignored and the Gc value is fixed as follows: Butterworth and Bessel: –3 dB, Linkwitz-Riley: –6 dB.
3. SLOPE & TYPE parameter values are as follows:

THRU (filter off)	18dB/oct Adjustable Gc	36dB/oct Adjustable Gc
6dB/oct	18dB/oct Butterworth	36dB/oct Butterworth
	18dB/oct Bessel	36dB/oct Bessel
12dB/oct Adjustable Gc		
12dB/oct Butterworth	24dB/oct Adjustable Gc	48dB/oct Adjustable Gc
12dB/oct Bessel	24dB/oct Butterworth	48dB/oct Butterworth
12dB/oct Linkwitz-Riley	24dB/oct Bessel	48dB/oct Bessel
	24dB/oct Linkwitz-Riley	48dB/oct Linkwitz-Riley

## EQ

The EQ page features 3-band parametric EQ for the low and high channels.



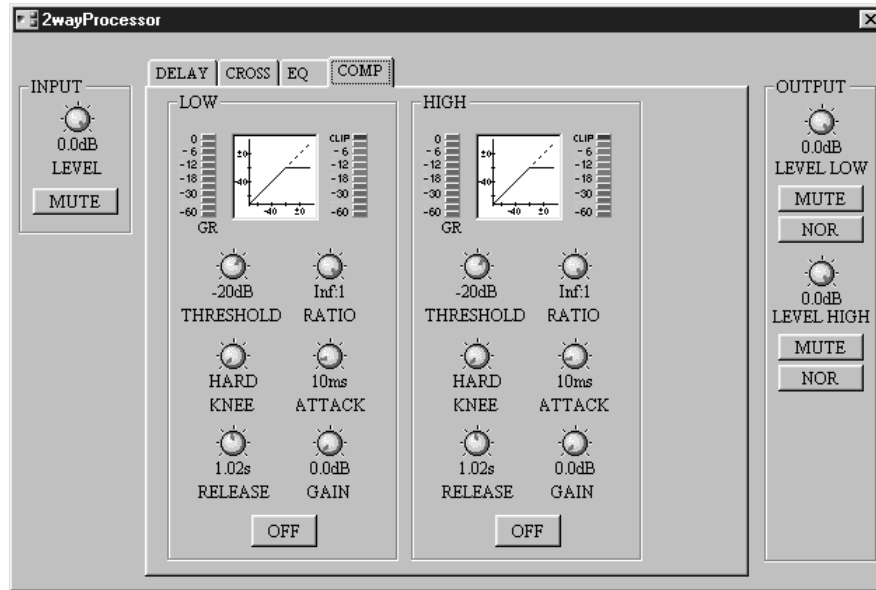
The EQ graph above each set of controls displays the EQ settings graphically.

The EQ parameters for both channels explained in the following table.

Section	Parameter	Range	Description
LOW, HIGH	Q	10.0–0.1	Adjusts the selectivity of each band
	F	20.0 Hz–20.0 kHz	Adjusts the frequency of each band
	G	–18 dB to +18 dB	Adjusts the gain of each band
	ON/OFF	ON/OFF	Turns the EQ on and off

### Comp

The COMP page features compressors for the high and low channels, with gain reduction (GR) meters, compressor curves, and output level meters.



The gain reduction (GR) meters display the amount of gain reduction being applied by the Compressors. The compressor curves display the effect of the Compressors. The output meters display the level of the output signals.

The compressor parameters for both channels are explained in the following table.

Parameter	Range	Description
<b>THRESHOLD</b>	-54 dB to 0 dB	Adjusts the threshold level
<b>RATIO</b>	1:1 to Infinity:1	Adjusts the compression ratio
<b>KNEE</b>	HARD, 1, 2, 3, 4, 5	Adjusts the Compressor's "hardness"
<b>ATTACK</b>	0 ms–120 ms	Adjusts the attack time
<b>RELEASE</b>	1	Adjusts the release time
<b>GAIN</b>	0.0 dB to +18.0 dB	Adjusts the output gain
<b>ON/OFF</b>	ON/OFF	Turns the Compressor on and off

1. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

See page 128 for more general information on compressor parameters.



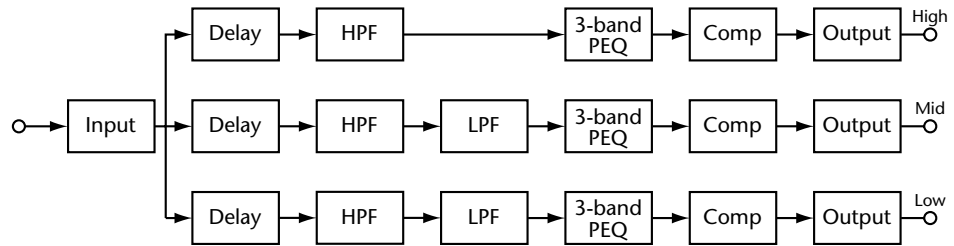
### 3-Way Processor

The 3-Way Processor component splits the input signal into three frequency channels—high, mid, and low—with delay, 3-band PEQ, and compressor on each channel.

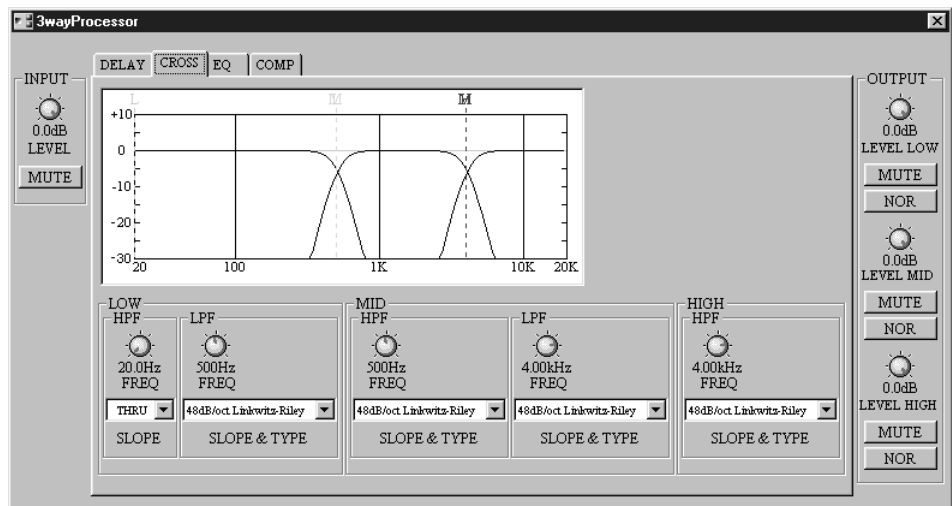


The 3-Way Processor component features one input and three outputs: High, Mid, and Low.

The following block diagram offers an overview of the 3-Way Processor.



The 3-Way Processor control window features INPUT, OUTPUT, and control sections, with DELAY, CROSS, EQ, and COMP pages selected by clicking the tabs along the top of the control window, as shown below.

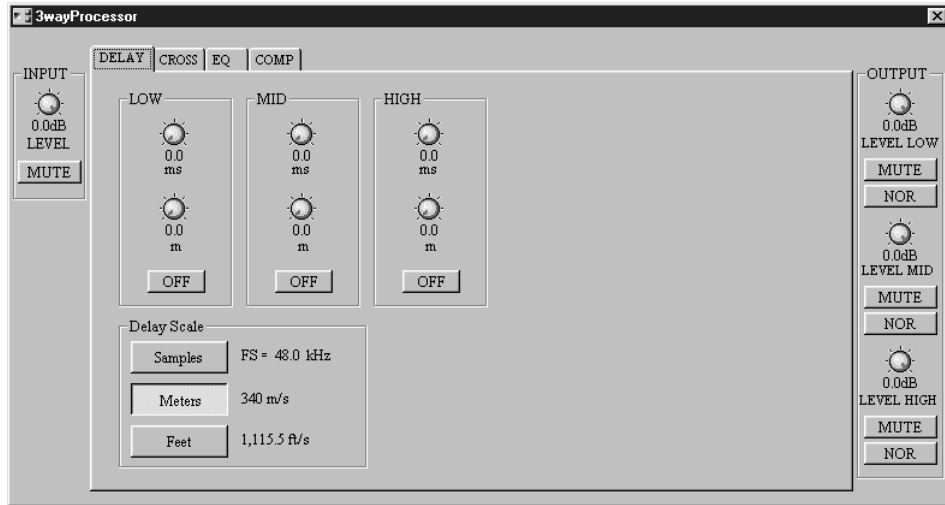


The INPUT and OUTPUT sections of the control window are displayed regardless of which tab is clicked, and their parameters are explained in the following table.

Section	Parameter	Range	Description
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	MUTE	ON/OFF	Mutes the input
OUTPUT LOW	LEVEL	–Infinity dB to 0.0 dB	Adjusts the low output signal level
	MUTE	ON/OFF	Mutes the low output
	PHASE	NOR/REV	Inverts the low output signal
OUTPUT MID	LEVEL	–Infinity dB to 0.0 dB	Adjusts the mid output signal level
	MUTE	ON/OFF	Mutes the mid output
	PHASE	NOR/REV	Inverts the mid output signal
OUTPUT HIGH	LEVEL	–Infinity dB to 0.0 dB	Adjusts the high output signal level
	MUTE	ON/OFF	Mutes the high output
	PHASE	NOR/REV	Inverts the high output signal

### Delay

The DELAY page features individual delays for the low, mid, and high channels. Delay times can be specified in milliseconds or samples, meters, or feet.



The Delay parameters for all channels are explained in the following table.

Section	Parameter	Range	Description
LOW, MID, HIGH	ms	0.0–500.0 ms	Sets the delay time in milliseconds (linked to control below)
	m <sup>1</sup>	See the following table	Sets the delay time in the units chosen using the DELAY SCALE buttons (linked to ms control)
	ON/OFF	ON/OFF	Turns the delay on and off
DELAY SCALE		See the following table	Selects the delay units for the Sample controls

1. This control’s label depends on the Delay Scale setting.

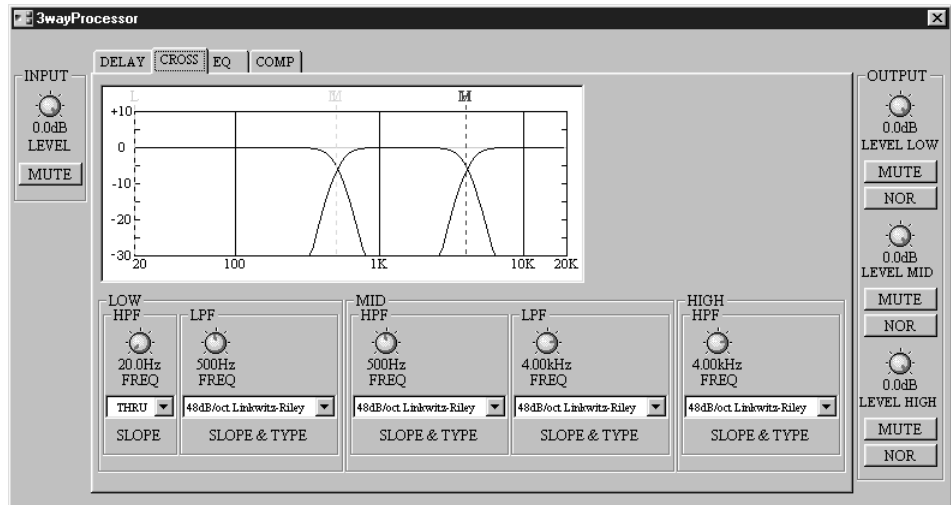
In the DELAY SCALE section, “FS” indicates the selected wordclock frequency, and “340 m/s” and “1,115.5 ft/s” are the speed of sound in meters and feet respectively (air temperature = 14°C, 57.2°F).

The parameter ranges for the Samples, Meters, and Feet settings are as follows:

Delay Scale	FS = 48 KHz	FS = 44.1 kHz
Samples	0–24000 samples	0–22050 samples
Meters	0.0–170.0 meters	
Feet	0.0–557.8 feet	

## Cross

The CROSS page features the 3-way crossover controls and crossover graph.



Note that the Gc controls (not shown here) appear only when an Adjustable Gc type SLOPE & TYPE filter is selected.

The crossover graph at the top of the window displays the crossover settings graphically. A vertical dotted line indicates the crossover frequency of each channel: “L” for low, “M” for mid, and “H” for high.

The crossover parameters are explained in the following table.

Section	Parameter	Range	Description	
LOW	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the low HPF cutoff frequency
		SLOPE	1	Selects the low HPF filter slope
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the low LPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the low LPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the low LPF filter slope and type
MID	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the mid HPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the mid HPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the mid HPF filter slope and type
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the mid LPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the mid LPF gain at the cutoff frequency
SLOPE & TYPE	3	Selects the mid LPF filter slope and type		
HIGH	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the high HPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the high HPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the high HPF filter slope and type

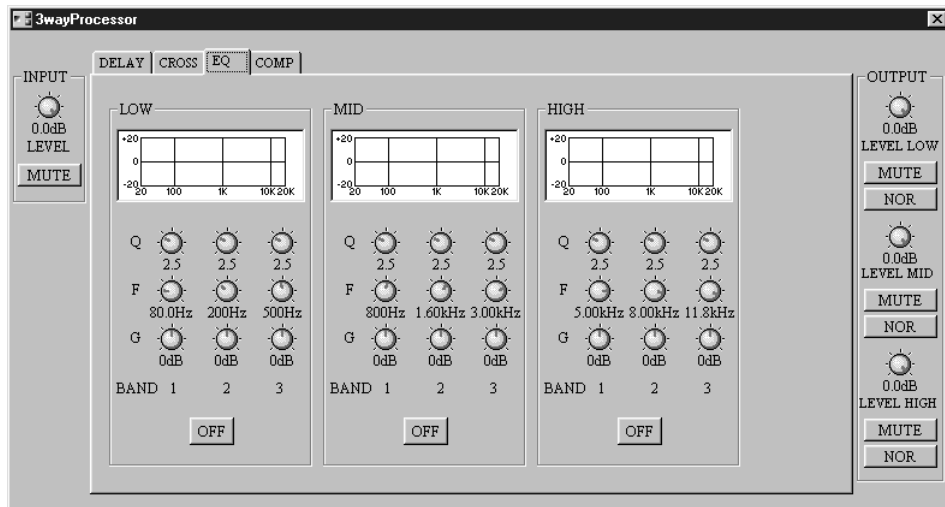
1. THRU (filter off), 6dB/oct, 12dB/oct, 18dB/oct, 24dB/oct (Butterworth).
2. Gc controls appears only when a Gc SLOPE & TYPE filter is selected. For Butterworth, Bessel, and Linkwitz-Riley, the Gc setting is ignored and the Gc value is fixed as follows: Butterworth and Bessel: –3 dB, Linkwitz-Riley: –6 dB.

3. SLOPE & TYPE parameter values are as follows:

THRU (filter off)	18dB/oct Adjustable Gc	36dB/oct Adjustable Gc
6dB/oct	18dB/oct Butterworth	36dB/oct Butterworth
	18dB/oct Bessel	36dB/oct Bessel
12dB/oct Adjustable Gc		
12dB/oct Butterworth	24dB/oct Adjustable Gc	48dB/oct Adjustable Gc
12dB/oct Bessel	24dB/oct Butterworth	48dB/oct Butterworth
12dB/oct Linkwitz-Riley	24dB/oct Bessel	48dB/oct Bessel
	24dB/oct Linkwitz-Riley	48dB/oct Linkwitz-Riley

### EQ

The EQ page features 3-band parametric EQ for the low, mid, and high channels.



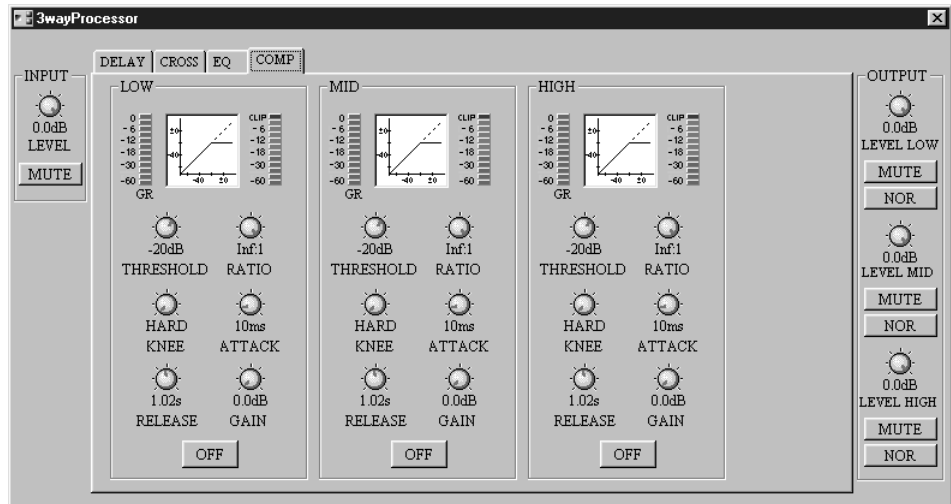
The EQ graph above each set of controls displays the EQ settings graphically.

The EQ parameters for all channels are explained in the following table.

Section	Parameter	Range	Description
LOW, MID, HIGH	Q	10.0–0.1	Adjusts the selectivity of each band
	F	20.0 Hz–20.0 kHz	Adjusts the frequency of each band
	G	–18 dB to +18 dB	Adjusts the gain of each band
	ON/OFF	ON/OFF	Turns each EQ channel on and off

## Comp

The COMP page features compressors for the low, mid, and high channels, with gain reduction (GR) meters, compressor curves, and output level meters.



The gain reduction (GR) meters display the amount of gain reduction being applied by the Compressors. The compressor curves display the effect of the Compressors. The output meters display the level of the output signals.

The compressor parameters for all channels are explained in the following table.

Parameter	Range	Description
THRESHOLD	-54 dB to 0 dB	Adjusts the threshold level
RATIO	1:1 to Infinity:1	Adjusts the compression ratio
KNEE	HARD, 1, 2, 3, 4, 5	Adjusts the Compressor's "hardness"
ATTACK	0 ms–120 ms	Adjusts the attack time
RELEASE	1	Adjusts the release time
GAIN	0.0 dB to +18.0 dB	Adjusts the output gain
ON/OFF	ON/OFF	Turns the Compressor on and off

1. 5 ms–42.3 sec ( $f_s = 48$  kHz), 6 ms–46.0 sec ( $f_s = 44.1$  kHz)

See page 128 for more general information on compressor parameters.

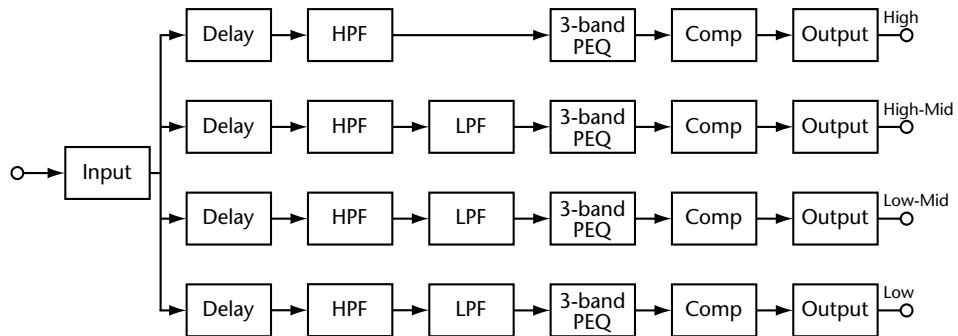
## 4-Way Processor

The 4-Way Processor component splits the input signal into four frequency channels—high, high-mid, low-mid, and low—with delay, 3-band PEQ, and compressor on each channel.

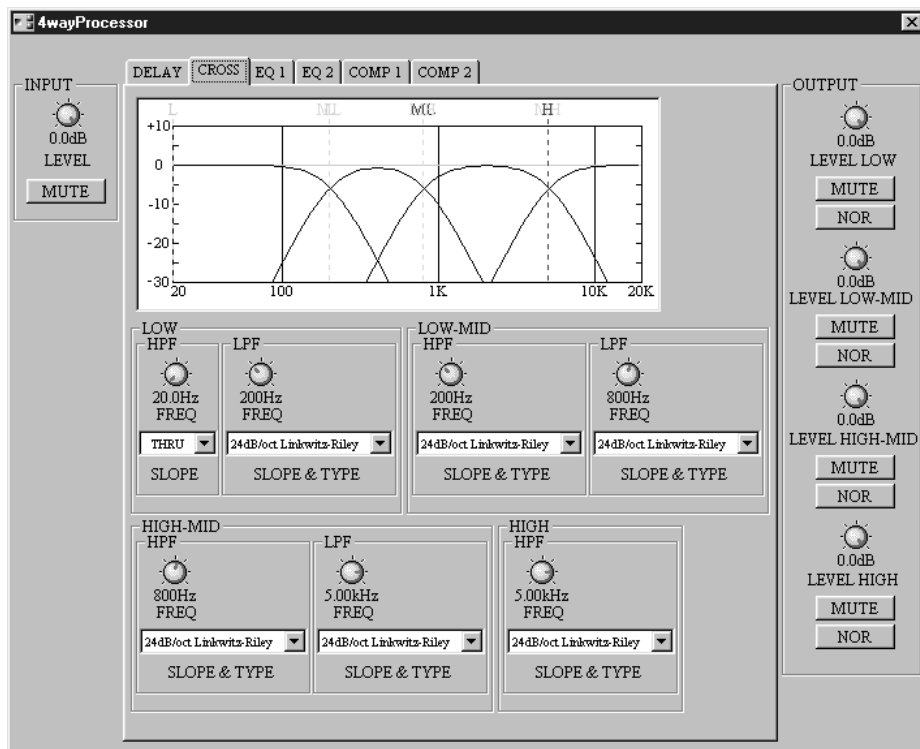


The 4-Way Processor component features one input and four outputs: High, High-Mid, Low-Mid, and Low.

The following block diagram offers an overview of the 4-Way Processor.



The 4-Way Processor control window features INPUT, OUTPUT, and control sections, with DELAY, CROSS, EQ 1, EQ 2, COMP 1, and COMP 2 pages selected by clicking the tabs along the top of the control window, as shown below.

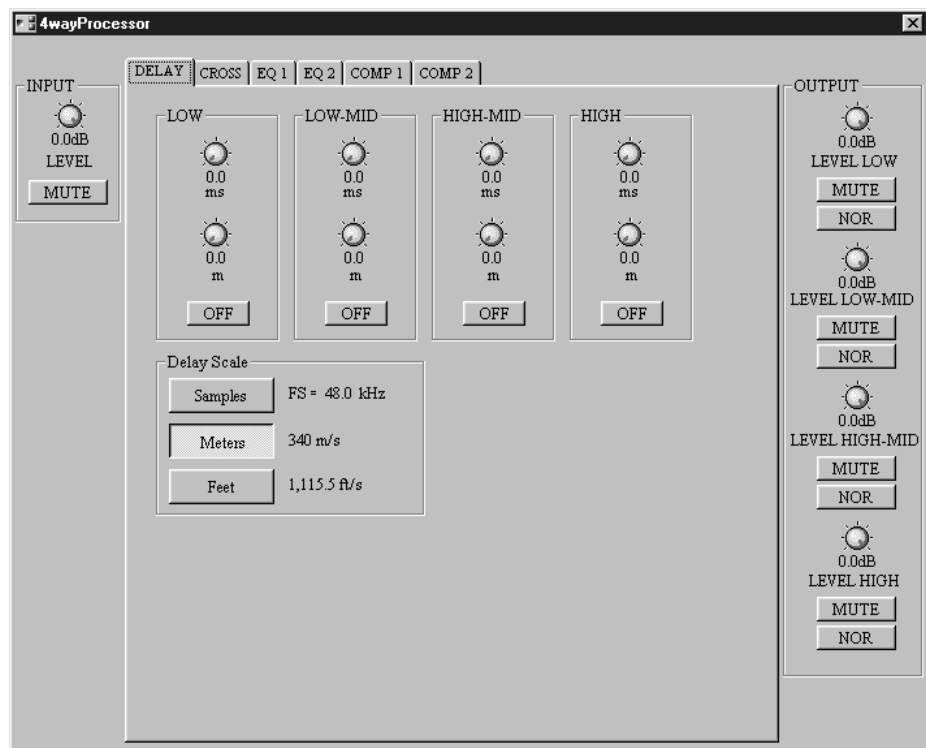


The INPUT and OUTPUT sections of the control window are displayed regardless of which tab is clicked, and their parameters are explained in the following table.

Section	Parameter	Range	Description
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	MUTE	ON/OFF	Mutes the input
OUTPUT LOW	LEVEL	–Infinity dB to 0.0 dB	Adjusts the low output signal level
	MUTE	ON/OFF	Mutes the low output
	PHASE	NOR/REV	Inverts the low output signal
OUTPUT LOW-MID	LEVEL	–Infinity dB to 0.0 dB	Adjusts the low-mid output signal level
	MUTE	ON/OFF	Mutes the low-mid output
	PHASE	NOR/REV	Inverts the low-mid output signal
OUTPUT HIGH-MID	LEVEL	–Infinity dB to 0.0 dB	Adjusts the high-mid output signal level
	MUTE	ON/OFF	Mutes the high-mid output
	PHASE	NOR/REV	Inverts the high-mid output signal
OUTPUT HIGH	LEVEL	–Infinity dB to 0.0 dB	Adjusts the high output signal level
	MUTE	ON/OFF	Mutes the high output
	PHASE	NOR/REV	Inverts the high output signal

## Delay

The DELAY page features individual delays for the low, low-mid, high-mid, and high channels. Delay times can be specified in milliseconds or samples, meters, or feet.



The Delay parameters for all channels are explained in the following table.

Section	Parameter	Range	Description
LOW, LOW-MID, HIGH-MID, HIGH	ms	0.0–500.0 ms	Sets the delay time in milliseconds (linked to control below)
	Sample <sup>1</sup>	See the following table	Sets the delay time in the units chosen using the DELAY SCALE buttons (linked to ms control)
	ON/OFF	ON/OFF	Turns the delay on and off
DELAY SCALE		See the following table	Selects the delay units for the Sample controls

1. This control’s label depends on the Delay Scale setting.

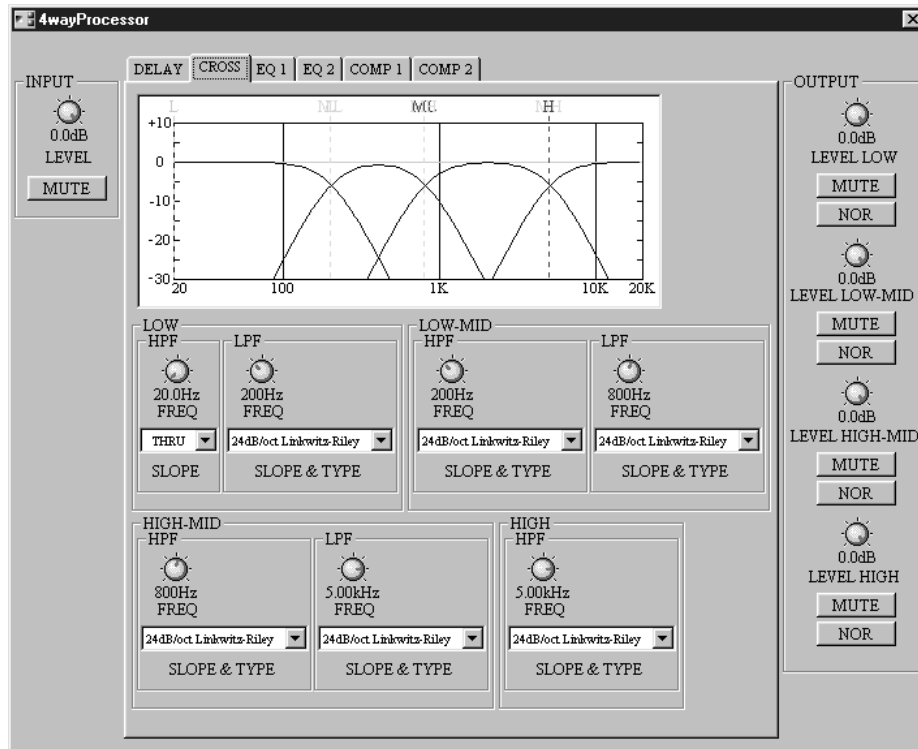
In the DELAY SCALE section, “FS” indicates the selected wordclock frequency, and “340 m/s” and “1,115.5 ft/s” are the speed of sound in meters and feet respectively (air temperature = 14°C, 57.2°F).

The parameter ranges for the Sample, m, and feet settings are as follows:

Delay Scale	FS = 48 KHz	FS = 44.1 kHz
Samples	0–24000 samples	0–22050 samples
Meters	0.0–170.0 meters	
Feet	0.0–557.8 feet	

### Cross

The CROSS page features the 4-way crossover controls and crossover graph.



Note that the Gc controls (not shown here) appear only when an Adjustable Gc type SLOPE & TYPE filter is selected.

The crossover graph at the top of the window displays the crossover settings graphically. A vertical dotted line indicates the crossover frequency of each channel: “L” for low, “ML” for low-mid, “MH” for high-mid, and “H” for high.



The crossover parameters are explained in the following table.

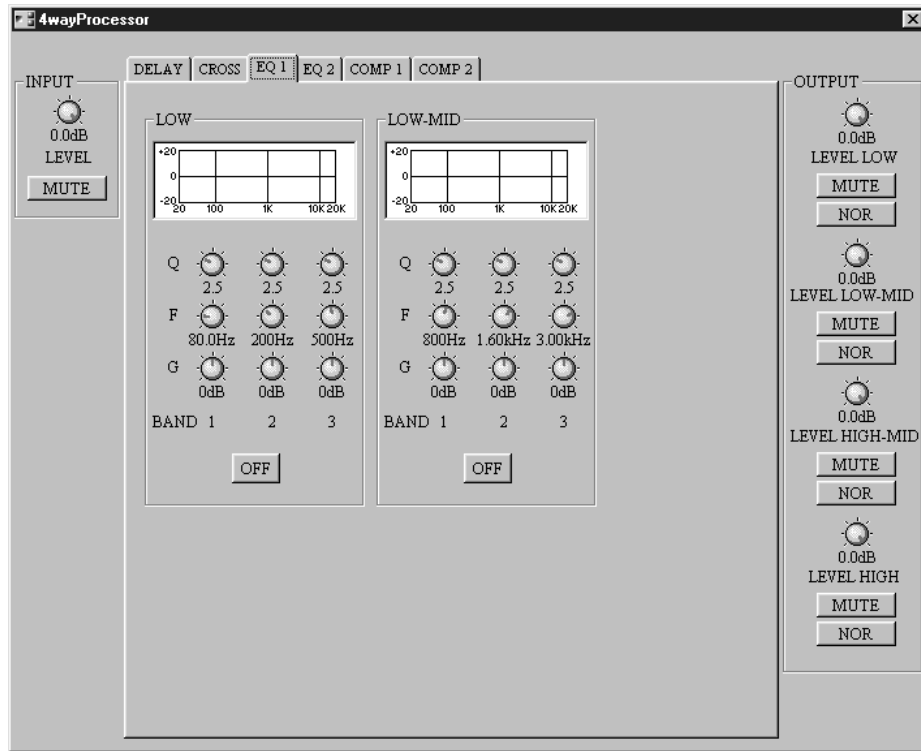
Section	Parameter	Range	Description	
LOW	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the low HPF cutoff frequency
		SLOPE	1	Selects the low HPF filter slope
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the low LPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the low LPF gain at the cutoff frequency
LOW-MID	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the low-mid HPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the low-mid HPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the low-mid HPF filter slope and type
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the low-mid LPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the low-mid LPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the low-mid LPF filter slope and type
HIGH-MID	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the high-mid HPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the high-mid HPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the high-mid HPF filter slope and type
	LPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the high-mid LPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the high-mid LPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the high-mid LPF filter slope and type
HIGH	HPF	FREQ	20.0 Hz–20.0 kHz	Adjusts the high HPF cutoff frequency
		Gc <sup>2</sup>	–6 dB to +6 dB	Adjusts the high HPF gain at the cutoff frequency
		SLOPE & TYPE	3	Selects the high HPF filter slope and type

1. THRU (filter off), 6dB/oct, 12dB/oct, 18dB/oct, 24dB/oct (Butterworth).
2. Gc controls appears only when a Gc SLOPE & TYPE filter is selected. For Butterworth, Bessel, and Linkwitz-Riley, the Gc setting is ignored and the Gc value is fixed as follows: Butterworth and Bessel: –3 dB, Linkwitz-Riley: –6 dB.
3. SLOPE & TYPE parameter values are as follows:

THRU (filter off)	18dB/oct Adjustable Gc
6dB/oct	18dB/oct Butterworth
	18dB/oct Bessel
12dB/oct Adjustable Gc	
12dB/oct Butterworth	24dB/oct Adjustable Gc
12dB/oct Bessel	24dB/oct Butterworth
12dB/oct Linkwitz-Riley	24dB/oct Bessel
	24dB/oct Linkwitz-Riley

**EQ 1**

The EQ 1 page features 3-band parametric EQ for the low and low-mid channels.



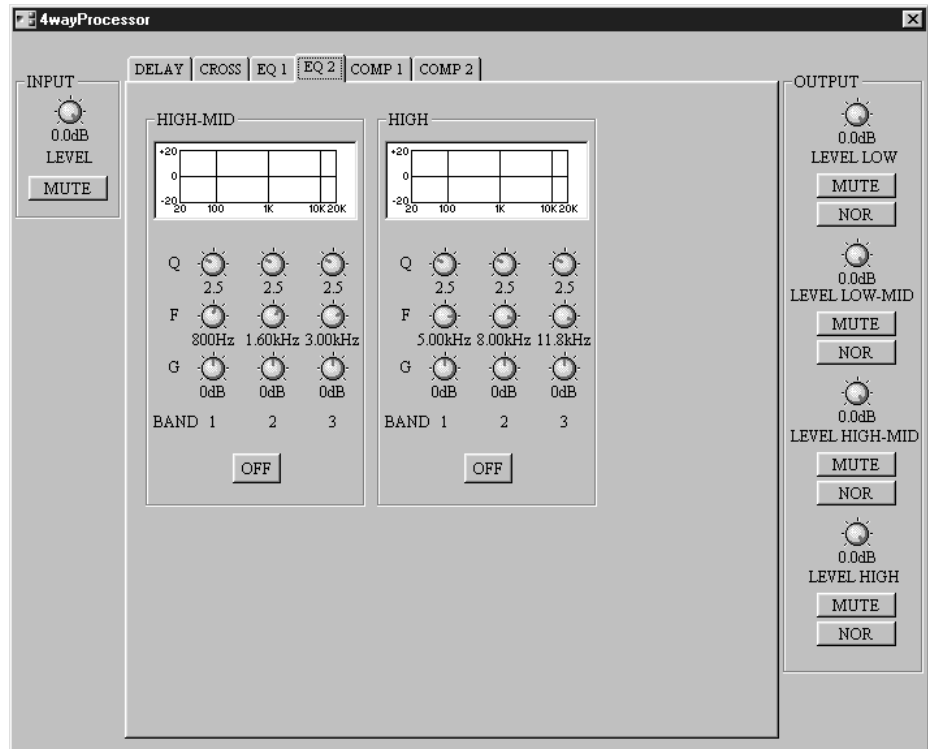
The EQ graph above each set of controls displays the EQ settings graphically.

The EQ parameters for all channels are explained in the following table.

Section	Parameter	Range	Description
LOW, LOW-MID	Q	10.0–0.1	Adjusts the selectivity of each band
	F	20.0 Hz–20.0 kHz	Adjusts the frequency of each band
	G	–18 dB to +18 dB	Adjusts the gain of each band
	ON/OFF	ON/OFF	Turns each EQ channel on and off

## EQ 2

The EQ 2 page features 3-band parametric EQ for the high-mid and high channels.



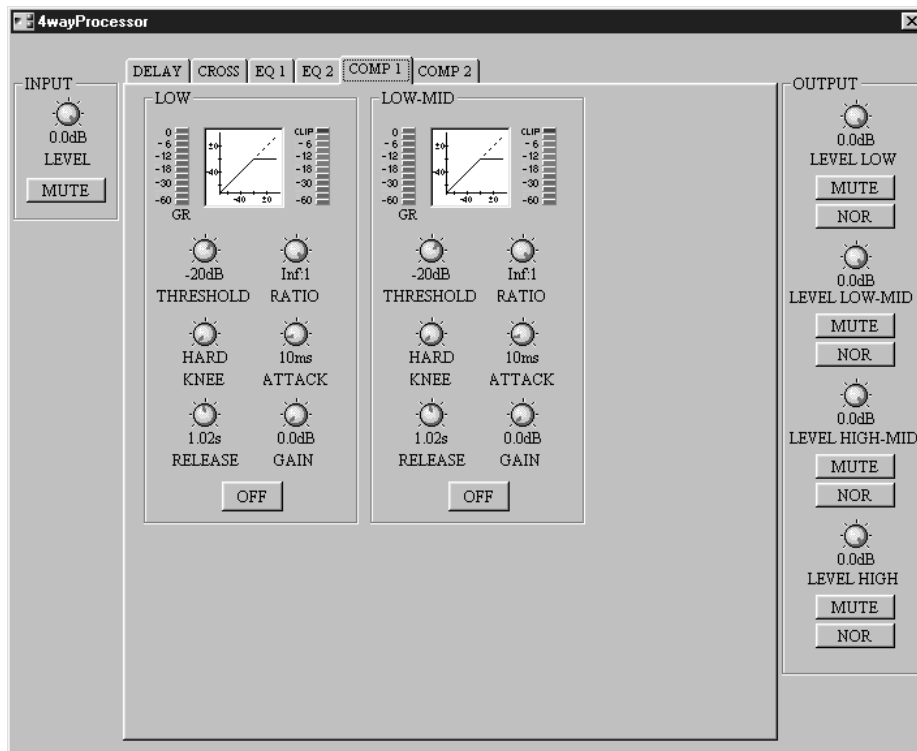
The EQ graph above each set of controls displays the EQ settings graphically.

The EQ parameters for all channels are explained in the following table.

Section	Parameter	Range	Description
HIGH-MID, HIGH	Q	10.0–0.1	Adjusts the selectivity of each band
	F	20.0 Hz–20.0 kHz	Adjusts the frequency of each band
	G	–18 dB to +18 dB	Adjusts the gain of each band
	ON/OFF	ON/OFF	Turns each EQ channel on and off

### Comp 1

The COMP 1 page features compressors for the low and low-mid channels, with gain reduction (GR) meters, compressor curves, and output level meters.



The gain reduction (GR) meters display the amount of gain reduction being applied by the Compressors. The compressor curves display the effect of the Compressors. The output meters display the level of the output signals.

The compressor parameters for all channels are explained in the following table.

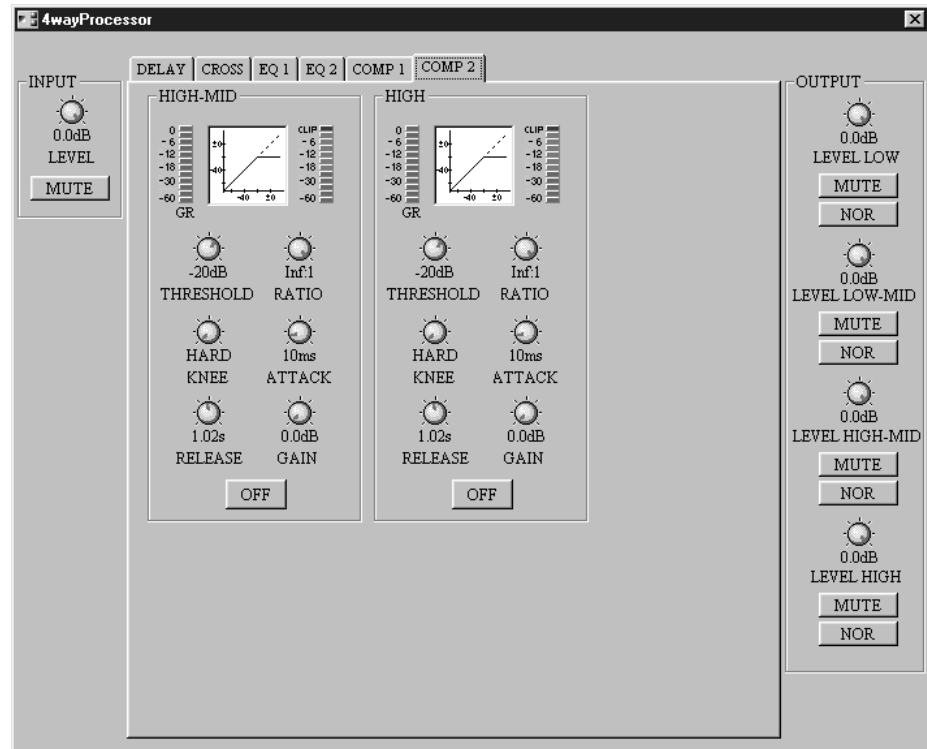
Parameter	Range	Description
<b>THRESHOLD</b>	-54 dB to 0 dB	Adjusts the threshold level
<b>RATIO</b>	1:1 to Infinity:1	Adjusts the compression ratio
<b>KNEE</b>	HARD, 1, 2, 3, 4, 5	Adjusts the Compressor's "hardness"
<b>ATTACK</b>	0 ms–120 ms	Adjusts the attack time
<b>RELEASE</b>	1	Adjusts the release time
<b>GAIN</b>	0.0 dB to +18.0 dB	Adjusts the output gain
<b>ON/OFF</b>	ON/OFF	Turns the Compressor on and off

1. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

See page 128 for more general information on compressor parameters.

## Comp 2

The COMP 2 page features compressors for the high-mid and high channels, with gain reduction (GR) meters, compressor curves, and output level meters.



The gain reduction (GR) meters display the amount of gain reduction being applied by the Compressors. The compressor curves display the effect of the Compressors. The output meters display the level of the output signals.

The compressor parameters for all channels are explained in the following table.

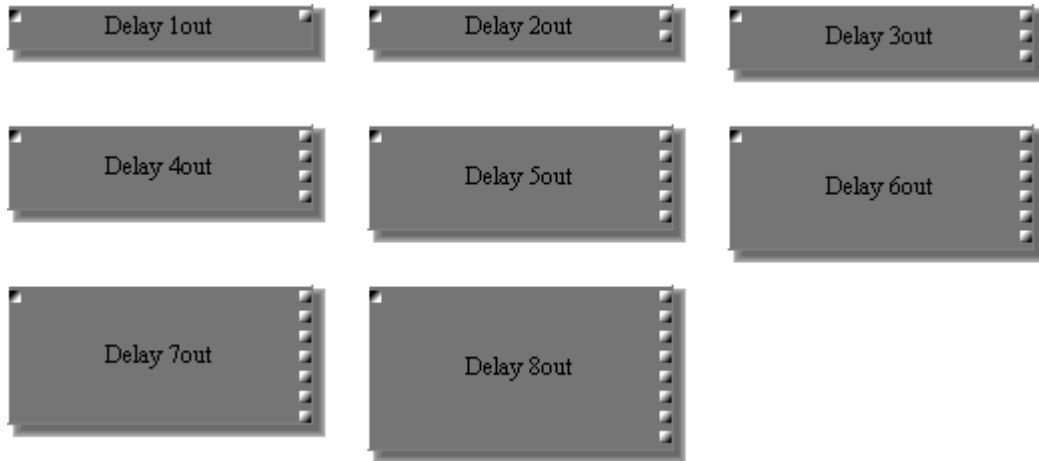
Parameter	Range	Description
THRESHOLD	-54 dB to 0 dB	Adjusts the threshold level
RATIO	1:1 to Infinity:1	Adjusts the compression ratio
KNEE	HARD, 1, 2, 3, 4, 5	Adjusts the Compressor's "hardness"
ATTACK	0 ms–120 ms	Adjusts the attack time
RELEASE	1	Adjusts the release time
GAIN	0.0 dB to +18.0 dB	Adjusts the output gain
ON/OFF	ON/OFF	Turns the Compressor on and off

1. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

See page 128 for more general information on compressor parameters.

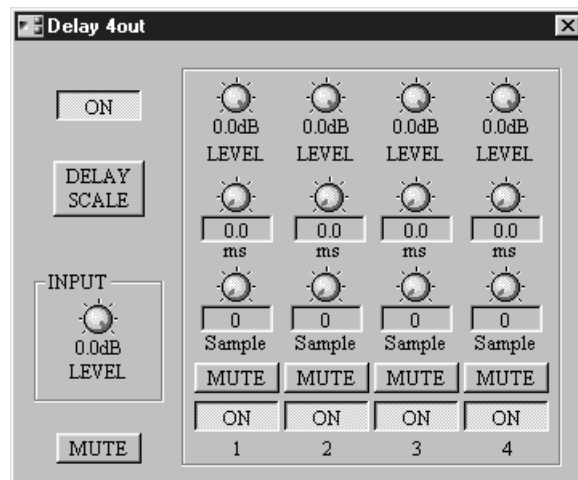
## Delay

There are eight components in the Delay group, each with one input and from one to eight outputs. These are multi-tap delays, with independent delay and level controls for each output. Delay times can be specified in milliseconds and other units, including, samples, meters, feet, timecode frames, or beats per minute.



Since the only difference between all the Delay components is the number of outputs, only the Delay 4 Out control window is shown here.

Each Delay control window features a DELAY SCALE button, INPUT section, and delay control section.



The DELAY SCALE button opens the Delay Scale window, which is used to select the delay time units. See “Setting the Delay Scale” on page 121 for more information.

In addition to dragging the delay time controls, delay times can be specified using the computer keyboard. Simply select the value below a control using the mouse, enter a value from the keyboard, and then press the Enter key. The new value is set and the rotary controls move to their new positions.

Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	MUTE	ON/OFF	Mutes the input

Section	Parameter	Range	Description
Delay	LEVEL	–Infinity dB to 0.0 dB	Adjusts the signal level of each output
	ms	0.0–1200.0 ms	Sets the delay time in milliseconds (linked to control below)
	Sample <sup>1</sup>	See “Setting the Delay Scale” below	Sets the delay time in the units chosen on the Delay Scale window (linked to ms control)
	MUTE	ON/OFF	Mutes each output
	ON/OFF	ON/OFF	Turns each delay on and off

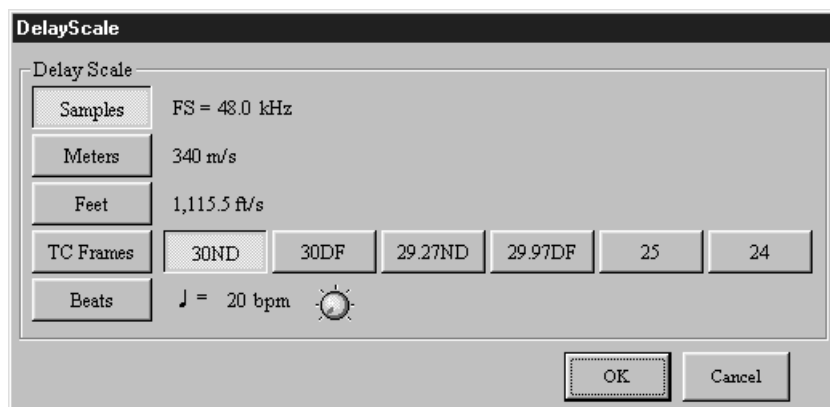
1. This control’s label depends on the Delay Scale setting.

## Setting the Delay Scale

In addition to milliseconds, delay times can also be specified in samples, meters, feet, timecode frames, or beats per minute.

- 1 Click the DELAY SCALE button on a Delay control window.

The Delay Scale window shown below appears.



“FS” indicates the selected wordclock frequency. “340 m/s” and “1,115.5 ft/s” are the speed of sound in meters and feet respectively (air temperature = 14°C, 57.2°F).

- 2 Select the desired units.

Units		FS = 48 KHz	FS = 44.1 kHz
Samples		0.0–57600 samples	0.0–52920 samples
Meters		0.0–408.0 meters	
Feet		0.0–1338.6 feet	
TC Frames	30ND, 30DF, 29.27ND, 29.97DF	0.0–35.96 frames	
	25	0.0–30.0 frames	
	24	0.0–28.8 frames	
Beats (20–300 bpm)	20 bpm	0.000–4.000	
	300 bpm	0.000–60.00	

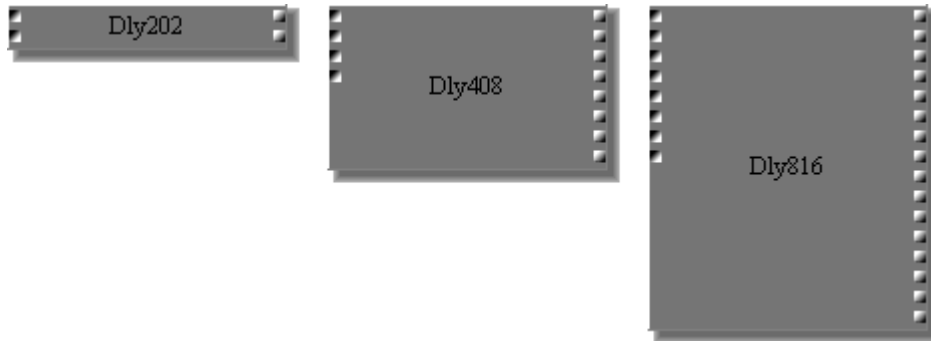
For TC Frames, you must also select a frame rate: 30ND, 30DF, 29.27ND, 29.97DF, 25, or 24. For Beats, you must also set a tempo: 20 to 300.

- 3 Click OK to save your settings, or click Cancel to leave them unchanged.

## Delayed Mixer

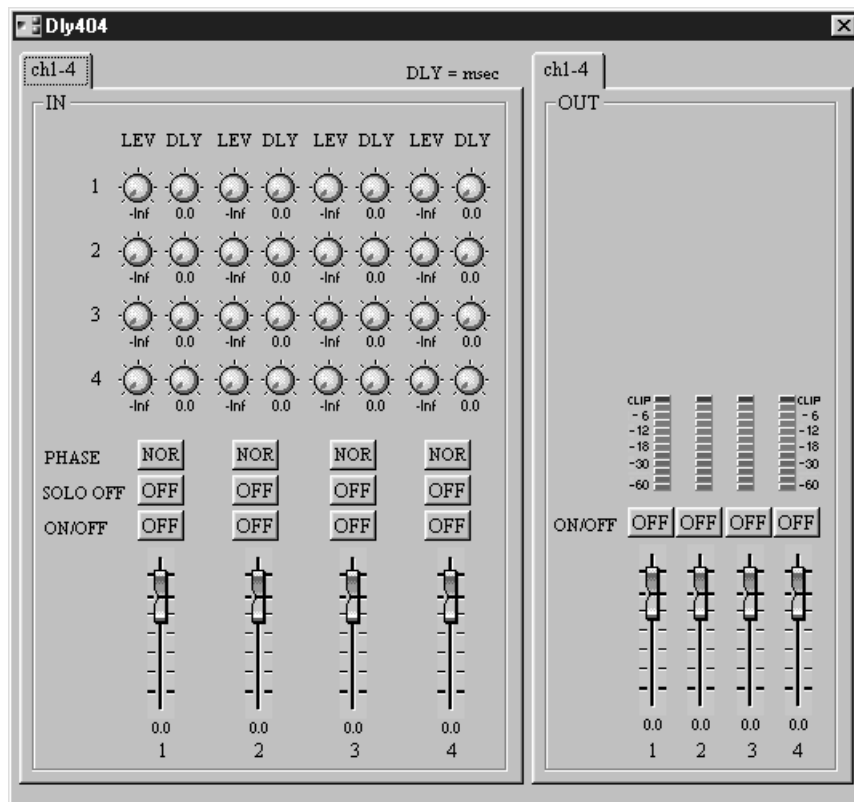
The 15 Delayed Mixer components are organized by number of inputs into three groups: 2x, 4x, and 8x. Delayed Mixers are matrix mixers with a variable delay on each bus send.

A Delayed Matrix Mixer component from each group is shown below.



Since the only difference between all the Delayed Mixer components is the number of inputs and outputs, only the Delayed Mixer 4x4 control window is shown here.

Each Delayed Mixer control window features an IN section, with various input channel controls, and an OUT section, with fader and meter for each output channel.



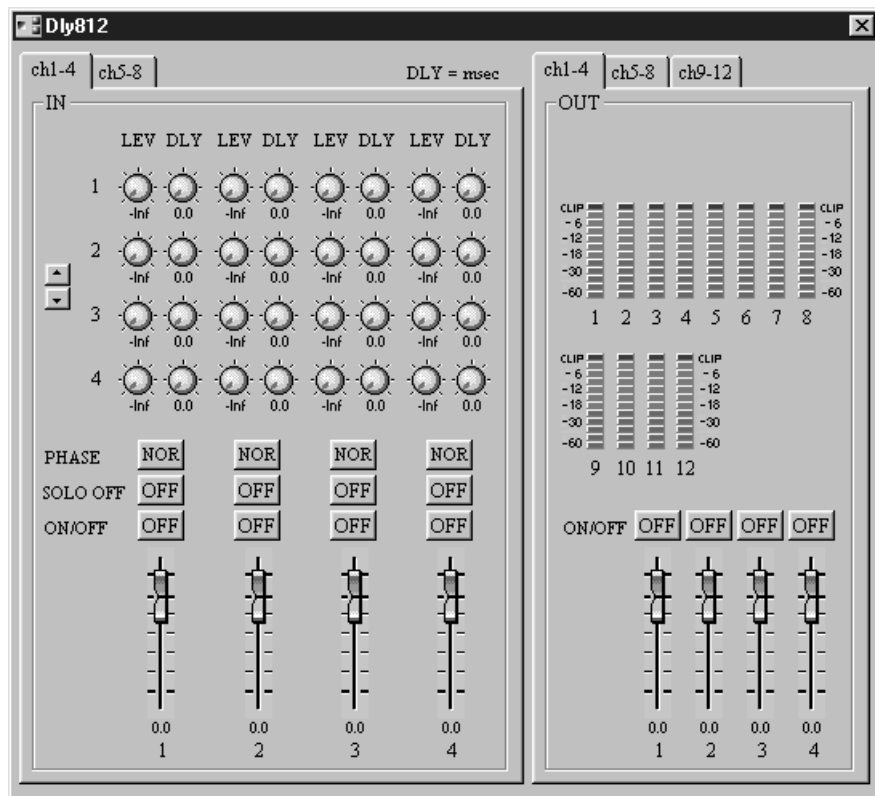
When a channel is soloed, "SOLO OFF" changes to "SOLO ON." This is especially convenient on control windows where the input channels are organized into pages and it's not possible to see all SOLO buttons simultaneously.



The OUT meters display the level of each output signal.

Section	Parameter	Range	Description
IN	LEV (bus level)	–Infinity dB to 0.0 dB	Adjusts the level of each input channel signal that is fed to each output channel
	DLY (delay)	0.0–500.0 ms	Adjusts the delay time of each input channel that is fed to each output channel
	PHASE	NOR/REV	Inverts each input channel signal
	SOLO	ON/OFF	Solos each input channel
	ON/OFF	ON/OFF	Mutes each input channel
	Fader	–Infinity dB to 6.0 dB	Adjusts the level of each input channel
OUT	ON/OFF	ON/OFF	Mutes each output channel
	Fader	–Infinity dB to 6.0 dB	Adjusts the level of each output channel

For Delayed Mixer components with more than four inputs (4x), input channels are arranged into pages consisting of four channels. Likewise, output channels are arranged into pages consisting of four channels. Pages are selected by clicking the tabs along the top of the control window, as shown on the 16x12 Delayed Mixer below.



For components with more than four outputs (i.e., more than four bus level controls per input channel), the bus level controls in the IN section can be scrolled up or down by clicking these two arrow buttons.

The following Delayed Mixers are available.

<b>Group</b>	<b>Delayed Mixer</b>	<b>Inputs</b>	<b>Outputs</b>
<b>2x</b>	<b>2x2</b>	<b>2</b>	<b>2</b>
	<b>2x4</b>		<b>4</b>
	<b>2x8</b>		<b>8</b>
	<b>2x12</b>		<b>12</b>
	<b>2x16</b>		<b>16</b>
<b>4x</b>	<b>4x2</b>	<b>4</b>	<b>2</b>
	<b>4x4</b>		<b>4</b>
	<b>4x8</b>		<b>8</b>
	<b>4x12</b>		<b>12</b>
	<b>4x16</b>		<b>16</b>
<b>8x</b>	<b>8x2</b>	<b>8</b>	<b>2</b>
	<b>8x4</b>		<b>4</b>
	<b>8x8</b>		<b>8</b>
	<b>8x12</b>		<b>12</b>
	<b>8x16</b>		<b>16</b>

## Dynamics

There are 12 components in the Dynamics group: Compander, Compressor, De-Esser, Ducker, Expander, Gate, Stereo Compander, Stereo Compressor, Stereo Ducker, Stereo De-Esser, Stereo Expander, and Stereo Gate.

### Compander & Stereo Compander

A compander comprises compressor and expander, with the compressor “squeezing” signals above a specified threshold and the expander “stretching” signals below that threshold. Two compander components are available: a single-channel Compander and a Stereo Compander. They can be self-triggering or externally triggered via the sidechain input.

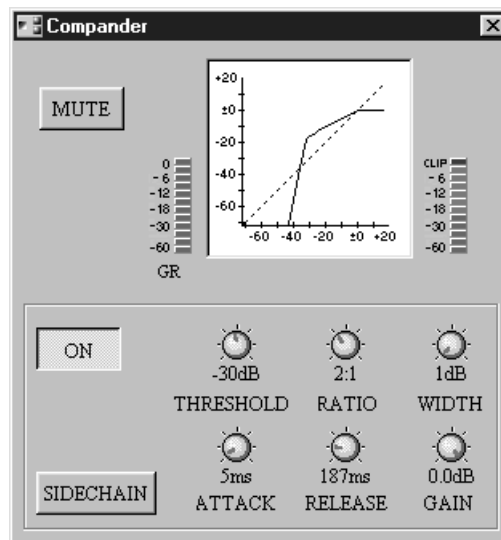


The Compander component features one input, one output, and a sidechain input.

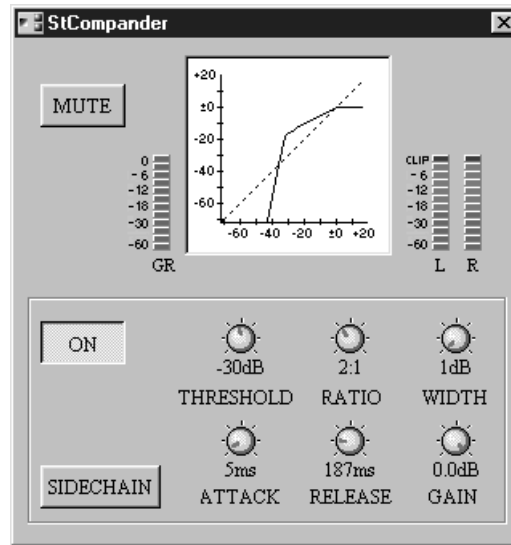


The Stereo Compander component features two inputs, two outputs, and a sidechain input.

The Compander control window features a gain reduction (GR) meter, compander curve, output level meter, and compander controls.



The Stereo Compander control window features a gain reduction (GR) meter, compander curve, output level meters, and compander controls.



The gain reduction (GR) meter displays the amount of gain reduction being applied by the Compander. The compander curve displays the effect of the Compander. The vertical axis corresponds to the output signal level, while the horizontal axis corresponds to the input signal level. A 45-degree line means that the input signal level equals the output signal level, in other words, the Compander is having no effect. The output meter displays the level of the output signal.

Parameter	Range	Description
MUTE	ON/OFF	Mutes the output
ON/OFF	ON/OFF	Turns the component on and off
SIDECHAIN	ON/OFF	Selects the sidechain input as the trigger source
THRESHOLD	-54 dB to 0 dB	Adjusts the threshold level
RATIO	1:1 to 20:1	Adjusts the compression ratio
WIDTH	1 dB to 90 dB	Adjusts the expander width
ATTACK	0 ms–120 ms	Adjusts the attack time
RELEASE	1	Adjusts the release time
GAIN	-18 dB to 0.0 dB	Adjusts the output gain

1. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

**SIDECHAIN**—When SIDECHAIN is off, the Compander is triggered by the input signal. On the Stereo Compander, the trigger signal is derived by mixing the signals from both inputs, so the higher of the two input signals will activate the Compander. When SIDECHAIN is on, the Compander is triggered by the signal connected to the sidechain input.

**THRESHOLD**—This determines the level of the trigger signal at which compression and expansion are applied. Trigger signals at a level below the sum of the threshold and width cause the expander to attenuate the input signal. Trigger signals above the threshold cause the compressor to compress the input signal by the amount specified using the Ratio parameter.

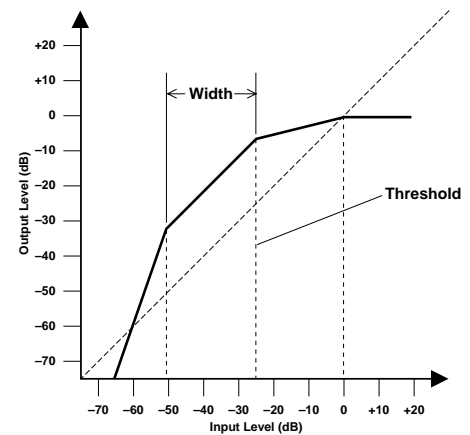
**RATIO**—This determines the amount of compression. That is, the change in output signal level relative to the change in trigger signal level. For a 2:1 ratio, for example, a 10 dB change in trigger level (above the threshold) results in a 5 dB change in output level. For a 5:1 ratio, a 10 dB change in trigger level (above the threshold) results in a

2 dB change in output level. Compression ratios above 10:1 limit signals rather than compress them.

The expansion ratio is fixed at 5:1, so a 2 dB change in trigger level (below the threshold) results in a 10 dB change in output level.

**WIDTH**—This determines how far below the threshold level expansion is applied. The expander is essentially turned off when the width is set to 90 dB.

**ATTACK**—This determines how soon the signal is compressed and expanded once the Componder has been activated. With a fast attack time, the signal is compressed almost immediately. With a slow attack time, however, the initial transient of a sound passes through unaffected. Attack times from 1 to 5 milliseconds are a good place to start.



**RELEASE**—This determines how soon the compressor and expander return to their normal gains once the trigger signal level drops below the threshold. If the release time is too short, the gain will recover too quickly causing level pumping (i.e., noticeable gain fluctuations). If it is set too long, the compressor may not have time to recover before the next high level signal appears, and it will be compressed incorrectly. Release times from 0.1 to 0.5 seconds are a good place to start.

**GAIN**—This sets the Componder's output signal level. It can be used to compensate for the overall level change caused by the compression and expansion processes.

## Compressor & Stereo Compressor

A compressor essentially “squeezes” a signal’s dynamic range, making it easier to mix and record signals with a wide dynamic range, such as vocals and piano. Two compressor components are available: a single-channel Compressor and a Stereo Compressor. They can be self-triggering or externally triggered via the sidechain input.

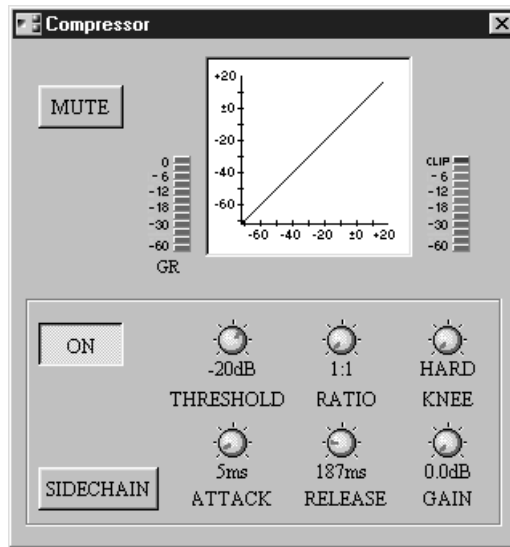


The Compressor component features one input, one output, and a sidechain input.

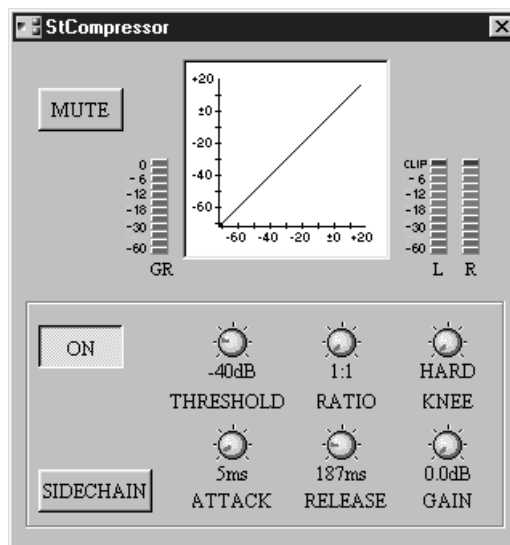


The Stereo Compressor component features two inputs, two outputs, and a sidechain input.

The Compressor control window features a gain reduction (GR) meter, compressor curve, output level meter, and compressor controls.



The Stereo Compressor control window features a gain reduction (GR) meter, compressor curve, output level meters, and compressor controls.



The gain reduction (GR) meter displays the amount of gain reduction being applied by the Compressor. The compressor curve displays the effect of the Compressor. The vertical axis corresponds to the output signal level, while the horizontal axis corresponds

to the input signal level. A 45-degree line means that the input signal level equals the output signal level, in other words, the Compressor is having no effect. The output meter displays the level of the output signal.

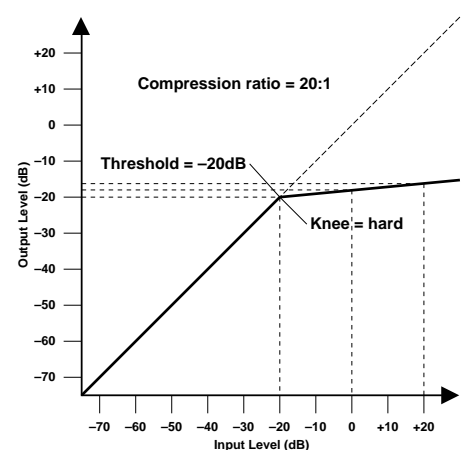
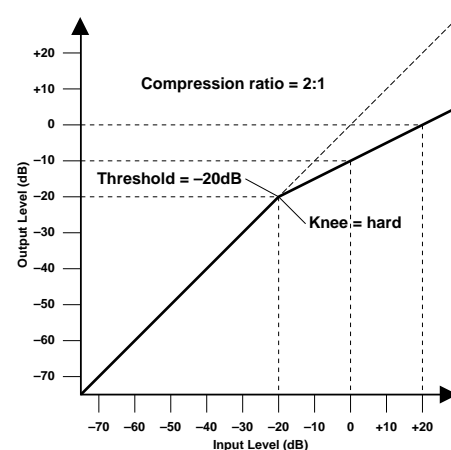
Parameter	Range	Description
MUTE	ON/OFF	Mutes the output
ON/OFF	ON/OFF	Turns the component on and off
SIDECHAIN	ON/OFF	Selects the sidechain input as the trigger source
THRESHOLD	-54 dB to 0 dB	Adjusts the threshold level
RATIO	1:1 to Infinity:1	Adjusts the compression ratio
KNEE	HARD, 1, 2, 3, 4, 5	Adjusts the Compressor's "hardness"
ATTACK	0 ms-120 ms	Adjusts the attack time
RELEASE	1	Adjusts the release time
GAIN	0.0 dB to +18.0 dB	Adjusts the output gain

1. 5 ms-42.3 sec (fs = 48 kHz), 6 ms-46.0 sec (fs = 44.1 kHz)

**SIDECHAIN**—When SIDECHAIN is off, the Compressor is triggered by the input signal. On the Stereo Compressor, the trigger signal is derived by mixing the signals from both inputs, so the higher of the two input signals will activate the Compressor. When SIDECHAIN is on, the Compressor is triggered by the signal connected to the sidechain input.

**THRESHOLD**—This determines the level of trigger signal required to activate the Compressor. Trigger signals at a level below the threshold cause the Compressor to pass the input signal through unaffected. Trigger signals above the threshold level cause the Compressor to compress the input signal by the amount specified using the Ratio parameter.

**RATIO**—This determines the amount of compression. That is, the change in output signal level relative to the change in trigger signal level. For a 2:1 ratio, for example, a 10 dB change in trigger level (above the threshold) results in a 5 dB change in output level. For a 5:1 ratio, a 10 dB change in trigger level (above the threshold) results in a 2 dB change in output level. Compression ratios above 10:1 limit signals rather than compress them.



**KNEE**—This determines how compression is applied at the threshold point. When set to hard, compression at the specified ratio is applied as soon as the trigger signal level exceeds the specified threshold. For knee settings from 1 to 5 (5 being the softest), how-

ever, compression is applied gradually as the trigger signal exceeds the specified threshold, creating a more natural sound. This is known as soft-knee compression.

**ATTACK**—This determines how soon the signal is compressed once the Compressor has been activated. With a fast attack time, the signal is compressed almost immediately. With a slow attack time, however, the initial transient of a sound passes through unaffected. Attack times from 1 to 5 milliseconds are a good place to start.

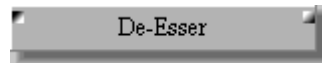
**RELEASE**—This determines how soon the Compressor returns to its normal gain once the trigger signal level drops below the threshold. If the release time is too short, the gain will recover too quickly causing level pumping (i.e., noticeable gain fluctuations). If it is set too long, the Compressor may not have time to recover before the next high level signal appears and it will be compressed incorrectly. Release times from 0.1 to 0.5 seconds are a good place to start.

**GAIN**—This sets the Compressor's output signal level, and can be used to compensate for the overall level change caused by the compression process.



## De-Esser & Stereo De-Esser

A de-esser is essentially a compressor that “squeezes” signals above a specified frequency, and is typically used to reduce sibilant speech sounds such as “s” and “sh.” Two de-esser components are available: a single-channel De-esser and a Stereo De-esser.

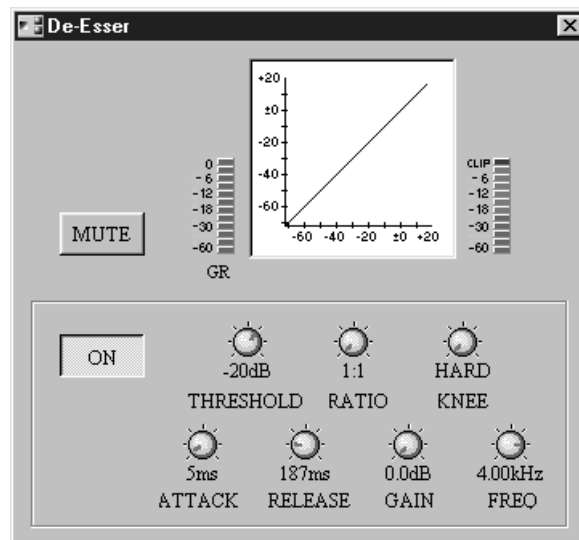


The De-Esser component features one input and one output.

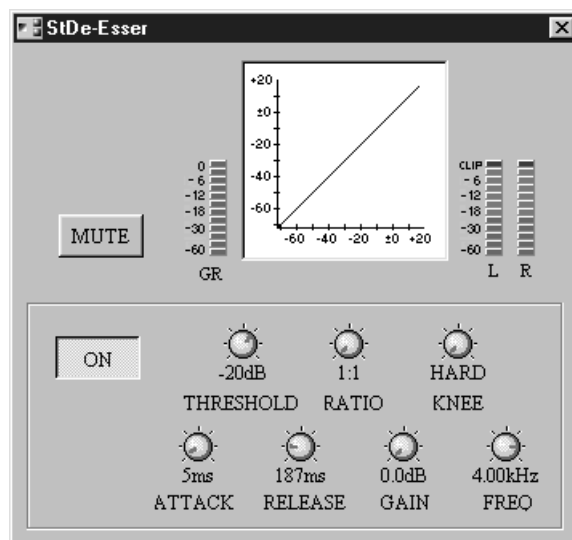


The Stereo De-Esser component features two inputs and two outputs.

The De-Esser control window features a gain reduction (GR) meter, de-esser curve, output level meter, and de-esser controls.



The Stereo De-Esser control window features a gain reduction (GR) meter, de-esser curve, output level meters, and de-esser controls.



The gain reduction (GR) meter displays the amount of gain reduction being applied by the De-Esser. The de-esser curve displays the effect of the De-Esser. The vertical axis corresponds to the output signal level, while the horizontal axis corresponds to the input signal level. A 45-degree line means that the input signal level equals the output

signal level, in other words, the De-Esser is having no effect. The output meter displays the level of the output signal.

Parameter	Range	Description
<b>MUTE</b>	ON/OFF	Mutes the output
<b>ON/OFF</b>	ON/OFF	Turns the component on and off
<b>THRESHOLD</b>	-54 dB to 0 dB	Adjusts the threshold level
<b>RATIO</b>	1:1 to Infinity:1	Adjusts the de-esser ratio
<b>KNEE</b>	HARD, 1, 2, 3, 4, 5	Adjusts the De-esser's "hardness"
<b>ATTACK</b>	0 ms–120 ms	Adjusts the attack time
<b>RELEASE</b>	1	Adjusts the release time
<b>GAIN</b>	0.0 dB to +18.0 dB	Adjusts the output gain
<b>FREQ</b>	80.0 Hz to 10.0 kHz	Adjusts the frequency above which signals are compressed

1. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

**THRESHOLD**—This determines the level of input signal required to activate the De-Esser. On the Stereo De-Esser, the trigger signal is derived by mixing the signals from both inputs, so the higher of the two input signals will activate the De-Esser. Signals below the threshold level pass through the De-Esser unaffected. Signals above the threshold level that are above the specified frequency are compressed by the amount specified using the Ratio parameter.

**RATIO**—This determines the amount of compression, that is, the change in output signal level relative to the change in input signal level for signals above the specified frequency. For a 2:1 ratio, for example, a 10 dB change in input level (above the threshold) results in a 5 dB change in output level. For a 5:1 ratio, a 10 dB change in input level (above the threshold) results in a 2 dB change in output level. Compression ratios above 10:1 limit signals rather than compress them.

**KNEE**—This determines how compression is applied at the threshold point. When set to hard, compression at the specified ratio is applied to signals above the specified frequency as soon as the input signal level exceeds the specified threshold. For knee settings from 1 to 5 (5 = softest), however, compression is applied gradually as the signal exceeds the specified threshold, creating a more natural effect.

**ATTACK**—This determines how soon the signal is compressed once the De-Esser has been activated. With a fast attack time, the signal is compressed almost immediately. With a slow attack time, however, the initial transient of a sound passes through unaffected.

**RELEASE**—This determines how soon the De-Esser returns to its normal gain once the trigger signal level drops below the threshold. If the release time is too short, the gain will recover too quickly causing level pumping (i.e., noticeable gain fluctuations). If it is set too long, the compressor may not have time to recover before the next high level signal at the specified frequency appears and it will be compressed incorrectly.

**GAIN**—This sets the De-Esser's output signal level, and can be used to compensate for the level change in signals above the specified frequency caused by the compression process.

**FREQ**—This sets the frequency above which signals are compressed when the De-Esser is activated.

## Ducker & Stereo Ducker

A ducker dynamically adjusts the level of a signal in response to a trigger signal. Two ducker components are available: a single-channel Ducker and a Stereo Ducker. They can be self-triggering or externally triggered via the sidechain input.

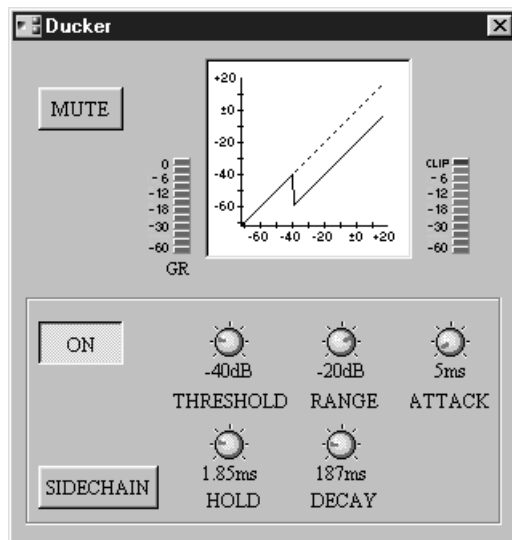


The Ducker component features one input, one output, and a sidechain input.

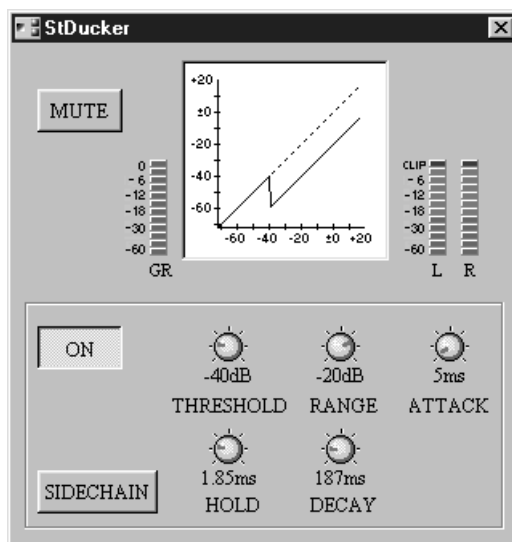


The Stereo Ducker component features two inputs, two outputs, and a sidechain input.

The Ducker control window features a gain reduction (GR) meter, ducker curve, output level meter, and ducker controls.



The Stereo Ducker control window features a gain reduction (GR) meter, ducker curve, output level meters, and ducker controls.



The gain reduction (GR) meter displays the amount of gain reduction being applied by the Ducker. The ducker curve displays the effect of the Ducker. The vertical axis corresponds to the output signal level, while the horizontal axis corresponds to the input signal level. A 45-degree line means that the input signal level equals the output signal

level, in other words, the Ducker is having no effect. The output meter displays the level of the output signal.

Parameter	Range	Description
<b>MUTE</b>	ON/OFF	Mutes the output
<b>ON/OFF</b>	ON/OFF	Turns the component on and off
<b>SIDECHAIN</b>	ON/OFF	Selects the sidechain input as the trigger source
<b>THRESHOLD</b>	-54 dB to 0 dB	Adjusts the threshold level
<b>RANGE</b>	-70 dB to 0 dB	Adjusts the range
<b>ATTACK</b>	0 ms–120 ms	Adjusts the attack time
<b>HOLD</b>	1	Adjusts the hold time
<b>DECAY</b>	2	Adjusts the decay time

1. 0.02 ms–1.96 sec (fs = 48 kHz), 0.02 ms–2.13 sec (fs = 44.1 kHz)
2. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

**SIDECHAIN**—When SIDECHAIN is off, the Ducker is triggered by the input signal. On the Stereo Ducker, the trigger signal is derived by mixing the signals from both inputs, so the higher of the two input signals will activate the Ducker. When SIDECHAIN is on, the Ducker is triggered by the signal connected to the sidechain input.

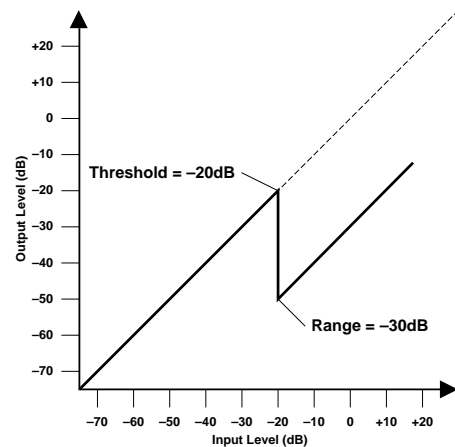
**THRESHOLD**—This determines the level of trigger signal required to activate ducking. Trigger signal levels below the threshold do not activate ducking. Trigger signals at and above the threshold level, however, activate ducking, and the signal level is reduced to a level set by the Range parameter.

**RANGE**—This determines the level to which the signal is ducked. For a setting of -70 dB, the signal is virtually cutoff. For a setting of -30 dB, however, the signal is ducked by 30 dB. For a setting of 0 dB, the Ducker has no effect.

**ATTACK**—This determines how soon the signal is ducked once the Ducker has been activated. With a fast attack time, the signal is ducked almost immediately. With a slow attack time, however, ducking appears to fade in the signal. Too fast an attack time may sound abrupt.

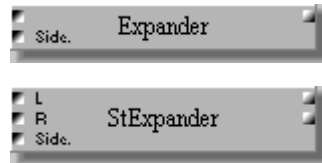
**HOLD**— This determines how long ducking remains active once the trigger signal has fallen below the threshold level.

**DECAY**—This determines how soon the Ducker returns to its normal gain once the trigger signal level drops below the threshold.



## Expander & Stereo Expander

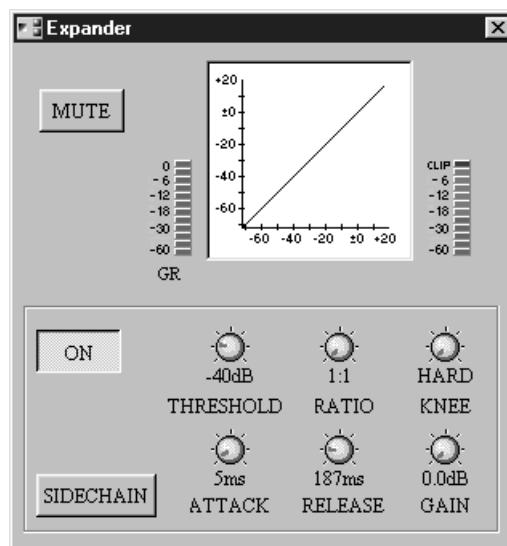
An expander essentially “stretches” a signal’s dynamic range, thereby reducing low-level signals such as noise, effectively increasing the signal-to-noise ratio. Two expander components are available: a single-channel Expander and a Stereo Expander. They can be self-triggering or externally triggered via the sidechain input.



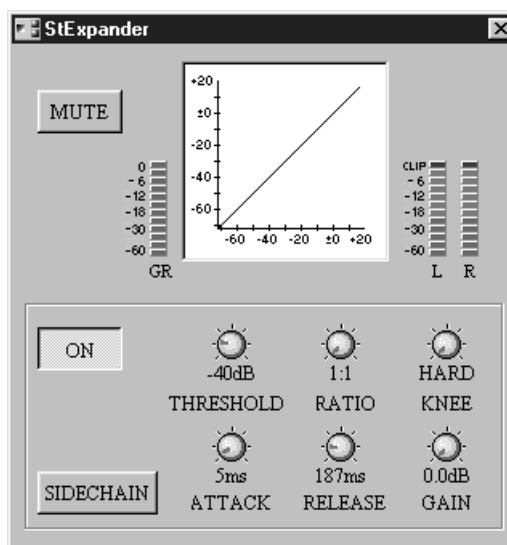
The Expander component features one input, one output, and a sidechain input.

The Stereo Expander component features two inputs, two outputs, and a sidechain input.

The Expander control window features a gain reduction (GR) meter, expander curve, output level meter, and expander controls.



The Stereo Expander control window features a gain reduction (GR) meter, expander curve, output level meters, and expander controls.



The gain reduction (GR) meter displays the amount of gain reduction being applied by the Expander. The expander curve displays the effect of the Expander. The vertical axis corresponds to the output signal level, while the horizontal axis corresponds to the

input signal level. A 45-degree line means that the input signal level equals the output signal level, in other words, the Expander is having no effect. The output meter displays the level of the output signal.

Parameter	Range	Description
MUTE	ON/OFF	Mutes the output
ON/OFF	ON/OFF	Turns the component on and off
SIDECHAIN	ON/OFF	Selects the sidechain input as the trigger source
THRESHOLD	-54 dB to 0 dB	Adjusts the threshold level
RATIO	1:1 to Infinity:1	Adjusts the expander ratio
KNEE	HARD, 1, 2, 3, 4, 5	Adjusts the Expander's "hardness"
ATTACK	0 ms–120 ms	Adjusts the attack time
RELEASE	1	Adjusts the release time
GAIN	0.0 dB to +18.0 dB	Adjusts the output gain

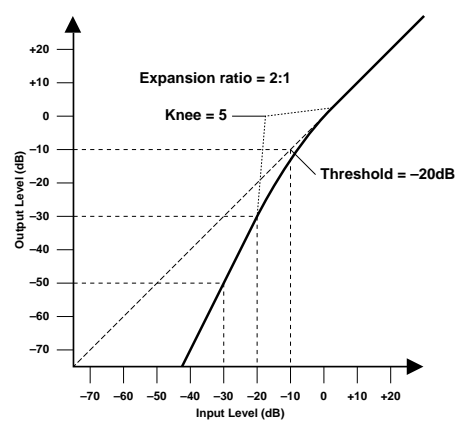
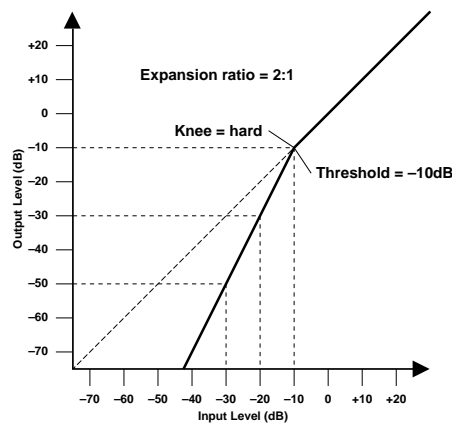
1. 5 ms–42.3 sec (fs = 48 kHz), 6 ms–46.0 sec (fs = 44.1 kHz)

**SIDECHAIN**—When SIDECHAIN is off, the Expander is triggered by the input signal. On the Stereo Expander, the trigger signal is derived by mixing the signals from both inputs, so the higher of the two input signals will activate the Expander. When SIDECHAIN is on, the Expander is triggered by the signal connected to the sidechain input.

**THRESHOLD**—This determines the level of the trigger signal required to activate the Expander. Trigger signals above the threshold cause the Expander to pass the input signal through unaffected. Trigger signals below the threshold level cause the Expander to expand the input signal by the amount specified using the Ratio parameter.

**RATIO**—This determines the amount of expansion. That is, the change in output signal level relative to the change in trigger signal level. For a 2:1 ratio, for example, a 5 dB change in trigger level (below the threshold) results in a 10 dB change in output level. For a 5:1 ratio, a 2 dB change in trigger level (below the threshold) results in a 10 dB change in output level. With a Ratio setting of Infinity:1, the Expander functions just like a gate.

**KNEE**—This determines how expansion is applied at the threshold point. When set to hard, expansion at the specified ratio is applied as soon as the trigger signal level falls below the specified threshold. For knee settings from 1 to 5 (5 being the softest), however, expansion is applied gradually before the trigger falls below the specified threshold, creating a more natural sound.



**ATTACK**—This determines how soon the signal is expanded once the Expander has been activated. With a fast attack time, the signal is expanded almost immediately. With a slow attack time, however, the initial transient of a sound passes through unaffected. Attack times from 1 to 5 milliseconds are a good place to start.

**RELEASE**—This determines how soon the Expander returns to its normal gain once the trigger signal level exceeds the threshold. If the release time is too short, the gain will recover too quickly causing level pumping (i.e., noticeable gain fluctuations). If it is set too long, the Expander may not have time to recover before the next low-level signal appears and it will be expanded incorrectly. Release times from 0.1 to 0.5 seconds are a good place to start.

**GAIN**—This sets the Expander's output signal level, and can be used to compensate for the overall level change caused by the expansion process.

## Gate & Stereo Gate

A gate, or noise gate, is essentially an audio switch for muting signals below a specified threshold. It can be self-triggering or externally triggered via the sidechain input. Two gate components are available: a single-channel Gate and a Stereo Gate. They can be self-triggering or externally triggered via the sidechain input.

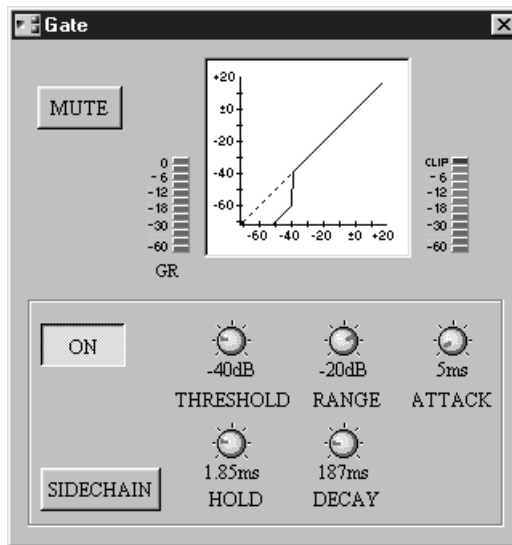


The Gate component features one input, one output, and a sidechain input.

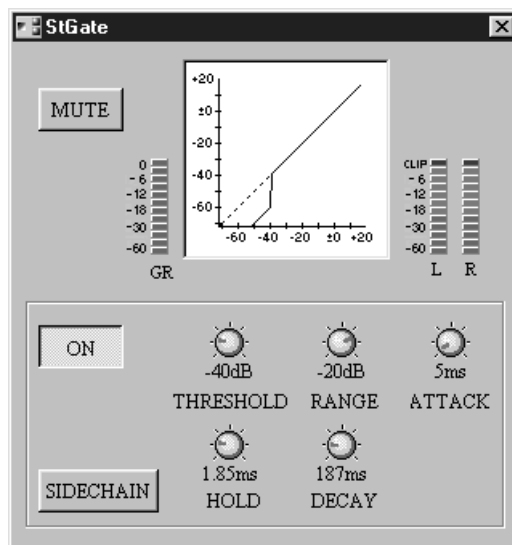


The Stereo Gate component features two inputs, two outputs, and a sidechain input.

The Gate control window features a gain reduction (GR) meter, gate curve, output level meter, and gate controls.



The Stereo Gate control window features a gain reduction (GR) meter, gate curve, output level meters, and gate controls.



The gain reduction (GR) meter displays the amount of gain reduction being applied by the Gate. The gate curve displays the effect of the Gate. The vertical axis corresponds to the output signal level, while the horizontal axis corresponds to the input signal level.



A 45-degree line means that the input signal level equals the output signal level, in other words, the Gate is having no effect. The output meter displays the level of the output signal.

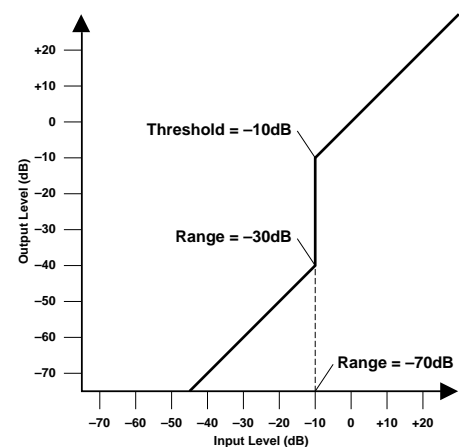
Parameter	Range	Description
MUTE	ON/OFF	Mutes the output
ON/OFF	ON/OFF	Turns the component on and off
SIDECHAIN	ON/OFF	Selects the sidechain input as the trigger source
THRESHOLD	-54 dB to 0 dB	Adjusts the threshold level
RANGE	-70 dB to 0 dB	Adjusts the range
ATTACK	0 ms-120 ms	Adjusts the attack time
HOLD	1	Adjusts the hold time
DECAY	2	Adjusts the decay time

1. 0.02 ms-1.96 sec (fs = 48 kHz), 0.02 ms-2.13 sec (fs = 44.1 kHz)
2. 5 ms-42.3 sec (fs = 48 kHz), 6 ms-46.0 sec (fs = 44.1 kHz)

**SIDECHAIN**—When SIDECHAIN is off, the Gate is triggered by the input signal. On the Stereo Gate, the trigger signal is derived by mixing the signals from both inputs, so the higher of the two input signals will activate the Gate. When SIDECHAIN is on, the Gate is triggered by the signal connected to the sidechain input.

**THRESHOLD**—This determines the level of the trigger signal required to open and close the Gate. Trigger signals above the threshold cause the Gate to open, allowing the input signal to pass unaffected. Trigger signals below the threshold, however, cause the Gate to close, preventing the passage of the input signal.

**RANGE**—This determines the level to which the Gate closes. Think of it as a brick holding a garden gate open so that a certain amount of signal always flows through. For a setting of -70 dB, the Gate closes completely when the trigger signal falls below the threshold. For a setting of -30 dB, however, the Gate half closes. For a setting of 0 dB, the Gate has no effect. When signals are gated abruptly, the sudden disappearance can sometimes sound odd. This parameter causes the Gate to reduce the signal level rather than cut it completely.



**ATTACK**—This determines how fast the Gate opens when the trigger exceeds the threshold level. Slow attack times can be used to remove the initial transient edge of percussive sounds. Too slow an attack time makes certain sounds appear backwards.

**HOLD**—This determines how long the Gate stays open once the trigger signal has fallen below the threshold level.

**DECAY**—This determines how fast the Gate closes once the hold time has expired. A longer decay time produces a more natural gating effect, allowing the natural decay of an instrument to pass through.

---

# Component Guide Part II

---

# 9

## In this chapter...

Effect .....	142
EQ .....	162
Fader .....	165
Filter .....	166
Input/Output .....	170
Matrix Mixer .....	171
Meter .....	174
Misc .....	175
Pan .....	178
Router .....	187
Switch .....	189
User Control .....	190
User Module .....	193

## Effect

There are 23 components in the Effect group, as below.

### Reverb-type Effects

Reverb Hall, Reverb Room, Reverb Stage, Reverb Plate, Early Ref, Gate Reverb, and Reverse Gate.

### Delays

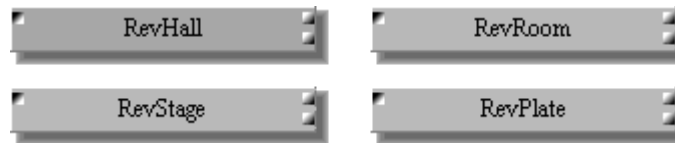
Mono Delay, Stereo Delay, Mod Delay, Delay LCR, and Echo.

### Modulation-type Effects

Chorus, Flange, Symphonic, Phaser, Auto Pan, Tremolo, HQ Pitch, Dual Pitch, Mod Filter, Dyna Filter, and Dyna Flange.

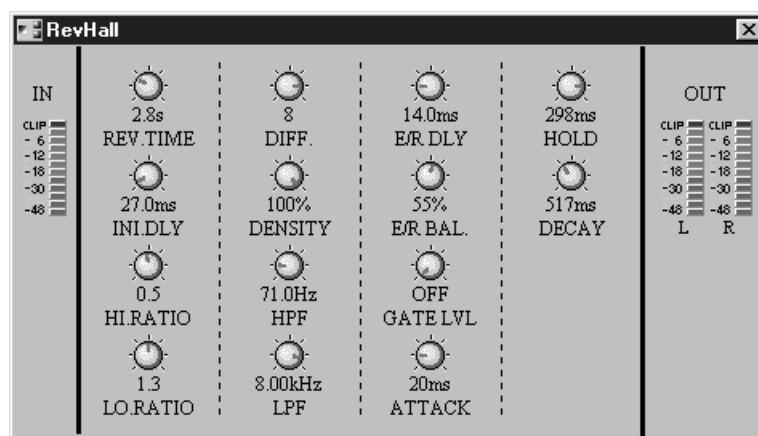
## Reverb Hall, Reverb Room, Reverb Stage, Reverb Plate

The Reverb Hall component simulates a large space, like a concert hall, while Reverb Room simulates a smaller space. Reverb Stage simulates a live stage, ideal for vocals, while Reverb Plate simulates the hard-edged sound of a metal-plate reverb.



All components feature one input and stereo outputs. Since the only difference between all the components is their reverb algorithm, only the Reverb Hall control window is shown here.

Each control window consists of reverb controls, input level meter, and stereo output level meters.



The IN meter displays the input signal level, while the OUT meters display the stereo output signal levels.

Parameter	Range	Description
REV TIME	0.3–99.0 sec	Reverb time
INI.DLY	0.0–500.0 ms	Initial delay before reverb begins
HI.RATIO	0.1–1.0	High-frequency reverb time ratio
LO.RATIO	0.1–2.4	Low-frequency reverb time ratio
DIFF.	0–10	Reverb diffusion (left–right reverb spread)
DENSITY	0–100%	Reverb density
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
LPF	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)
E/R DLY	0.0–100.0 ms	Delay between early reflections and reverb
E/R BAL.	0–100%	Balance between early reflections and reverb (0% = all reverb, 100% = all early reflections)
GATE LVL	OFF, –60 to 0 dB	Level at which gate kicks in (OFF = gate off)
ATTACK	0–120 ms	Gate opening speed
HOLD	1	Gate hold time
DECAY	2	Gate closing speed

- 0.02 ms–2.13 sec (fs = 44.1 kHz), 0.02 ms–1.96 sec (fs = 48 kHz)
- 6 ms–46.0 sec (fs = 44.1 kHz), 5 ms–42.3 sec (fs = 48 kHz)

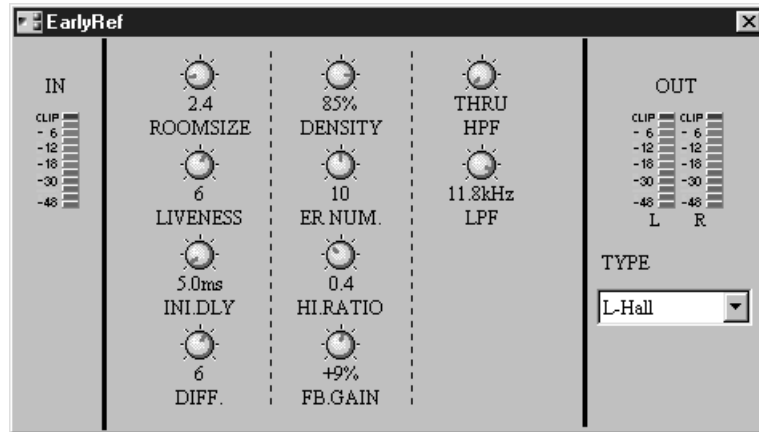
## Early Ref.

The Early Ref. component highlights the early reflections in a reverb pattern, providing a lively effect than plain reverb.



The Early Ref. component features one input and stereo outputs.

The Early Ref. control window consists of early reflection controls, input level meter, stereo output level meters, and reflection pattern type selector.



The IN meter displays the input signal level, while the OUT meters display the stereo output signal levels.

Parameter	Range	Description
ROOMSIZE	0.1–20.0	Reflection spacing
LIVENESS	0–10	Early reflections decay characteristics (0 = dead, 10 = live)
INI.DLY	0.0–500.0 ms	Initial delay before reverb begins
DIFF.	0–10	Reverb diffusion (left–right reverb spread)
DENSITY	0–100%	Reverb density
ER NUM.	1–19	Number of early reflections
HI.RATIO	0.1–1.0	High-frequency feedback ratio
FB. GAIN	–99 to +99%	Feedback gain
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
LPF	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)
TYPE	1	Type of early reflection simulation

1. S-Hall (small hall), L-Hall (large hall), Random, Reverse, Plate, Spring

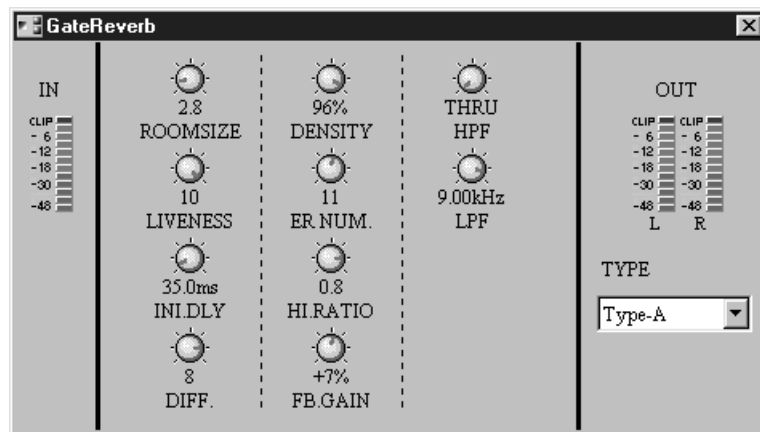
## Gate Reverb & Reverse Gate

The Gate Reverb component offers an early-reflection reverb with gate, while the Reverse Gate component offers early-reflections with a reverse gate.



Both components feature one input and stereo outputs. Since the only difference between these components is their reverb algorithm, only the Gate Reverb control window is shown here.

Each control window consists of early reflection controls, input level meter, stereo output level meters, and reflection pattern type selector.



The IN meter displays the input signal level, while the OUT meters display the stereo output signal levels.

Parameter	Range	Description
ROOMSIZE	0.1–20.0	Reflection spacing
LIVENESS	0–10	Early reflections decay characteristics (0 = dead, 10 = live)
INI.DLY	0.0–500.0 ms	Initial delay before reverb begins
DIFF.	0–10	Reverb diffusion (left–right reverb spread)
DENSITY	0–100%	Reverb density
ER.NUM.	1–19	Number of early reflections
HI.RATIO	0.1–1.0	High-frequency feedback ratio
FB.GAIN	–99 to +99%	Feedback gain
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
LPF	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)
TYPE	Type-A, Type-B	Type of early reflection simulation

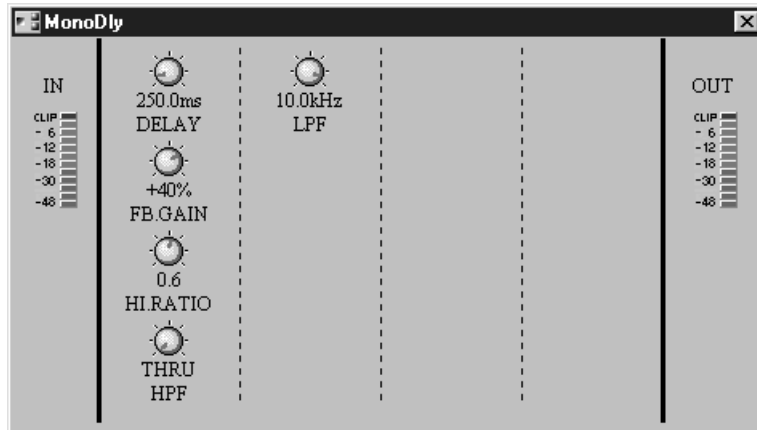
## Mono Delay

The Mono Delay component offers a no-nonsense single-channel delay.



The Mono Delay component features one input and one output.

The Mono Delay control window consists of delay controls, input level meter, and output level meter.



The IN meter displays the input signal level, while the OUT meter displays the output signal level.

Parameter	Range	Description
DELAY	0.0–2730.0 ms	Delay time
FB.GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
HI.RATIO	0.1–1.0	High-frequency feedback ratio
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
LPF	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)

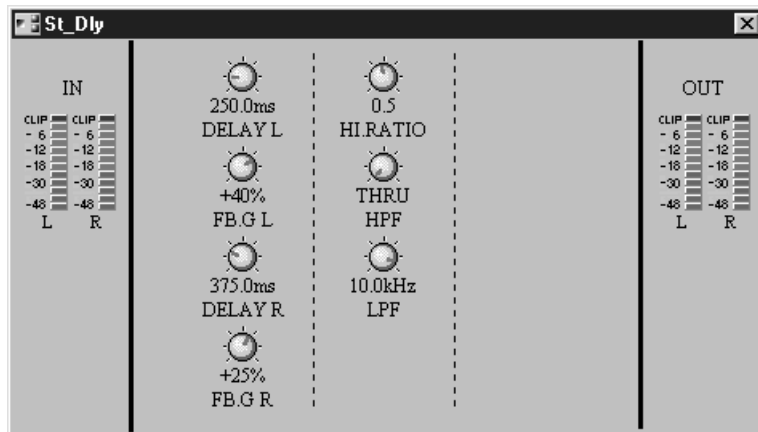
## Stereo Delay

The Stereo Delay component offers a two-channel delay with independent delay and feedback controls for each channel.



The Stereo Delay component features two inputs and two outputs.

The Stereo Delay control window consists of delay controls, input level meters, and output level meters.



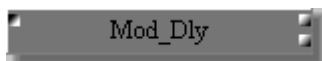
The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>DELAY L</b>	0.0–1350.0 ms	Left-channel delay time
<b>FB.G L</b>	–99 to +99%	Left-channel feedback (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>DELAY R</b>	0.0–1350.0 ms	Right-channel delay time
<b>FB.G R</b>	–99 to +99%	Right-channel feedback (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>HI.RATIO</b>	0.1–1.0	High-frequency feedback ratio
<b>HPF</b>	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
<b>LPF</b>	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)



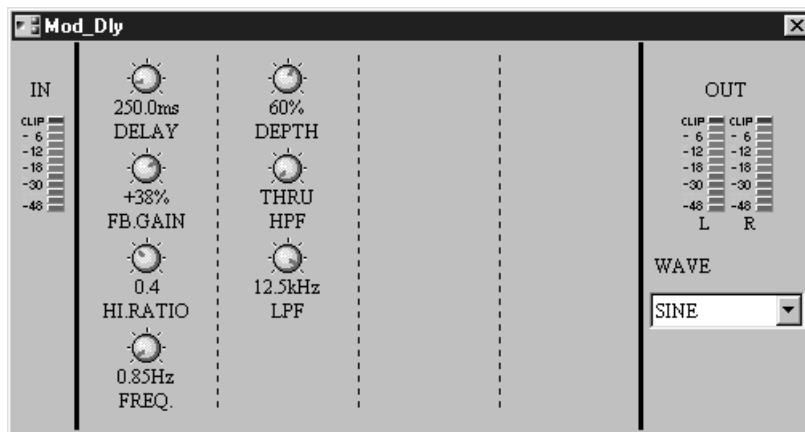
## Mod Delay

The Mod Delay component offers a single-channel delay with modulation.



The Mod Delay component features one input and stereo outputs.

The Mod Delay control window consists of delay controls, input level meter, and stereo output level meters.

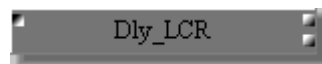


The IN meter displays the input signal level, while the OUT meters display the stereo output signal levels.

Parameter	Range	Description
DELAY	0.0–2725.0 ms	Delay time
FB.GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
HI.RATIO	0.1–1.0	High-frequency feedback ratio
FREQ.	0.05–40.00 Hz	Modulation speed
DEPTH	0–100%	Modulation depth
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
LPF	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)
WAVE	SINE, TRI	Modulation waveform

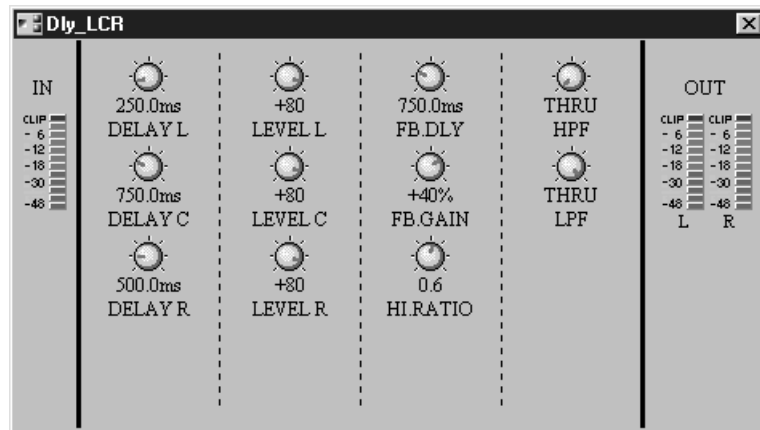
## Delay LCR

The Delay LCR component offers a single-channel delay with left, center, and right taps.



The Delay LCR component features one input and stereo outputs.

The Delay LCR control window consists of delay controls, input level meter, and stereo output level meters.



The IN meter displays the input signal level, while the OUT meters display the stereo output signal levels.

Parameter	Range	Description
<b>DELAY L</b>	0.0–2730.0 ms	Left-channel delay time
<b>DELAY C</b>	0.0–2730.0 ms	Center delay time
<b>DELAY R</b>	0.0–2730.0 ms	Right-channel delay time
<b>LEVEL L</b>	–100 to +100%	Left-channel delay level
<b>LEVEL C</b>	–100 to +100%	Center delay level
<b>LEVEL R</b>	–100 to +100%	Right-channel delay level
<b>FB.DLY</b>	0.0–2730.0 ms	Feedback delay time
<b>FB.GAIN</b>	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>HI.RATIO</b>	0.1–1.0	High-frequency feedback ratio
<b>HPF</b>	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
<b>LPF</b>	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)

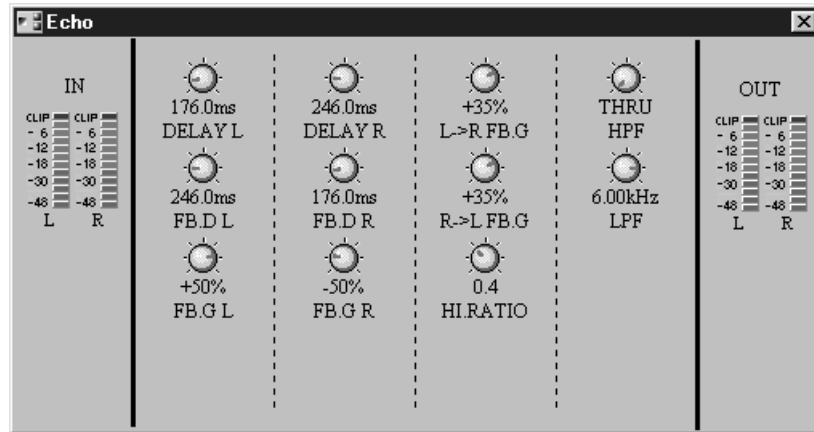
## Echo

The Echo component offers a two-channel delay with independent delay and feedback controls for each channel, plus left-to-right and right-to-left feedback controls.



The Echo component features two inputs and two outputs.

The Echo control window consists of echo controls, input level meters, and output level meters.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
DELAY L	0.0–1350.0 ms	Left-channel delay time
FB.D L	0.0–1350.0 ms	Left-channel feedback delay time
FB.G L	–99 to +99%	Left-channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
DELAY R	0.0–1350.0 ms	Right-channel delay time
FB.D R	0.0–1350.0 ms	Right-channel feedback delay time
FB.G R	–99 to +99%	Right-channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
L->R FB.G	–99 to +99%	Left-to-right channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
R->L FB.G	–99 to +99%	Right-to-left channel feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
HI.RATIO	0.1–1.0	High-frequency feedback ratio
HPF	THRU, 21.2 Hz–8.00 kHz	High-pass filter cutoff frequency (THRU = filter off)
LPF	50.0 Hz–16.0 kHz, THRU	Low-pass filter cutoff frequency (THRU = filter off)

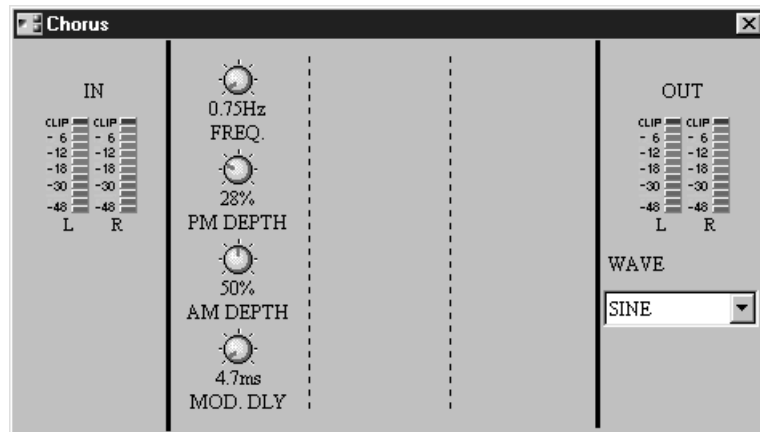
## Chorus

The Chorus component offers two-channel chorus effects.



The Chorus component features two inputs and two outputs.

The Chorus control window consists of chorus controls, input level meters, output level meters, and modulation wave selector.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>FREQ.</b>	0.05–40.00 Hz	Modulation speed
<b>PM DEPTH</b>	0–100%	Pulse modulation depth
<b>AM DEPTH</b>	0–100%	Amplitude modulation depth
<b>MOD.DLY</b>	0.0–500.0 ms	Modulation delay time
<b>WAVE</b>	SINE, TRI	Modulation waveform

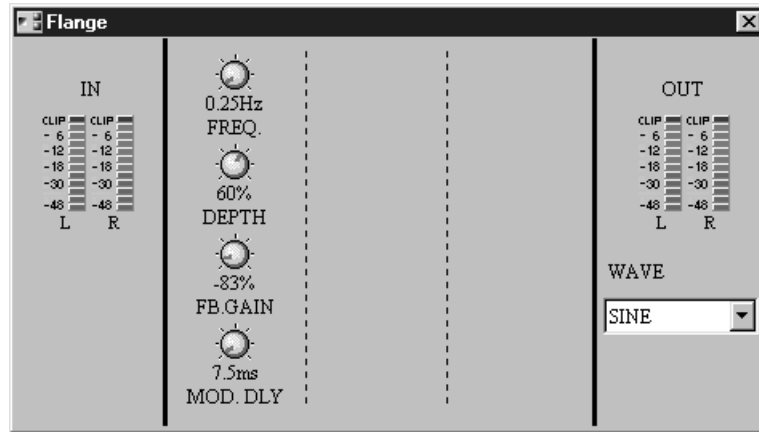
## Flange

The Flange component offers two-channel flanging effects.



The Flange component features two inputs and two outputs.

The Flange control window consists of flanger controls, input level meters, output level meters, and modulation wave selector.

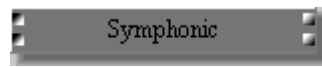


The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
FREQ.	0.05–40.00 Hz	Modulation speed
DEPTH	0–100%	Modulation depth
FB.GAIN	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
MOD.DLY	0.0–500.0 ms	Modulation delay time
WAVE	SINE, TRI	Modulation waveform

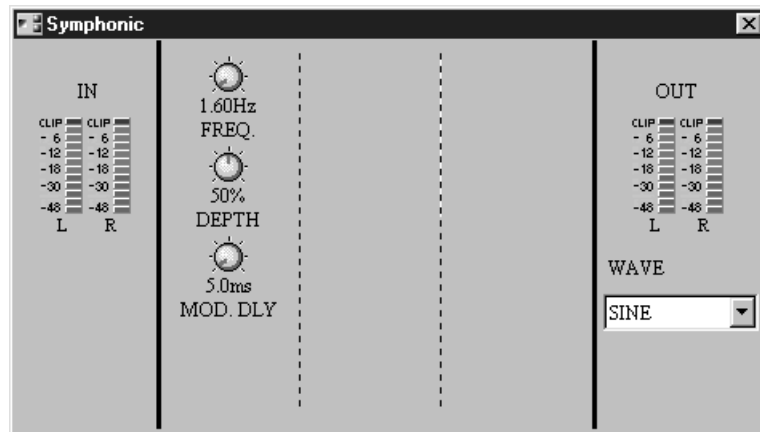
## Symphonic

The Symphonic component offers a richer, more complex two-channel modulation effect than regular chorus and is proprietary to Yamaha.



The Symphonic component features two inputs and two outputs.

The Symphonic control window consists of symphonic controls, input level meters, output level meters, and modulation wave selector.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>FREQ.</b>	0.05–40.00 Hz	Modulation speed
<b>DEPTH</b>	0–100%	Modulation depth
<b>MOD.DLY</b>	0.0–500.0 ms	Modulation delay time
<b>WAVE</b>	SINE, TRI	Modulation waveform

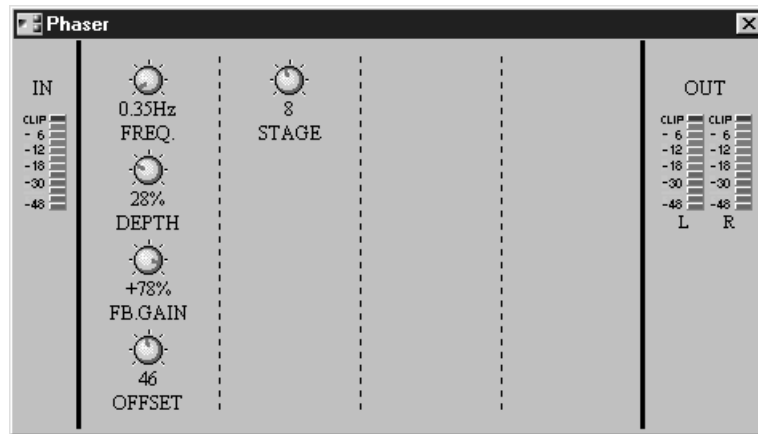
## Phaser

The Phaser component offers stereo phasing effects, with between 2 and 16 phase-shift stages.



The Phaser component features one input and stereo outputs.

The Phaser control window consists of phaser controls, input level meter, and stereo output level meters.

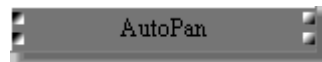


The IN meter displays the input signal level, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>FREQ.</b>	0.05–40.00 Hz	Modulation speed
<b>DEPTH</b>	0–100%	Modulation depth
<b>FB.GAIN</b>	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>OFFSET</b>	0–100	Lowest phase-shifted frequency offset
<b>STAGE</b>	2, 4, 6, 8, 10, 12, 14, 16	Number of phase-shift stages

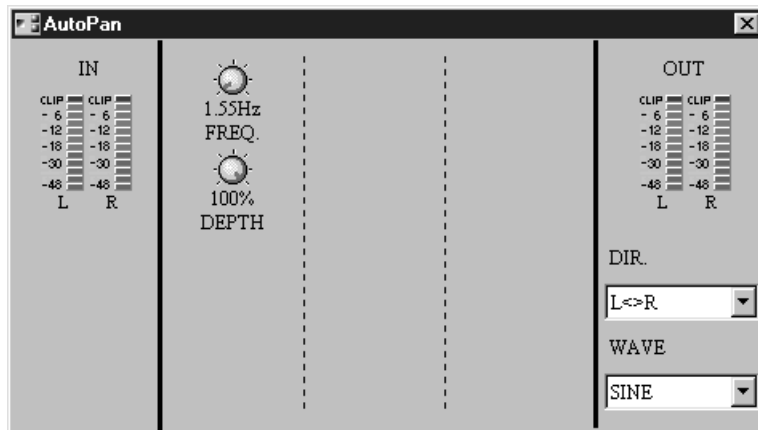
## Auto Pan

The Auto Pan component offers two-channel auto panning.



The Auto Pan component features two inputs and two outputs.

The Auto Pan control window consists of auto-pan controls, input level meters, output level meters, and direction (DIR) and modulation wave selectors.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>FREQ.</b>	0.05–40.00 Hz	Modulation speed
<b>DEPTH</b>	0–100%	Modulation depth
<b>DIR.</b>	1	Panning direction
<b>WAVE</b>	SINE, TRI, SQR	Modulation waveform (sine, triangular, or square)

1. L<->R, L->R, L<-R, Turn L, Turn R



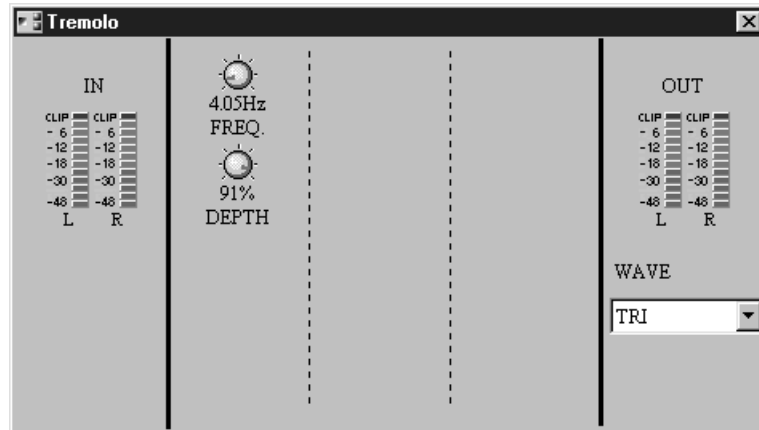
## Tremolo

The Tremolo component offers a two-channel tremolo effect.



The Tremolo component features two inputs and two outputs.

The Tremolo control window consists of tremolo controls, input level meters, output level meters, and a modulation wave selector.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>FREQ.</b>	0.05–40.00 Hz	Modulation speed
<b>DEPTH</b>	0–100%	Modulation depth
<b>WAVE</b>	SINE, TRI, SQR	Modulation waveform (sine, triangular, or square)

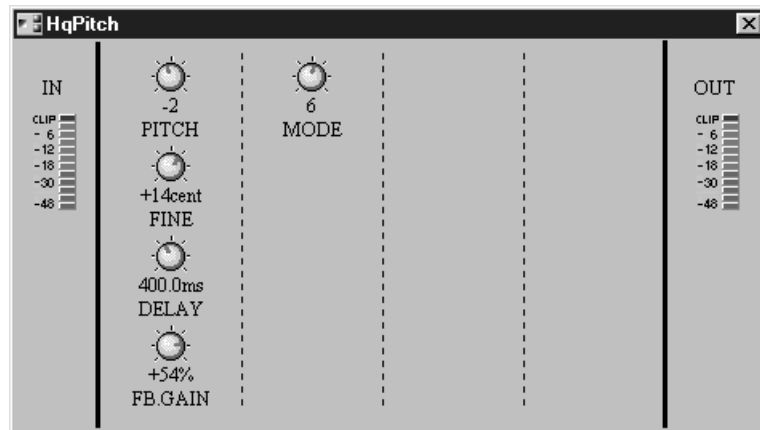
## HQ. Pitch

The HQ Pitch component offers high-quality pitch shifting.



The HQ Pitch component features one input and one output.

The HQ Pitch control window consists of pitch controls, input level meter, and output level meter.



The IN meter displays the input signal level, while the OUT meter displays the output signal level.

Parameter	Range	Description
<b>PITCH</b>	-12 to +12 semitones	Pitch shift amount
<b>FINE</b>	-50 to +50 cents	Pitch shift fine amount
<b>DELAY</b>	0.0–1000.0 ms	Pitch shift delay time
<b>FB.GAIN</b>	-99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>MODE</b>	1–10	Pitch shift precision

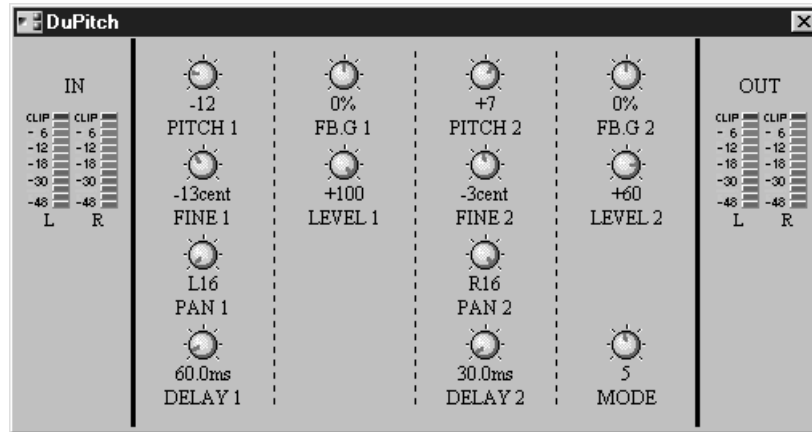
## Dual Pitch

The Dual Pitch component offers two-channel pitch shifting with independent pitch controls for each channel.



The Dual Pitch component features two inputs and two outputs.

The Dual Pitch control window consists of pitch controls, input level meters, and output level meters.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>PITCH 1</b>	-24 to +24 semitones	Pitch change 1 pitch shift amount
<b>FINE 1</b>	-50 to +50 cents	Pitch change 1 pitch shift fine amount
<b>PAN 1</b>	L16-CENTER-R16	Pitch change 1 pan
<b>DELAY 1</b>	0.0-1000.0 ms	Pitch change 1 delay time
<b>FB.G 1</b>	-99 to +99%	Pitch change 1 feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>LEVEL 1</b>	-100 to +100	Pitch change 1 level (plus values for normal phase, minus values for reverse phase)
<b>PITCH 2</b>	-24 to +24 semitones	Pitch change 2 pitch shift amount
<b>FINE 2</b>	-50 to +50 cents	Pitch change 2 pitch shift fine amount
<b>PAN 2</b>	L16-CENTER-R16	Pitch change 2 pan
<b>DELAY 2</b>	0.0-1000.0 ms	Pitch change 2 delay time
<b>FB.G 2</b>	-99 to +99%	Pitch change 2 feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>LEVEL 2</b>	-100 to +100	Pitch change 2 level (plus values for normal phase, minus values for reverse phase)
<b>MODE</b>	1-10	Pitch shift precision

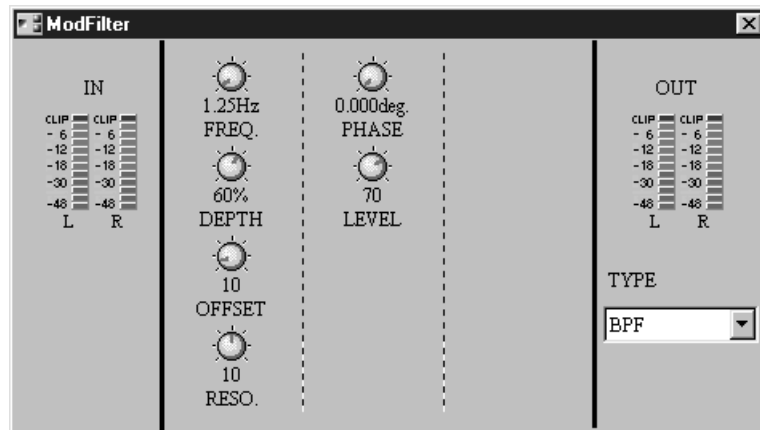
## Mod Filter

The Mod Filter component offers two-channel modulated filter effects.



The Mod Filter component features two inputs and two outputs.

The Mod Filter control window consists of mod filter controls, input level meters, output level meters, and a filter type selector.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>FREQ.</b>	0.05–40.00 Hz	Modulation speed
<b>DEPTH</b>	0–100%	Modulation depth
<b>OFFSET</b>	0–100	Filter frequency offset
<b>RESO.</b>	0–20	Filter resonance
<b>PHASE</b>	0.00–354.375°	Left and right modulation phase difference
<b>LEVEL</b>	0–100	Output level
<b>TYPE</b>	LPF, HPF, BPF	Filter type: low-pass, high-pass, or band-pass

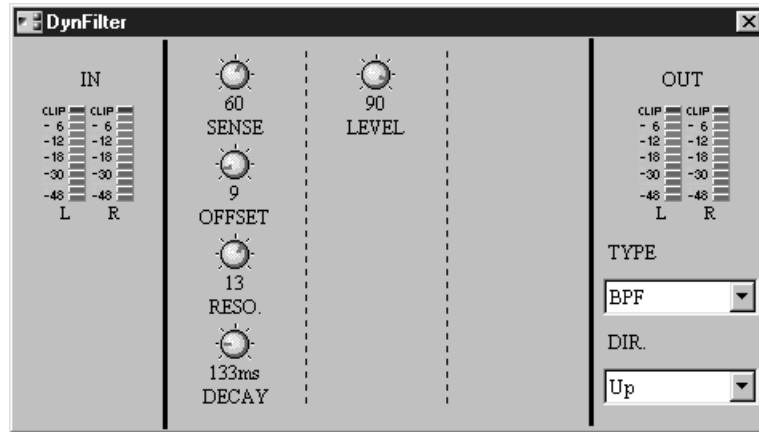
## Dyna Filter

The Dyna Filter component offers two-channel dynamic filtering effects.



The Dyna Filter component features two inputs and two outputs.

The Dyna Filter control window consists of filter controls, input level meters, output level meters, and filter type and direction (DIR) selectors.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>SENSE</b>	0–100	Input sensitivity
<b>OFFSET</b>	0–100	Filter frequency offset
<b>RESO.</b>	0–20	Filter resonance
<b>DECAY</b>	1	Speed of filter frequency changes
<b>LEVEL</b>	0–100	Output Level
<b>TYPE</b>	LPF, HPF, BPF	Filter type
<b>DIR.</b>	Up, Down	Direction of filter frequency changes (filter frequency reacts to the input signal)

1. 6 ms–46.0 s ( $f_s = 44.1$  kHz), 5 ms–42.3 s ( $f_s = 48$  kHz)

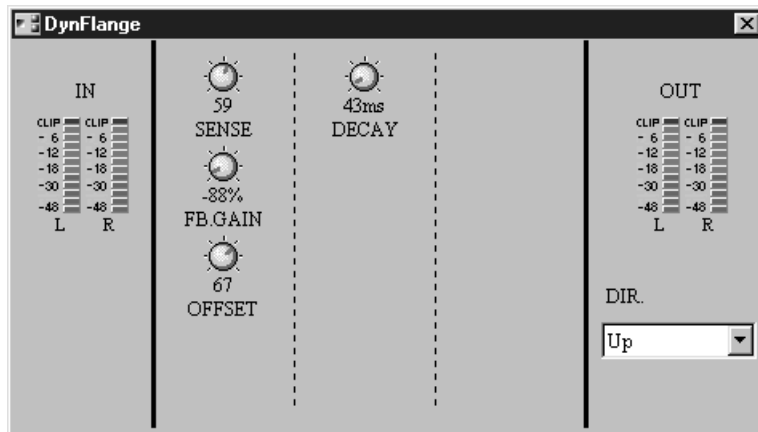
## Dyna Flange

The Dyna Flange component offers two-channel dynamic flanging effects.



The Dyna Flange component features two inputs and two outputs.

The Dyna Flange control window consists of flanger controls, input level meters, output level meters, and a direction (DIR) selector.



The IN meters display the input signal levels, while the OUT meters display the output signal levels.

Parameter	Range	Description
<b>SENSE</b>	0–100	Input sensitivity
<b>FB. GAIN</b>	–99 to +99%	Feedback gain (plus values for normal-phase feedback, minus values for reverse-phase feedback)
<b>OFFSET</b>	0–100	Delay time offset
<b>DECAY</b>	1	Speed of resonant frequency changes
<b>DIR.</b>	Up, Down	Direction of resonant frequency changes (resonant frequency reacts to the input signal)

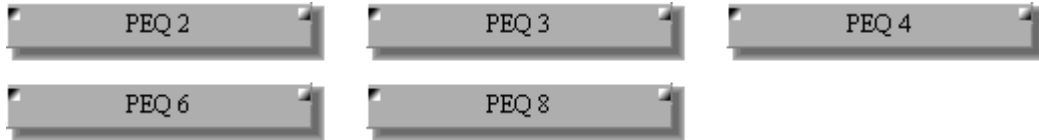
1. 6 ms–46.0 s (fs = 44.1 kHz), 5 ms–42.3 s (fs = 48 kHz)

## EQ

There are eight components in the EQ group. Five PEQs (parametric equalizers) and three GEQs (graphic equalizers).

### PEQ

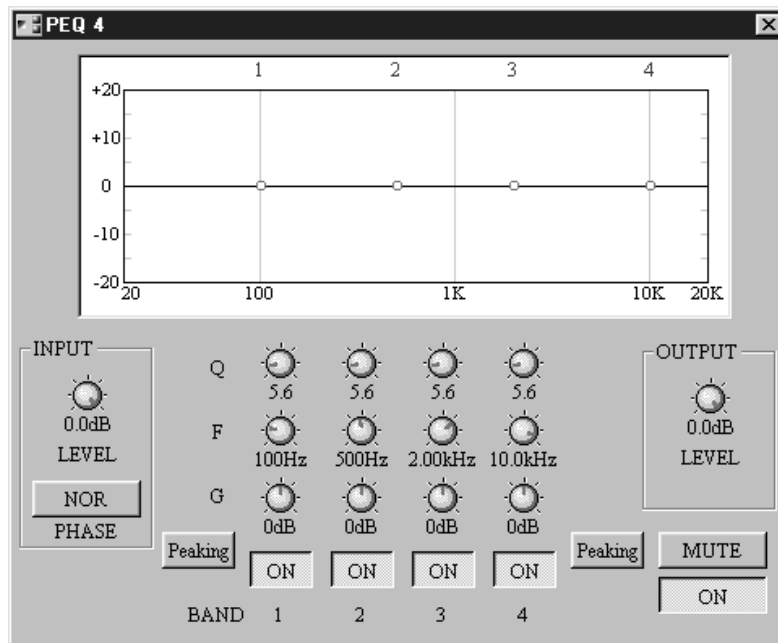
A PEQ (parametric equalizer) is used to boost or cut signals at specified frequencies.



All PEQ components feature one input and one output.

Since the only difference between all the PEQ components is the number of bands, only the 4 BAND PEQ control window is shown here.

Each PEQ control window features an EQ graph and INPUT, EQ BAND, and OUTPUT sections.

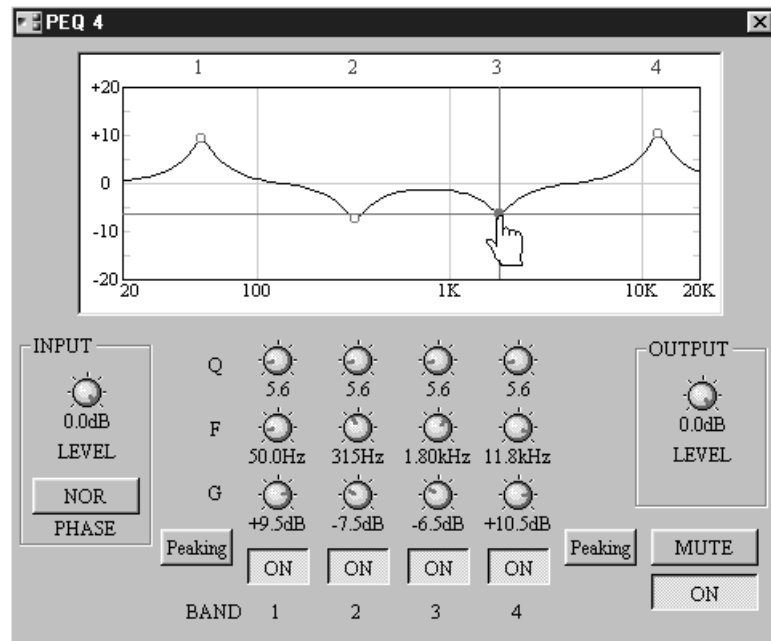


The PEQ component parameters are explained in the following table.

Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	PHASE	NOR/REV	Inverts the input signal
EQ BAND	Q	10–0.10	Adjusts the selectivity of each band
	F	20.0 Hz–20.0 kHz	Adjusts the frequency of each band
	G	–18 dB to +18 dB	Adjusts the gain of each band
	ON/OFF	ON/OFF	Turns each band on and off
	Type <sup>1</sup>	Peaking/L.Shelf or H.Shelf	Sets the filter type for the band
OUTPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the output signal level
MUTE		ON/OFF	Mutes the output

1. Top and bottom bands only.

The EQ graph at the top of the window displays the EQ settings graphically, as shown in the following example. The number of each EQ band appears along the top of the graph.



In addition to using the rotary controls, the frequency (F) and gain (G) parameters for each band can be set by dragging the small circles on the EQ graph. When the cursor is placed over a circle, it changes to a hand and the curve can then be dragged to achieve the required setting.



## GEQ

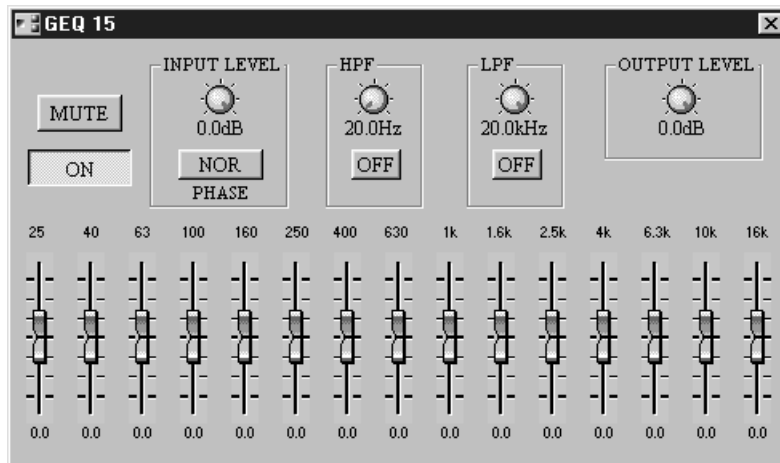
A GEQ (graphic equalizer) is used to boost or cut signals at preset frequencies using sliders, which provide a graphical representation of the EQ curve.



All GEQ components feature one input and one output.

Since the only difference between all the GEQ components is the number of bands, only the 15 BAND GEQ control window is shown here.

Each GEQ control window consists of five sections: INPUT, HPF, LPF, EQ bands, and OUTPUT. The center frequency of each band is shown above each slider.

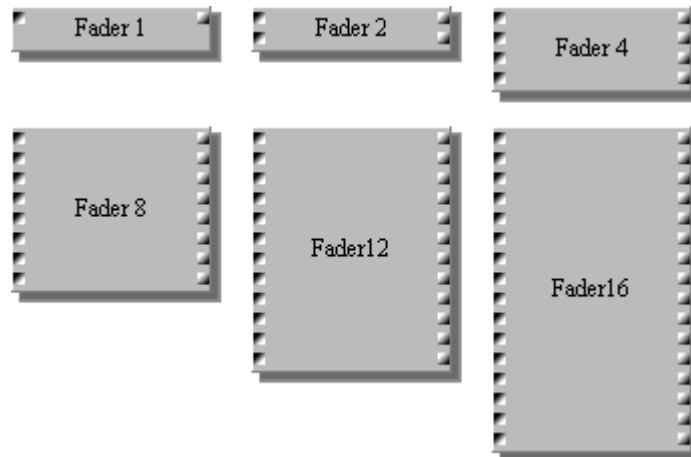


The GEQ component parameters are explained in the following table.

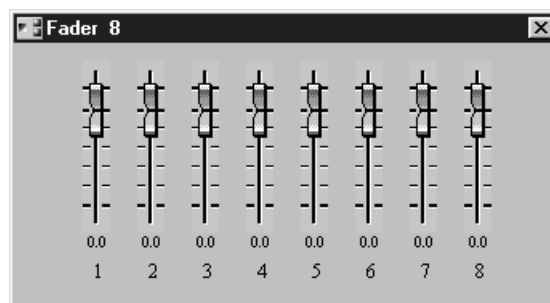
Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	PHASE	NOR/REV	Inverts the input signal
HPF	Frequency	20.0 Hz–20.0 kHz	Adjusts the HPF cutoff frequency
	ON	ON/OFF	Turns the HPF on or off
LPF	Frequency	20.0 Hz–20.0 kHz	Adjusts the LPF cutoff frequency
	ON	ON/OFF	Turns the LPF on or off
EQ band	Gain	–15 dB to +15 dB	Adjusts the gain of each band
OUTPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the output signal level
MUTE		ON/OFF	Mutes the output

## Fader

There are six components in the Fader group, with 1, 2, 4, 8, 12, and 16 channel versions. Each channel features one input, one output, and a fader.



Since the only difference between all the Fader components is the number of channels, only the 8-channel Fader Control window is shown here.



The Fader component parameters are explained in the following table.

Parameter	Range	Description
Faders	-Infinity dB to 6.0 dB	Adjusts the output signal level of each channel

## Filter

There are four components in the Filter group: HPF (high-pass filter), LPF (low-pass filter), BPF (band-pass filter), and NOTCH (notch filter).

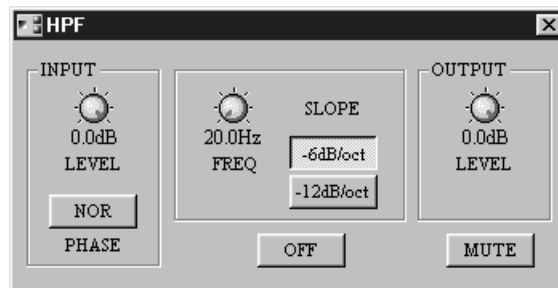
### HPF

An HPF (high-pass filter) attenuates signals below the specified frequency while allowing signals above that frequency to pass through unaffected.



The HPF component features one input and one output.

The HPF control window features INPUT, filter, and OUTPUT sections.



The HPF component parameters are explained in the following table.

Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	PHASE	NOR/REV	Inverts the input signal
Filter	FREQ	20.0 Hz–20.0 kHz	Adjusts HPF cutoff frequency
	SLOPE	–6 dB/octave, –12 dB/octave	Selects the filter slope
OUTPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the output signal level
MUTE		ON/OFF	Mutes the output

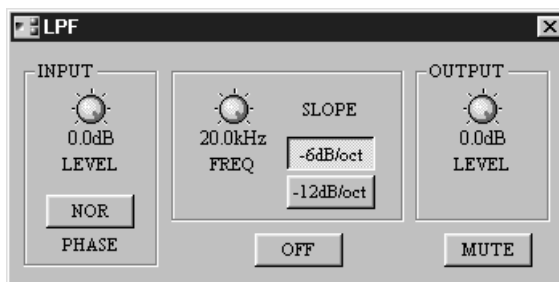
## LPF

An LPF (low-pass filter) attenuates signals above the specified frequency while allowing signals below that frequency to pass through unaffected.



The LPF component features one input and one output.

The LPF control window features INPUT, filter, and OUTPUT sections.



The LPF component parameters are explained in the following table.

Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	-Infinity dB to 0.0 dB	Adjusts the input signal level
	PHASE	NOR/REV	Inverts the input signal
Filter	FREQ	20.0 Hz–20.0 kHz	Adjusts the LPF cutoff frequency
	SLOPE	-6 dB/octave, -12 dB/octave	Selects the filter slope
OUTPUT	LEVEL	-Infinity dB to 0.0 dB	Adjusts the output signal level
MUTE		ON/OFF	Mutes the output

## BPF

A BPF (band-pass filter) attenuates signals above and below the specified center frequency while allowing a band of signals around that frequency to pass through unaffected.



The BPF component features one input and one output.

The BPF control window features INPUT, filter, and OUTPUT sections.

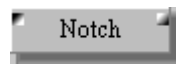


The BPF component parameters are explained in the following table.

Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	PHASE	NOR/REV	Inverts the input signal
Filter	FREQ	20.0 Hz–20.0 kHz	Adjusts the BPF center frequency
	Q	10–0.10	Adjusts the filter's selectivity
OUTPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the output signal level
MUTE		ON/OFF	Mutes the output

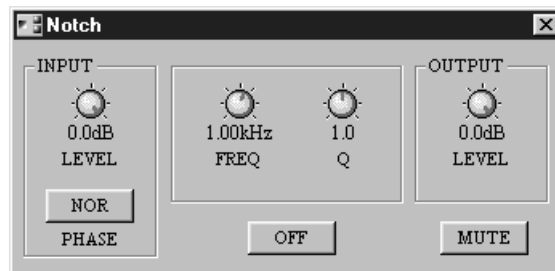
## Notch

A notch filter attenuates a band of signals around the specified center frequency while allowing signals above and below that frequency to pass through unaffected.



The Notch component features one input and one output.

The Notch control window features INPUT, filter, and OUTPUT sections.



The Notch component parameters are explained in the following table.

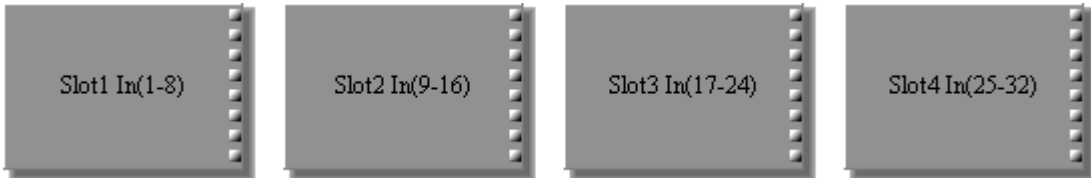
Section	Parameter	Range	Description
ON/OFF		ON/OFF	Turns the component on and off
INPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the input signal level
	PHASE	NOR/REV	Inverts the input signal
Filter	FREQ	20.0 Hz–20.0 kHz	Adjusts the notch filter’s center frequency
	Q	10–0.10	Adjusts the filter’s selectivity
OUTPUT	LEVEL	–Infinity dB to 0.0 dB	Adjusts the output signal level
MUTE		ON/OFF	Mutes the output

## Input/Output

The Input and Output components represent the DME32’s SLOT inputs and outputs. There are eight components in the Input/Output group. Four Input components for use with slot inputs 1 through 32 and four Output components for use with slot outputs 1 through 32.

### Input

Each Input component features eight outputs.



There are no control windows for the Input components.

The Input components correspond to the DME32’s four I/O slots as follows:

Slot	Component
1	Input 1Ch–8Ch
2	Input 9Ch–16Ch
3	Input 17Ch–24Ch
4	Input 25Ch–32Ch

### Output

Each Output component features eight inputs.



There are no control windows for the Output components.

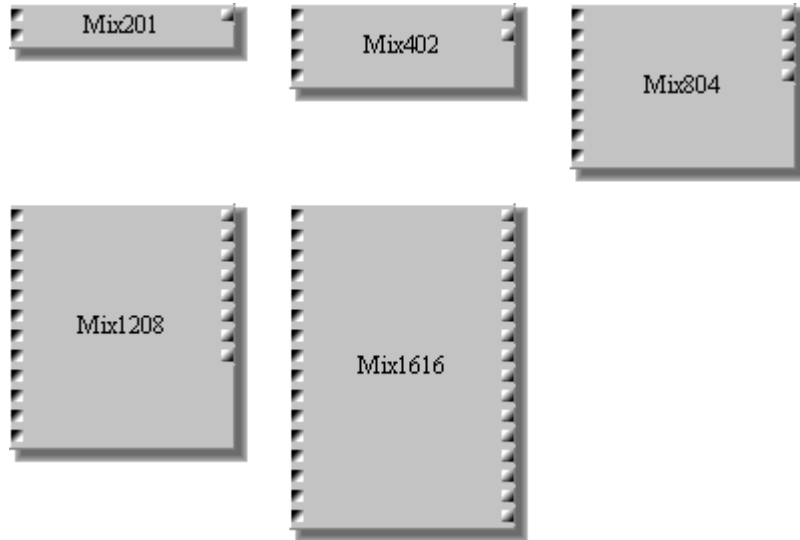
The Output components correspond to the DME32’s four I/O slots as follows:

Slot	Component
1	Output 1Ch–8Ch
2	Output 9Ch–16Ch
3	Output 17Ch–24Ch
4	Output 25Ch–32Ch

# Matrix Mixer

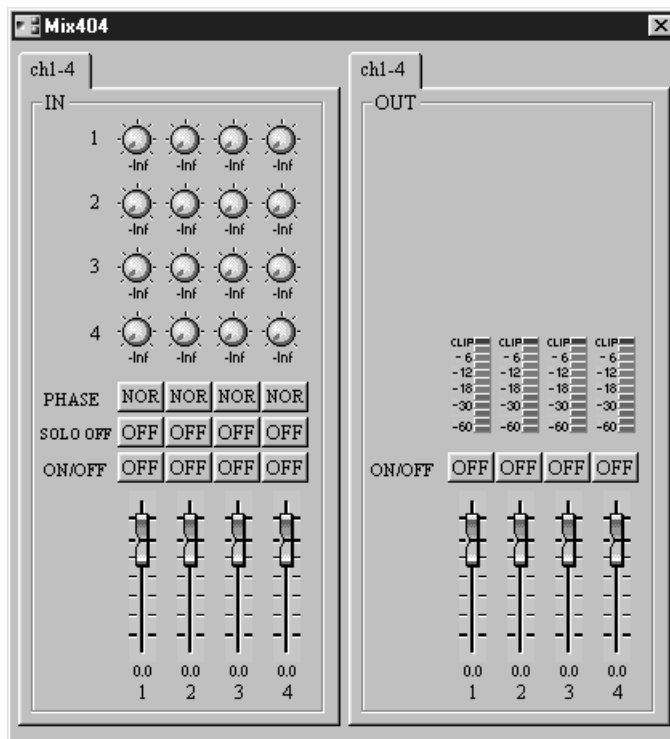
The 20 Matrix Mixer components are organized by number of inputs into five groups: 2x, 4x, 8x, 12x, and 16x.

A Matrix Mixer component from each group is shown below.



Since the only difference between all the Matrix Mixer components is the number of inputs and outputs, only the 4x4 Matrix Mixer control window is shown here.

Each Matrix Mixer control window features an IN section, with various input channel controls, and an OUT section, with fader and meter for each output channel.



When a channel is soloed, "SOLO OFF" changes to "SOLO ON." This is especially convenient on control windows where the input channels are organized into pages and it's not possible to see all SOLO buttons simultaneously.

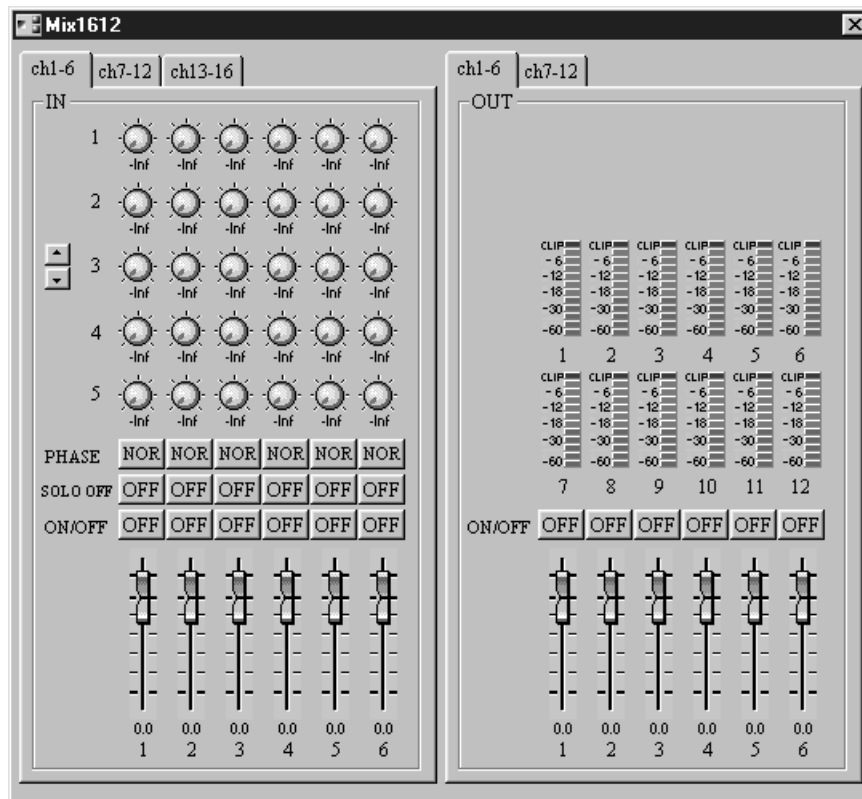



The OUT meters display the level of each output signal.

Section	Parameter	Range	Description
IN	Bus level	–Infinity dB to 0.0 dB	Adjusts the level of each input channel signal that is fed to each output channel
	PHASE	NOR/REV	Inverts each input channel signal
	SOLO	ON/OFF	Solos each input channel
	ON/OFF	ON/OFF	Mutes each input channel
	Fader	–Infinity dB to 6.0 dB	Adjusts the level of each input channel
OUT	ON/OFF	ON/OFF	Mutes each output channel
	Fader	–Infinity dB to 6.0 dB	Adjusts the level of each output channel

Note that Matrix Mixer components with only one output (x1) do not feature bus level controls, so the level of the input channel signal that is fed to the single output channel is controlled solely by the input channel faders.

For Matrix Mixer components with more than six inputs or outputs, channels are arranged into pages consisting of six channels. Pages are selected by clicking the tabs along the top of the control window, as shown on the 16x12 Matrix Mixer below.



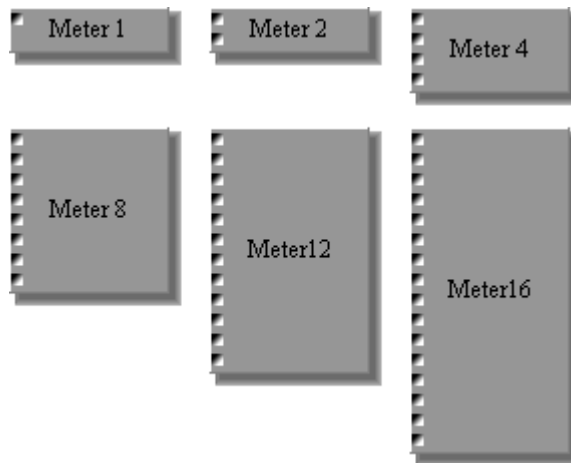
 For components with more than five outputs (i.e., more than five bus level controls per input channel), the bus level controls in the IN section can be scrolled up or down by clicking these two arrow buttons.

The following Matrix Mixers are available.

<b>Group</b>	<b>Matrix Mixer</b>	<b>Inputs</b>	<b>Outputs</b>
<b>2x</b>	<b>2x1</b>	2	1
	<b>2x2</b>		2
<b>4x</b>	<b>4x1</b>	4	1
	<b>4x2</b>		2
	<b>4x4</b>		4
<b>8x</b>	<b>8x1</b>	8	1
	<b>8x2</b>		2
	<b>8x4</b>		4
	<b>8x8</b>		8
<b>12x</b>	<b>12x1</b>	12	1
	<b>12x2</b>		2
	<b>12x4</b>		4
	<b>12x8</b>		8
	<b>12x12</b>		12
<b>16x</b>	<b>16x1</b>	16	1
	<b>16x2</b>		2
	<b>16x4</b>		4
	<b>16x8</b>		8
	<b>16x12</b>		12
	<b>16x16</b>		16

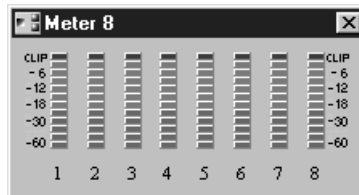
## Meter

There are six components in the Meter group, with 1, 2, 4, 8, 12, and 16 channel versions. Each channel features one input and a level meter.



Since the only difference between all the Meter components is the number of channels, only the 8-channel Meter window is shown here.

Each Meter control window features 12-segment level meters.



The Meter component parameters are explained in the following table.

Parameter	Range	Description
Meter	-60, -30, -18, -12, -6, CLIP	Displays the signal level of each channel

## Misc

There are three components in the Miscellaneous group: Gain Trimmer, Oscillator, and System Mute.

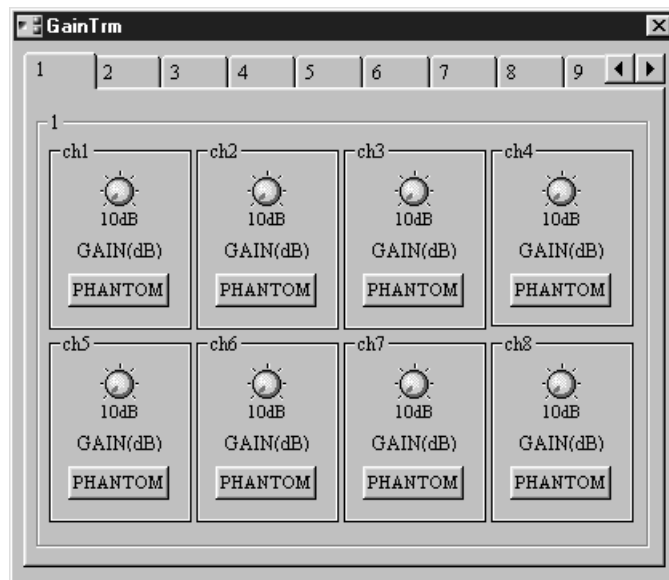
### Gain Trimmer

The Gain Trimmer component offers remote control and recall of up to 16 Yamaha AD824 A/D Converters. See page 256 for information on using the AD824 with the DME32.



The Gain Trimmer component has no inputs or outputs.

The Gain Trimmer control window features 16 pages, one for each AD824. Pages can be selected by clicking the arrow buttons to the far-right of the tabs. Each page features eight gain controls and eight phantom power buttons.



The Gain Trimmer component parameters are explained in the following table.

Parameter	Range	Description
<b>GAIN</b>	10 dB to -62 dB	Sets the head-amp gain for each AD824 channel
<b>PHANTOM</b>	ON/OFF	Turns on and off the +48V phantom power for each AD824 channel

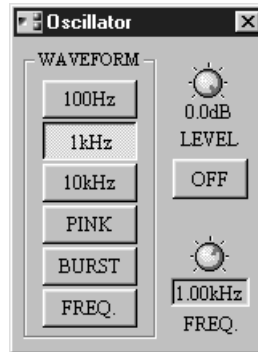
## Oscillator

The Oscillator component offers a useful 10 Hz to 20 kHz sine wave oscillator, with 100 Hz, 1 kHz, and 10 kHz presets, pink noise, and burst pink noise. It can be patched into a system as and where needed and is convenient for calibration and diagnostic purposes. Burst pink noise is also useful for auditioning reverb settings.



The Oscillator component has one output.

The Oscillator control window features a WAVEFORM section, frequency control section, and output level control.



In addition to dragging the FREQ control, frequencies can be specified using the computer keyboard. Simply select the value below the FREQ control using the mouse, enter a value from the keyboard, and then press the Enter key. The new value is set and the FREQ control moves to its new position.

The Oscillator component parameters are explained in the following table.

Parameter	Range	Description
WAVEFORM	100Hz	100 Hz sine wave
	1kHz	1 kHz sine wave
	10kHz	10 kHz sine wave
	PINK	Pick noise
	BURST	Pink noise bursts (200 ms pulses at 4 second intervals)
	FREQ	Variable sine wave frequency from 10 Hz to 20 kHz
LEVEL	–Infinity dB to 0.0 dB	Adjusts the oscillator’s output level
ON/OFF	ON/OFF	Turns the oscillator on and off

*Note: When using the oscillator, be careful with volume levels—nobody likes sudden loud noises, or worse, speaker damage.*

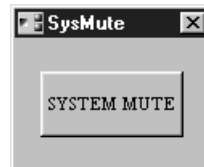
## System Mute

The System Mute component allows the entire system to be muted with a single mouse click.



The System Mute component has no inputs or outputs.

The System Mute control window features only the SYSTEM MUTE button.



When the SYSTEM MUTE button is clicked, all the outputs of the entire DME32 system, including the outputs of all DME32s in a multiple-unit system, are muted. All outputs are unmuted when the button is clicked again.

## Pan

There are five components in the Pan group: LCR, Pan, Surround 2+2, Surround 3+1, and Surround 5.1.

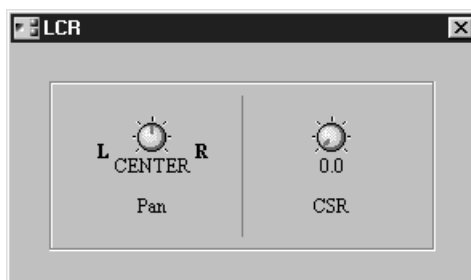
### LCR

The LCR component offers left, center, and right channel panning.



The LCR component features one input and three outputs: L (left), C (center), and R (right).

The LCR control window consists of pan and CSR (center-side ratio) controls.



The LCR component parameters are explained in the following table.

Parameter	Range	Description
PAN	L63–CENTER–R63	Pans the input signal between the left and right outputs
CSR	0.0–1.0	Adjusts the amount of front-center signal fed to the L, R, and C outputs.

When the CSR control is set to 0, the front-center signal is fed only to the L and R outputs. When it's set to 0.5, the front-center signal is fed equally to the L, R, and C outputs. And when it's set to 1.0, the front-center signal is fed only to the C output.

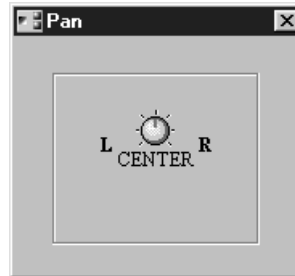
## Pan

The Pan component offers a basic pan control.



The Pan component features one input and two outputs: L (left) and R (right).

The Pan control window consists of a single pan control.



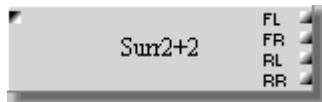
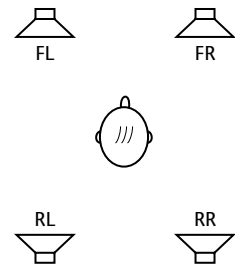
The Pan component parameter is explained in the following table.

Parameter	Range	Description
Pan	L63-CENTER-R63	Pans the input signal between the left and right outputs



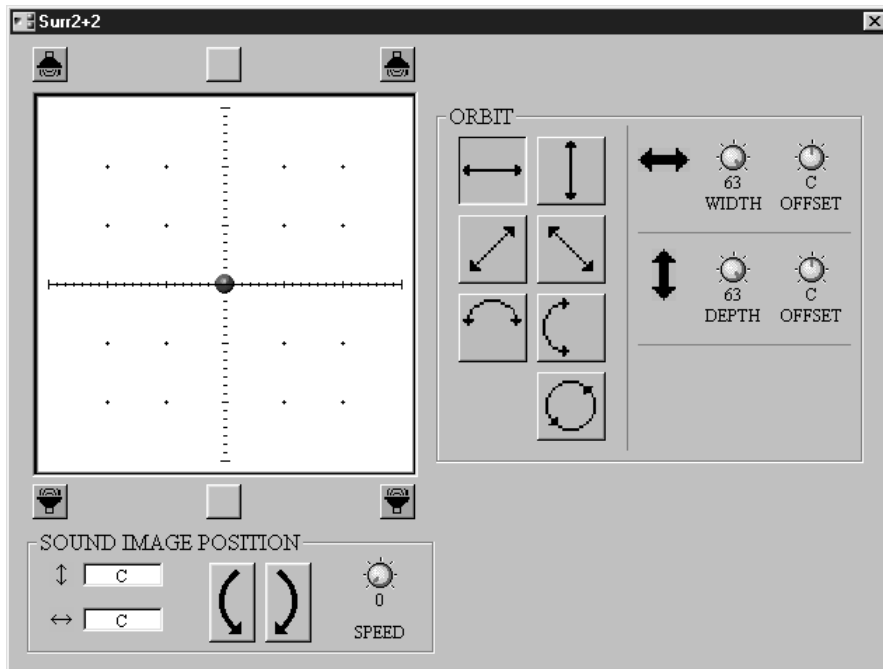
## Surround 2+2

The Surround 2+2 component offers four-channel surround panning, with two front and two rear channels, as shown here.



The Surround 2+2 component features one input and four outputs: FL (front-left), FR (front-right), RL (rear-left), and RR (rear right).

The Surround 2+2 control window consists of speaker buttons, ORBIT section, SOUND IMAGE POSITION section, and a two-dimensional surround pan graph, which displays the specified orbit and sound-image position.



Once an orbit has been selected and the WIDTH and DEPTH controls set, the sound image can be moved along the selected orbit in either direction by clicking the SOUND IMAGE POSITION buttons. Continuous movement is possible by holding down the mouse button, and the speed can be set using the SPEED control. The two values next to these buttons indicate the exact position of the sound image.

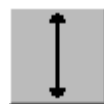
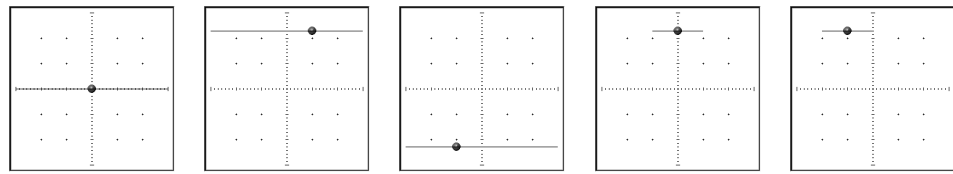


The sound image can be moved directly to a position by clicking within the surround pan graph, or directly to one of the six buttons along the front and rear edges of the graph. Buttons with speaker icons represent the components outputs.

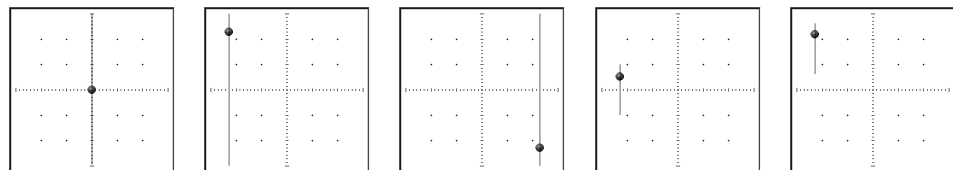
Section	Parameter	Range	Description
ORBIT	Orbit buttons	See the following explanations	Selects an orbit for sound-image movement
	WIDTH	0-63/L63-C-R63	Adjusts the width of the orbit
	X OFFSET	L63-C-R63	Adjusts the X (left-right) position of the orbit
	DEPTH	0-63/F63-C-R63	Adjusts the depth of the orbit
	Y OFFSET	F63-C-R63	Adjusts the Y (front-rear) position of the orbit
SOUND IMAGE POSITION	SPEED	0-10	Sets the continuous movement speed



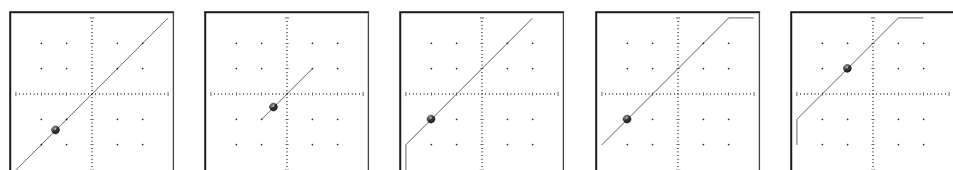
**Left/right**—This orbit moves the sound image along a straight line between left and right. The WIDTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.



**Front/rear**—This orbit moves the sound image along a straight line between front and rear. The DEPTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.

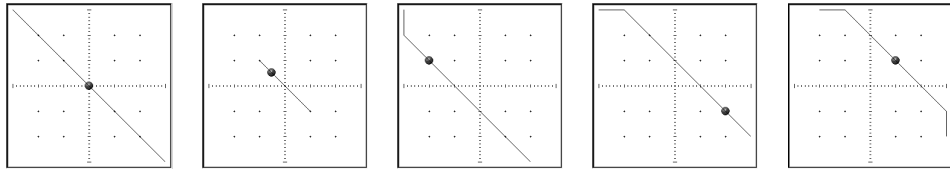


**Rear-left/front-right diagonal**—This orbit moves the sound image diagonally between rear-left and front-right. The WIDTH, DEPTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.

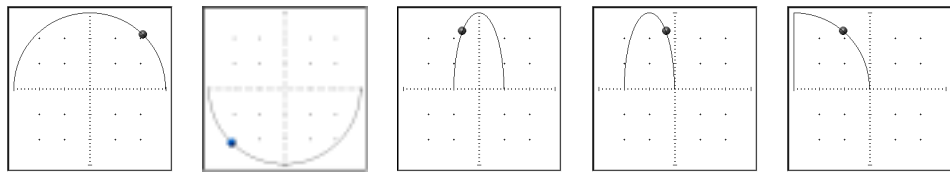




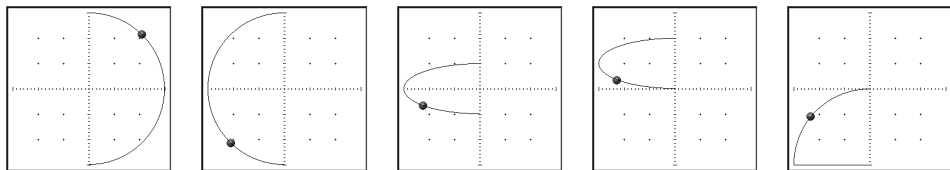
**Front-left/rear-right diagonal**—This orbit moves the sound image diagonally between front-left and rear-right. The WIDTH, DEPTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.



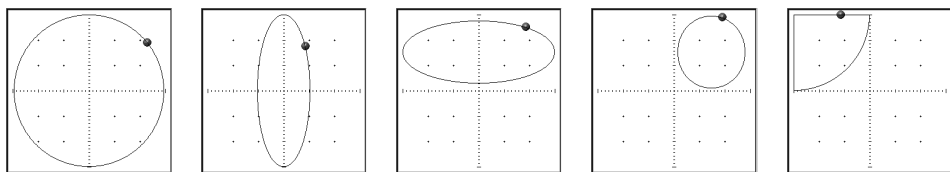
**Left/right curve**—This orbit moves the sound image circularly between left and right. The WIDTH, DEPTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.



**Front/rear curve**—This orbit moves the sound image circularly between front and rear. The WIDTH, DEPTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.

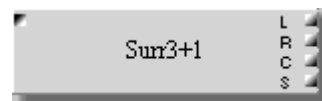
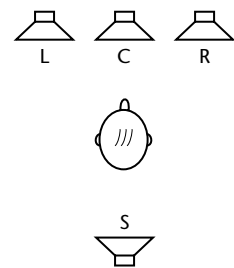


**Circle**—This orbit moves the sound image circularly. The WIDTH, DEPTH, X OFFSET, and Y OFFSET parameters can be used to adjust this orbit, as shown below.



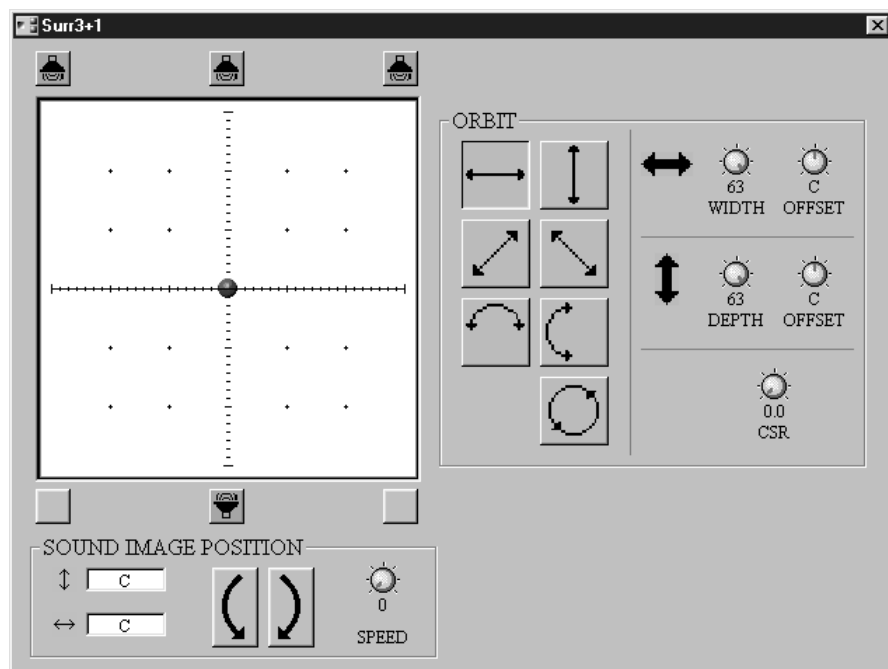
## Surround 3+1

The Surround 3+1 component offers four-channel surround panning, with three front channels and one surround channel, as shown below.



The Surround 3+1 component features one input and four outputs: L (left), C (center), R (right), and S (surround).

The Surround 3+1 control window consists of speaker buttons, ORBIT section, SOUND IMAGE POSITION section, and a two-dimensional surround pan graph, which displays the specified orbit and sound-image position.



Once an orbit has been selected and the WIDTH and DEPTH controls set, the sound image can be moved along the selected orbit in either direction by clicking the SOUND IMAGE POSITION buttons. Continuous movement is possible by holding down the mouse button, and the speed can be set using the SPEED control. The two values next to these buttons indicate the exact position of the sound image.



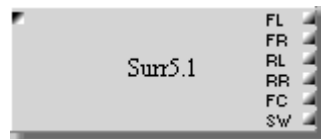
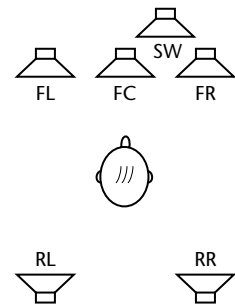
The sound image can be moved directly to a position by clicking within the surround pan graph, or directly to one of the six buttons along the front and rear edges of the graph. Buttons with speaker icons represent the components outputs.

Section	Parameter	Range	Description
ORBIT	Orbit buttons	See page 180 for information on the orbits	Selects an orbit for sound-image movement
	WIDTH	0–63/L63–C–R63	Adjusts the width of the orbit
	X OFFSET	L63–C–R63	Adjusts the X (left-right) position of the orbit
	DEPTH	0–63/F63–C–R63	Adjusts the depth of the orbit
	Y OFFSET	F63–C–R63	Adjusts the Y (front-rear) position of the orbit
	CSR	0.0–1.0	Adjusts the amount of front-center signal fed to the L, R, and C outputs.
SOUND IMAGE POSITION	SPEED	0–10	Sets the continuous movement speed

When the CSR (center-side ratio) control is set to 0, the front-center signal is fed only to the L and R outputs. When it's set to 0.5, the front-center signal is fed equally to the L, R, and C outputs. And when it's set to 1.0, the front-center signal is fed only to the C output.

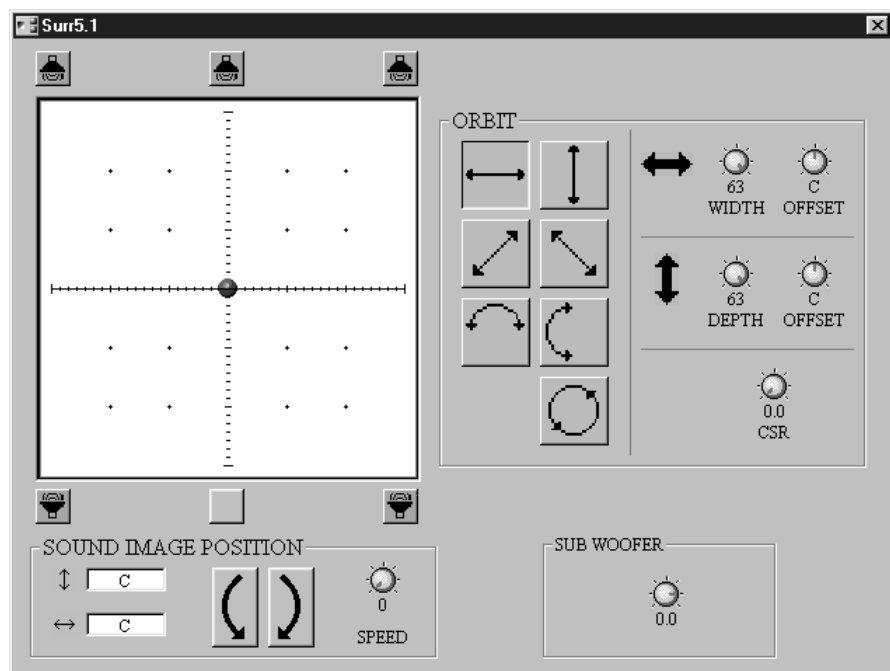
## Surround 5.1

The Surround 5.1 component offers six-channel surround panning, with three front channels, two rear channels, and a subwoofer channel, as shown here.



The Surround 5.1 component features one input and six outputs: FL (front-left), FC (front-center), FR (front-right), RL (rear-left), RR (rear-right), and SW (subwoofer).

The Surround 5.1 control window consists of speaker buttons, ORBIT section, SOUND IMAGE POSITION section, SUB WOOFER section, and a two-dimensional surround pan graph, which displays the specified orbit and sound-image position.



Once an orbit has been selected and the WIDTH and DEPTH controls set, the sound image can be moved along the selected orbit in either direction by clicking the SOUND IMAGE POSITION buttons. Continuous movement is possible by holding down the mouse button, and the speed can be set using the SPEED control. The two values next to these buttons indicate the exact position of the sound image.



The sound image can be moved directly to a position by clicking within the surround pan graph, or directly to one of the six buttons along the front and rear edges of the graph. Buttons with speaker icons represent the components outputs.

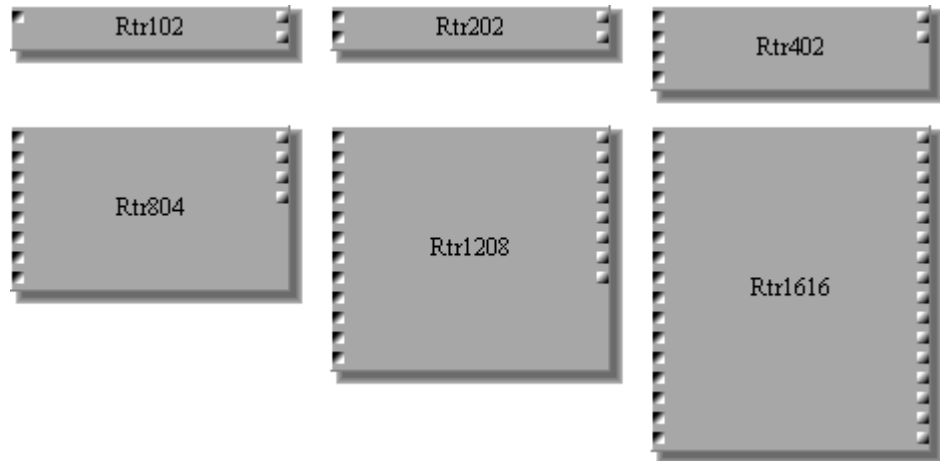
Section	Parameter	Range	Description
ORBIT	Orbit buttons	See page 180 for information on the orbits	Selects an orbit for sound-image movement
	WIDTH	0–63/L63–C–R63	Adjusts the width of the orbit
	X OFFSET	L63–C–R63	Adjusts the X (left-right) position of the orbit
	DEPTH	0–63/F63–C–R63	Adjusts the depth of the orbit
	Y OFFSET	F63–C–R63	Adjusts the Y (front-rear) position of the orbit
	CSR	0.0–1.0	Adjusts the amount of front-center signal fed to the L, R, and C outputs.
SUB WOOFER	Level	–Inf dB to 6.0 dB	Adjusts the level of the subwoofer signal
SOUND IMAGE POSITION	SPEED	0–10	Sets the continuous movement speed

When the CSR (center-side ratio) control is set to 0, the front-center signal is fed only to the L and R outputs. When it's set to 0.5, the front-center signal is fed equally to the L, R, and C outputs. And when it's set to 1.0, the front-center signal is fed only to the C output.

## Router

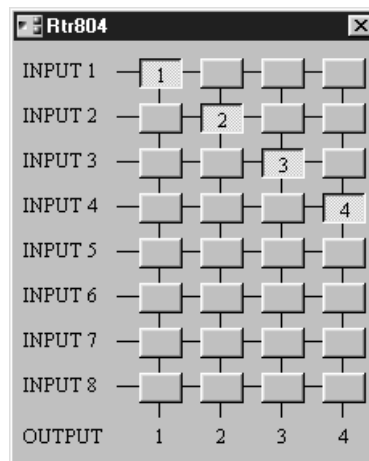
The 35 Router components are organized by number of inputs into six groups: 1x, 2x, 4x, 8x, 12x, and 16x. The 1x input group contains five components, with x2, x4, x8, x12, and x16 outputs. All the other groups contain six components, with x1, x2, x4, x8, x12, and x16 outputs.

A Router component from each group is shown below.



Since the only difference between all the Router components is the number of inputs and outputs, only the 8x4 Router control window is shown here.

Each Router control window features a grid of routing buttons, which are used to assign inputs to outputs. By default, each input is already assigned to its corresponding output. Input 1, for example, is assigned to output 1, and so on.



An input can be assigned to several outputs, but several inputs cannot be assigned to the same output. In other words, a Router can distribute an input signal among several outputs, but it cannot mix input signals.

If you assign an input signal to an output that is already in use, the previous assignment is cancelled.

Router component buttons cannot be linked using the Parameter Link function.

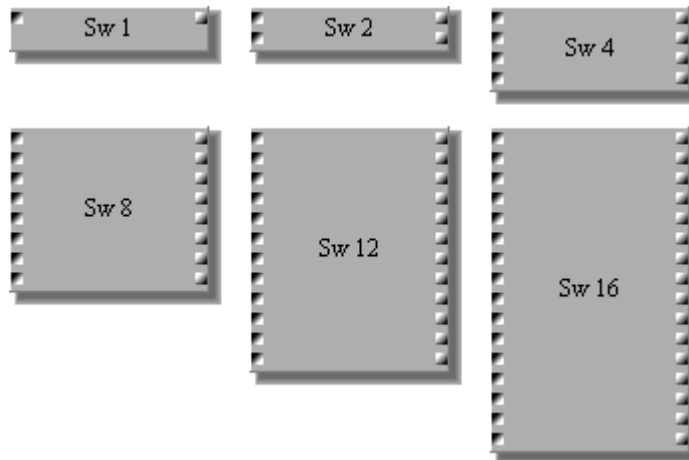


The following Routers are available.

Group	Router	Inputs	Outputs
1x	1x2	1	2
	1x4		4
	1x8		8
	1x12		12
	1x16		16
2x	2x1	2	1
	2x2		2
	2x4		4
	2x8		8
	2x12		12
	2x16		16
4x	4x1	4	1
	4x2		2
	4x4		4
	4x8		8
	4x12		12
	4x16		16
8x	8x1	8	1
	8x2		2
	8x4		4
	8x8		8
	8x12		12
	8x16		16
12x	12x1	12	1
	12x2		2
	12x4		4
	12x8		8
	12x12		12
	12x16		16
16x	16x1	16	1
	16x2		2
	16x4		4
	16x8		8
	16x12		12
	16x16		16

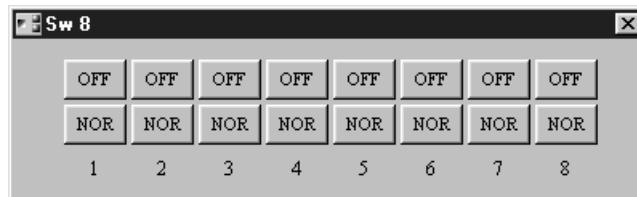
## Switch

There are six components in the Switch group, with 1, 2, 4, 8, 12, and 16 channel versions. Each channel features one input, one output, and on/off and phase buttons.



Since the only difference between all the Switch components is the number of channels, only the 8-channel Switch window is shown here.

Each Switch control window features on/off and phase buttons.



The Switch component parameters are explained in the following table.

Parameter	Range	Description
ON/OFF	ON/OFF	Turns on and off the output of each channel
Phase	NOR/REV	Invert the phase of each input signal

## User Control

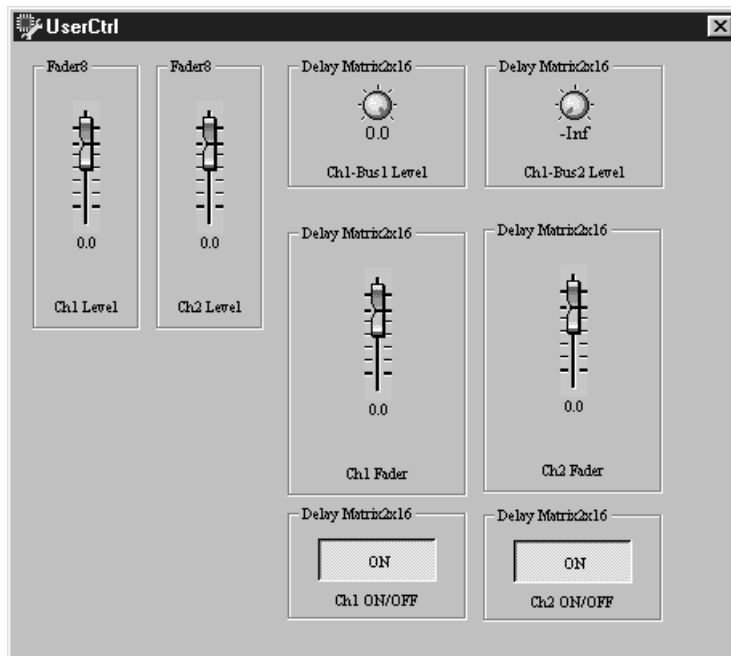
User Controls allow you to build custom control windows by copying frequently used rotary controls, sliders, and buttons from other components in the configuration, providing a convenient way to control several parameters from a single control window.

User Controls can also be used to build simple interfaces for complex systems, allowing system designers to decide which component parameters are available to non-technical users. For example, individual parameters that need to be accessed by non-technical users can be copied to a User Control control window. Access to other component parameters can then be prevented by turning on the password protection for these components.



The User Control component has no inputs or outputs.

The following example shows a User Control control window featuring parameters copied from various components.



## Building User Controls

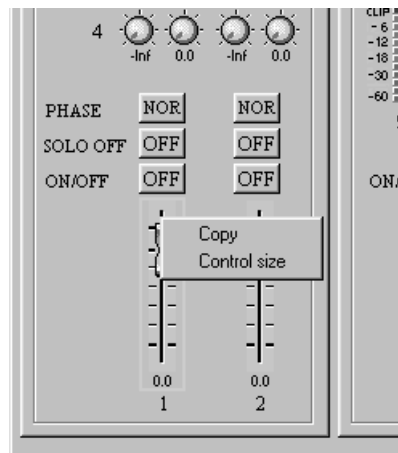
- 1 Select Edit mode.  
See “Selecting Edit Mode” on page 45.
- 2 Add the User Control to the configuration from the Component menu or Component List and double-click it.

The User Control control window opens, as shown below.

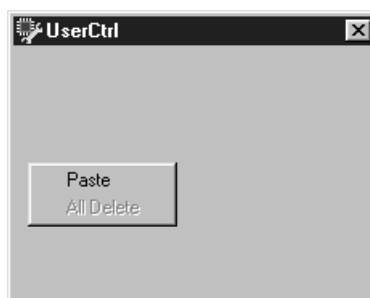


- 3 Open the component control window containing the parameter that you want to add to the User Control control window.
- 4 Select the parameter, then while holding down the Shift key, right-click over the control.

The following pop-up menu appears.

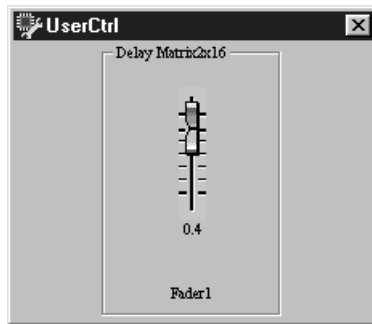


- 5 Choose Copy.  
The pop-up menu disappears.
- 6 Select the User Control window, and right-click over it.  
The following pop-up menu appears.



## 7 Choose Paste.

The copied parameter appears on the control window, as shown below.

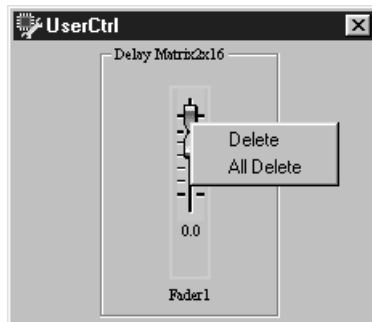


Drag the parameter by its border to position it within the control window.

## 8 Repeat steps 3 to 7 to copy other parameters to the User Control window.

## 9 To delete a control, select it, then while holding down the Shift key, right-click over the control.

The following pop-up menu appears.



## 10 Choose Delete to delete the selected control, or select All Delete to delete all controls.

The selected control, or all controls are deleted.

User controls are stored in configurations, and once completed, it's a good idea to store the configuration. You must compile and transfer the configuration to the DME32 for the user control to take effect.

When a parameter on the User Control is adjusted, the corresponding parameter on the source component is also adjusted and vice versa. If both parameter controls are visible on-screen, you can see both of them move as either control is adjusted.

Parameters on a User Control control window can be adjusted even when the source component is password protected. See "Using Password Protection" on page 83 for more information. Components can be protected individually using the Protect option on the Properties window. See "Customizing Component Properties" on page 80 for more information.

## User Module

User Modules allow you to build custom components, using the library of components as building blocks, and providing a convenient way to manage frequently used component combinations. User Modules are reusable and can be titled and saved to disk.

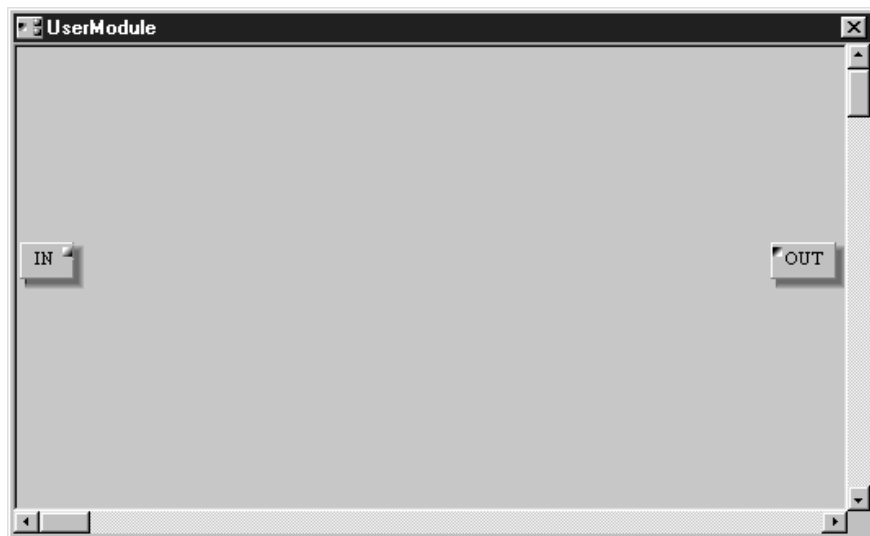


Initially a User Module features one input and one output, although this can be expanded to up to 16 inputs and 16 outputs.

### Building User Modules

- 1 Select Edit mode.  
See “Selecting Edit Mode” on page 45.
- 2 Add the User Module to the configuration from the Component menu or Component List and double-click it.

The User Module window opens, as shown below.



Initially the User Module window features one input and one output. This can be expanded to up to 16 inputs and 16 outputs from the Properties window. See “Customizing Component Properties” on page 80 for more information.

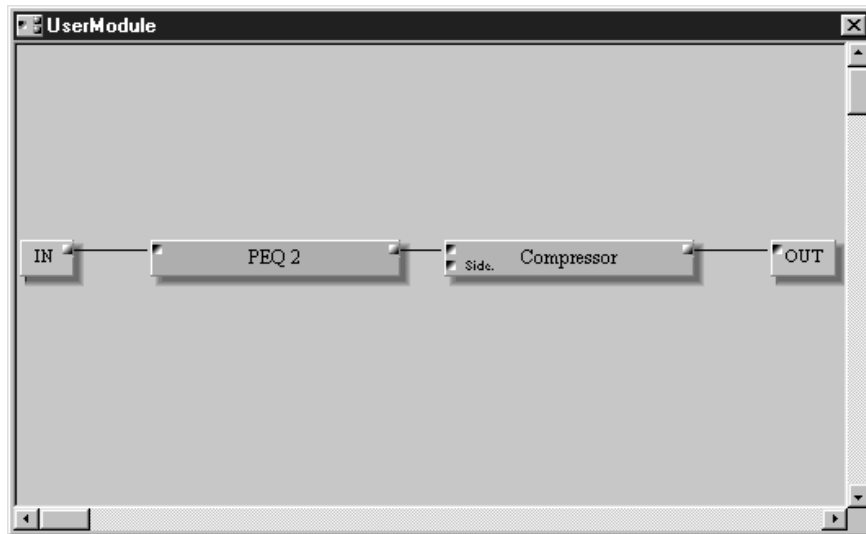
- 3 Add the necessary components to the User Module window from the Component menu or Component List.

The DSP power meter rises as components are added, and components can be positioned in the User Module window using the Grid and Align functions, just like working with components in a configuration window. See “Adding Components” on page 47 for more information. Components in a User Module window can be edited just like those in a configuration window. See “Editing Components” on page 48 for more information.

- 4 Select Cable mode and wire the components together.

Components in a User Module window can be wired together just like components in a configuration window. See “Adding Wires” on page 51 and “Deleting Wires” on page 56 for more information.

The following example shows a basic User Module.



Once you've added the necessary components and wired them together, the User Module window can be closed. The User Module can then be wired to the other components in the configuration window.

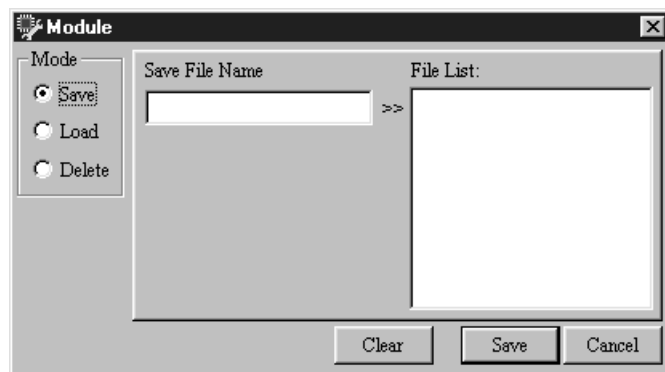
## Saving User Modules

User Modules can be saved as follows.

- 1 Select the User Module component that you want to save.
- 2 Choose Module from the Edit menu.

Alternatively, choose Module from the Shortcut menu.

The Module window appears, as shown below.



- 3 In the Mode section, select Save.
- 4 In the Save File Name field, enter a title for the User Module.  
Titles can be up to 24 characters long.  
Click the Clear button to clear the title if you want to enter another title.
- 5 Click Save.  
The User Module is saved and the Module window closes.

If a module with the same title already exists, an overwrite confirmation message appears. Click OK to overwrite and proceed with the save, or click Cancel to cancel the operation.

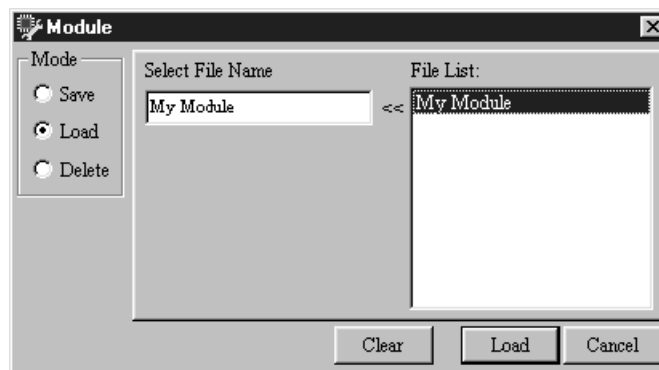
User Modules are saved with a “um” file extension in the Module folder, which is located inside the DME Manager program folder. User Module files can be managed (e.g., copied, deleted, backed up, etc.) just like any Windows file.

## Loading User Modules

Previously saved User Modules can be loaded as follows.

- 1 Select the User Module component to which you want to load the saved User Module.
- 2 Choose Module from the Edit menu.  
Alternatively, choose Module from the Shortcut menu.  
The Module window appears.
- 3 In the Mode section, select Load.
- 4 Select the module that you want to load from the File List.

The title of the selected module appears in the Select File Name field, as shown below.



Click the Clear button to cancel the selection if you want to select another module.

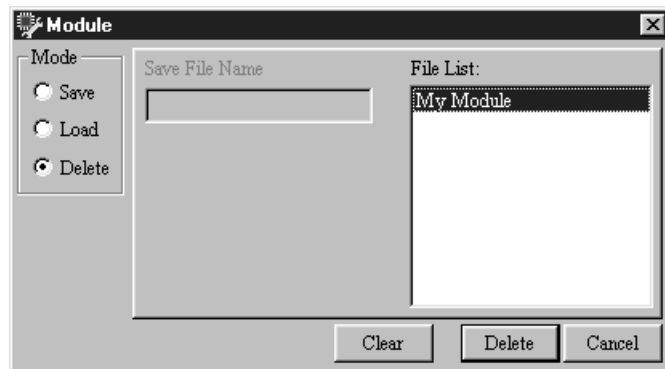
- 5 Click Load.  
The selected module is loaded and the Module window closes.



## Deleting User Modules

Previously saved User Module files can be deleted as follows.

- 1 Select a User Module.  
The Delete function does not affect User Modules used in the configuration.
- 2 Choose Module from the Edit menu.  
Alternatively, choose Module from the Shortcut menu.  
The Module window appears.
- 3 In the Mode section, select Delete.
- 4 Select the module that you want to delete from the File List, as shown below.



Click the Clear button to cancel your selection if you want to select another module.

- 5 Click Delete.  
The selected module is deleted.

---

# Front Panel Operation

---

# 10

## In this chapter...

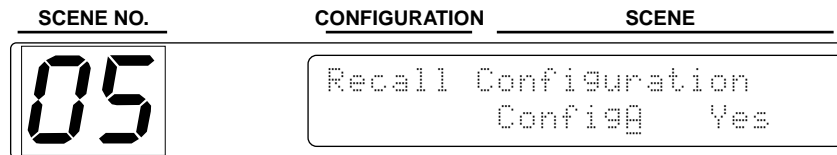
Recalling Configurations .....	198
Storing Scenes .....	199
Recalling Scenes .....	200
Editing Parameters & the User Define Button .....	201
Restricting Access to the DME32 .....	203
Selecting the Wordclock Source .....	209
Checking the I/O Slots .....	210
Initializing the DME32 .....	210
Checking the Firmware Version & Battery .....	210

## Recalling Configurations

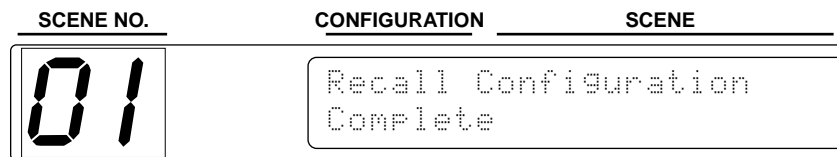
Configurations can be recalled from the DME32 front panel as follows.

*Note: When recalling a configuration, be aware that volume levels may change abruptly as the system is reconfigured—nobody likes sudden loud noises, or worse, speaker damage.*

- 1 Use the [UTILITY] button to select the “Recall Configuration” function.  
The UTILITY indicator lights up.



- 2 Use the DATA wheel or [INC] and [DEC] buttons to select configuration A or B.  
Only configuration memories that contain data can be selected.
- 3 Press the [VALUE] button to recall the configuration.  
The configuration is recalled, the last recalled scene of that configuration is recalled, and the message “Complete” appears on the display, as shown below.



- 4 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.  
In a multiple-unit system, the selected configuration is recalled on all DME32s via the cascade connections.

## Storing Scenes

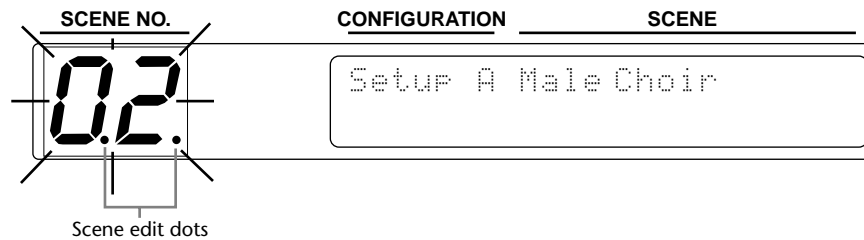
Scenes can be stored from the DME32 front panel as follows.

*Note: When storing a scene, make sure that there are no settings that you do not want to store. Perhaps some settings have been adjusted accidentally, or by someone else. If you are not sure, recall the last scene, make the adjustments that you really want, and then store the scene. You may want to store the current settings to an unused scene memory just in case you need to return to them later.*

All new configurations are created with a Default Scene in scene memory 01. Initially, this scene contains the component parameter's initial values, but it can be edited, titled, stored, and recalled just like the other scenes, although it cannot be deleted.

- 1 Use the number keypad to enter a scene memory number.

The number of the specified scene memory flashes on the SCENE NO. display and the scene title appears on the main display, as shown in the following example.

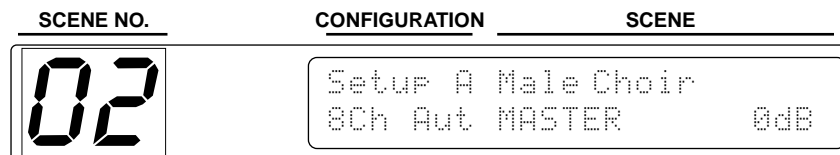


If the specified memory does not contain a scene, "NO DATA" appears.

To cancel the Store function and stop the scene memory number flashing, enter the previous scene number.

- 2 Press the [STORE] button.

The current settings are stored to the specified scene memory, the number on the SCENE NO. display stops flashing, the scene edit dots go out, and the VALUE section of the display is updated accordingly, as shown in the following example.



The newly stored scene inherits the title of the scene that was recalled last.

In a multiple-unit system, the specified scene is stored on all DME32s via the cascade connections.

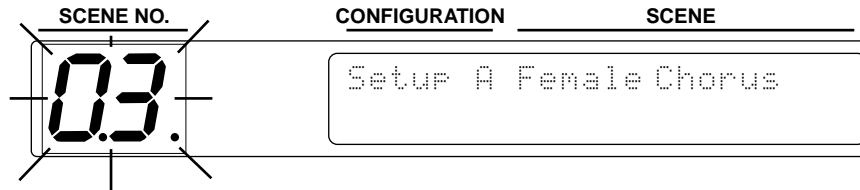
## Recalling Scenes

Scenes can be recalled from the DME32 front panel as follows.

*Note: When recalling a scene, be aware that volume levels may change abruptly as parameters change—nobody likes sudden loud noises, or worse, speaker damage.*

- 1 Use the number keypad to enter a scene memory number.

The number of the specified scene memory flashes on the SCENE NO. display and the scene title appears on the main display, as shown in the following example.

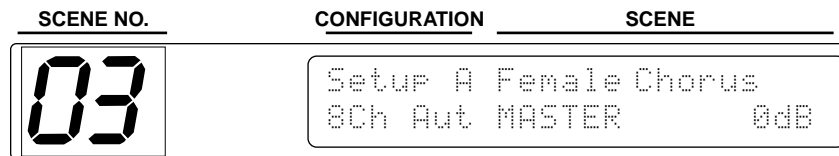


If the specified memory does not contain a scene, “NO DATA” appears.

To cancel the Recall function and stop the scene memory number flashing, enter the previous scene number.

- 2 Press the [RECALL] button.

The specified scene is recalled, the number on the SCENE NO. display stops flashing, the scene edit dots go out, and the VALUE section of the display is updated accordingly, as shown in the following example.



In a multiple-unit system, the specified scene is recalled on all DME32s via the cascade connections.

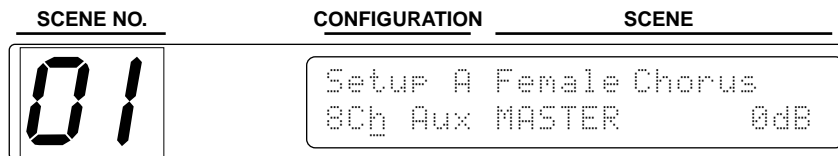
## Editing Parameters & the User Define Button

There are three steps to editing component parameters from the front panel: 1) selecting the component, 2) selecting the parameter, and 3) editing its value.

Direct access to a specific parameter is possible using the [USER DEFINE] button, which is configured from DME Manager. See “Assigning the User Define Button” on page 86.

- 1 Press the [COMPONENT] button.

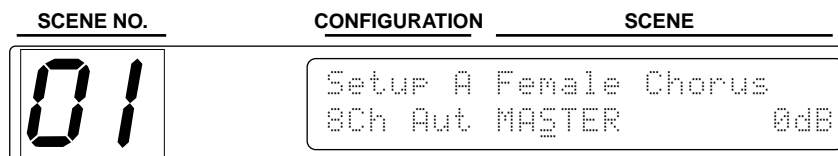
The cursor moves to the COMPONENT section of the display, as shown in the following example, and the COMPONENT indicator lights up.



Normally only the first seven characters of a component's title are displayed. Pressing the [COMPONENT] button displays the full title by using the PARAMETER section of the display. Press the button again to return to the normal display.

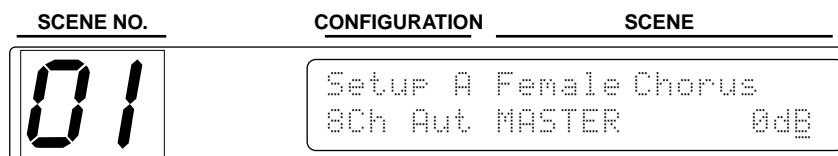
- 2 Use the DATA wheel or [INC] and [DEC] buttons to select a component.
- 3 Press the [PARAMETER] button.

The cursor moves to the PARAMETER section of the display, as shown in the following example, and the PARAMETER indicator lights up.



- 4 Use the DATA wheel or [INC] and [DEC] buttons to select a parameter.
- 5 Press the [VALUE] button.

The cursor moves to the VALUE section of the display, as shown in the following example, and the VALUE indicator lights up.



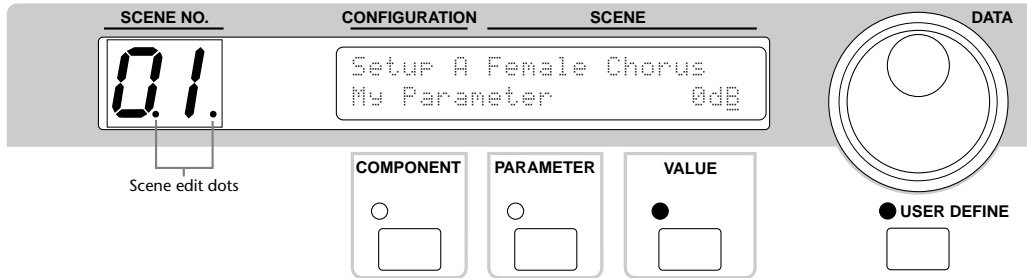
- 6 Use the DATA wheel or [INC] and [DEC] buttons to edit the value.

As an alternative to the [COMPONENT], [PARAMETER], and [VALUE] buttons, you can use the cursor buttons (◀ / ▶) to move the cursor between the COMPONENT, PARAMETER, and VALUE sections of the display.

When a parameter is edited, the scene edit dots appear on the SCENE NO. display, indicating that a parameter has been edited since the last scene was recalled.

When the DME32 is turned on, or a scene recalled, the first parameter of the first component is selected, unless the [USER DEFINE] button has been assigned to a parameter, in which case, that parameter is selected.

When the [USER DEFINE] button is pressed, the assigned parameter is selected, text specified by LCD Disp appears in the COMPONENT and PARAMETER sections of the display, the cursor moves to the VALUE section, and the VALUE and USER DEFINE indicators light up, as shown below.



Parameters assigned to the [USER DEFINE] button can be edited in the normal way using the DATA wheel or [INC] and [DEC] buttons.

Other parameters can be edited in the normal way using the [COMPONENT], [PARAMETER], and [VALUE] buttons. To return directly to the assigned parameter, simply press the [USER DEFINE] button again.

The cursor buttons (◀ / ▶) are ineffective while the [USER DEFINE] indicator is lit.

## Restricting Access to the DME32

Access to the DME32 can be restricted by using the Protect function. Two levels of protection are available: Scene Recall Only and Full Protect. Scene Recall Only allows scenes to be recalled while preventing access to all other functions. Full Protect prevents access to all functions, although it can be disabled temporarily by entering the correct password, allowing editing by authorized users. See “Temporarily Disabling the Protection System” on page 206 for more information.

In a multiple-unit system, protection functions need only be set on DME32 #1, as the other DME32s are set accordingly via the cascade connections.

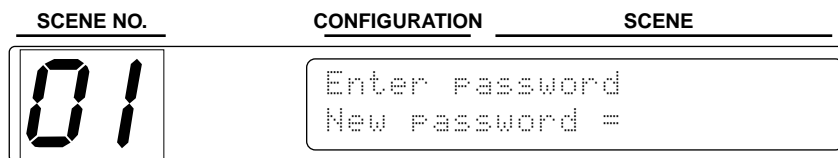
Note that this protection function is not the same as the protection functions offered by DME Manager, which are explained on page 83.

### Setting the Password

This procedure explains how to set the password for the first time, or after the DME32 has been initialized. To change or delete a password that has already been set, see page 207 and page 208, respectively.

- 1 Press the [PROTECT] button.

The following display appears and the PROTECT indicator lights up.



- 2 Use the SCENE RECALL number keypad to enter a 4-digit password.

If you enter an incorrect digit, press the [PROTECT] button to start again. Note that if you press the [RECALL] button after four digits have been entered, the password will be set.

To cancel the Protect function and not set the password, press the [PROTECT] button. The Protect function is cancelled and the PROTECT indicator goes out.

- 3 When you've entered all four digits, press the [RECALL] button to set the password.

The password is set and the protection system is enabled.

### Forgotten Password?

If you forget the password, see “Checking the Firmware Version & Battery” on page 210.

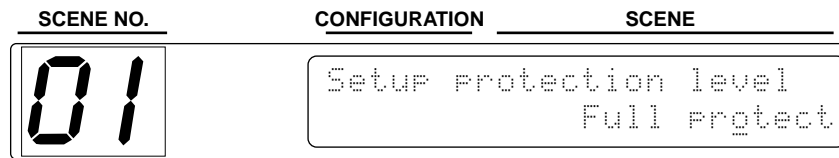


## Using Scene Recall Only

Scene Recall Only allows scenes to be recalled but prevents access to other functions.

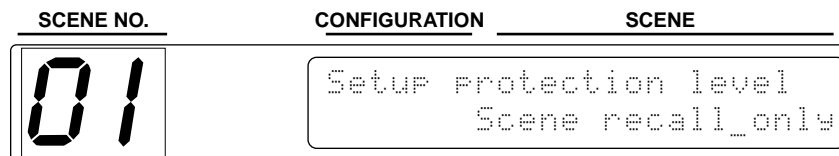
- 1 Use the [UTILITY] button to select the “Setup protection level” function, as shown below.

The UTILITY indicator lights up.



Note that if Full Protect mode is enabled, you won't be able to select the “Setup protection level” function until you disable the protection. To do this, press the [PROTECT] button, enter the correct password, and then press the [RECALL] button.

- 2 Use the DATA wheel or [INC] and [DEC] buttons to select “Scene recall only,” as shown below.



The PROTECT indicator lights up.

- 3 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.

In Scene Recall Only mode, scenes can be recalled as normal, but scenes cannot be stored. Components, parameters, and values can be selected and viewed in the normal way, but parameters cannot be edited.

Only three utility displays are available in Scene Recall Only mode: the main display, the Setup protection level display, and the SLOT display.

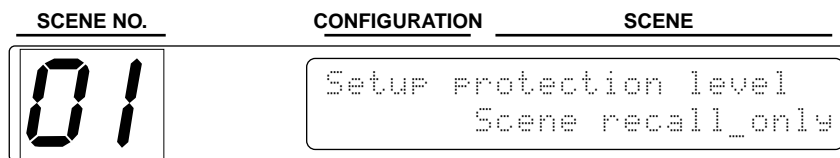
If Scene Recall Only mode is enabled and you want to edit component parameters, first switch to Full Protect mode (see page 205), and then temporarily disable the protection (see page 206).

## Using Full Protect

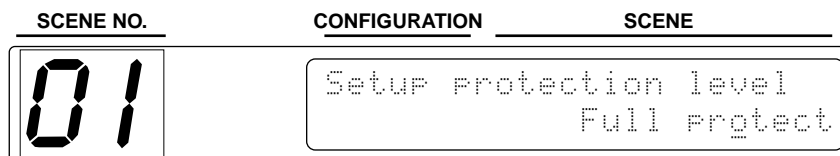
Full Protect prevents access to all functions. It can be disabled temporarily by entering the correct password, allowing editing by authorized users. See “Temporarily Disabling the Protection System” on page 206 for more information.

- 1 Use the [UTILITY] button to select the “Setup protection level” function, as shown below.

The UTILITY indicator lights up.



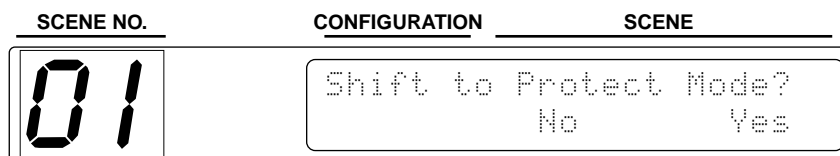
- 2 Use the DATA wheel or [INC] and [DEC] buttons to select “Full protect,” as shown below.



The PROTECT indicator goes out.

- 3 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.
- 4 Press the [PROTECT] button.

The Shift to Protect Mode display appears, as shown below.



- 5 Press the [VALUE] button to enable Full Protect mode, or press the [PARAMETER] button to cancel.

Full Protect mode is enabled and the PROTECT indicator lights up.

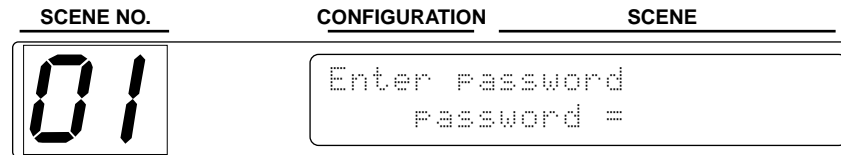
In Full protect mode, scenes cannot be stored or recalled. Components, parameters, and values can be selected and viewed in the normal way, but they cannot be edited.

## Temporarily Disabling the Protection System

The protection system can be temporarily disabled to allow editing by authorized users.

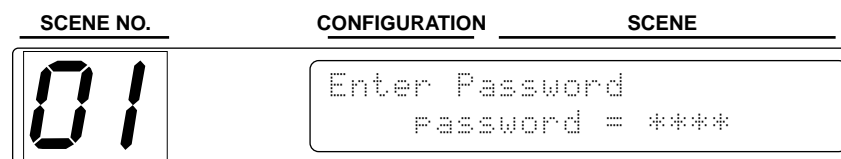
- 1 Press the [PROTECT] button.

The Enter password display appears, as shown below.



- 2 Use the SCENE RECALL number keypad to enter the password.

An asterisk appears as each number is entered, as shown below.



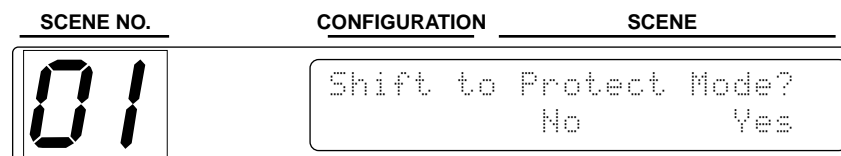
- 3 Press the [RECALL] button.

If the correct password is entered, the protection is disabled and the PROTECT indicator goes out. If the password is incorrect, the Change password display appears. Press the [VALUE] button to cancel this display.

While the protection system is temporarily disabled, scenes can be stored and recalled and parameters can be edited as normal.

- 4 To turn the protection system back on again, press the [PROTECT] button.

The Shift to Protect Mode display appears, as shown below.



- 5 Press the [VALUE] button to enable Full Protect mode, or press the [PARAMETER] button to cancel.

Full Protect mode is enabled and the PROTECT indicator lights up.

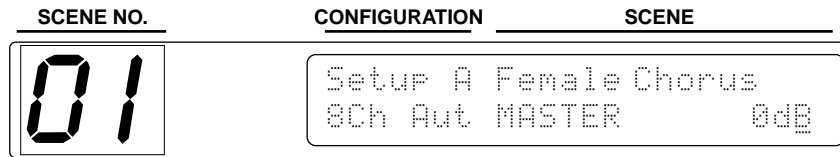
If you forget the password, see “Checking the Firmware Version & Battery” on page 210.

## Changing the Password

The set password can be changed as follows.

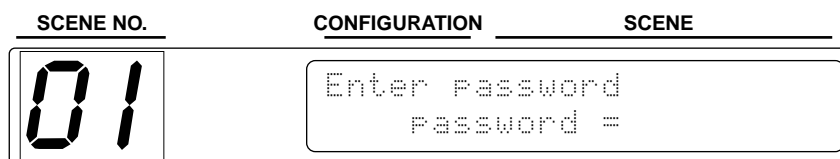
- 1 Select a component, parameter, and value.

The cursor must be in the VALUE section of the display, as shown below.



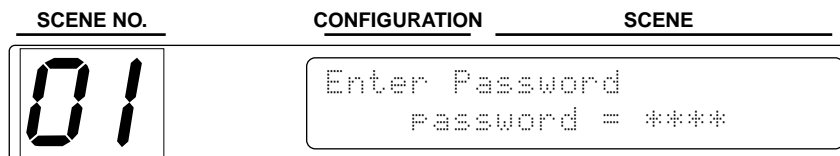
- 2 Adjust the DATA wheel or press the [INC] or [DEC] button.

The Enter password display appears, as shown below.



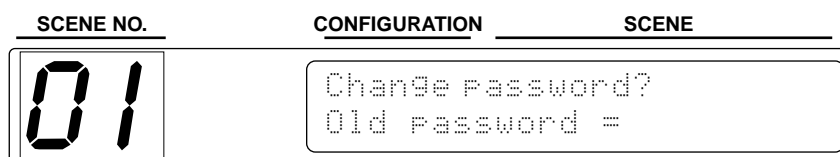
- 3 Enter an incorrect password.

An asterisk appears as each number is entered, as shown below.



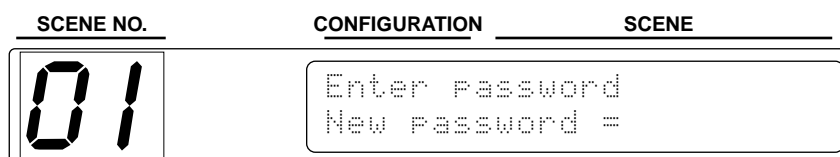
- 4 Press the [RECALL] button.

The Change password display appears, as shown below.



- 5 Enter the old password, and then press the [RECALL] button.

The New password display appears, as shown below.



- 6 Enter the new password, and then press the [RECALL] button.

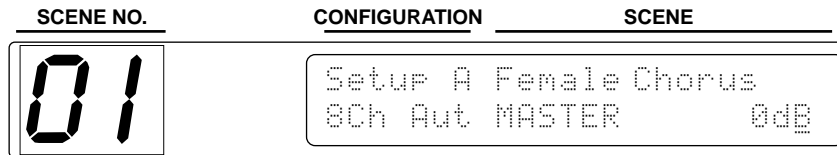
The new password is set.

## Deleting the Password

The set password can be deleted as follows.

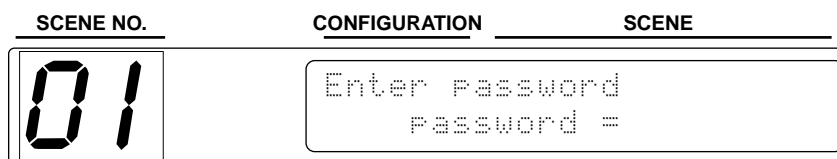
- 1 Select a component, parameter, and value.

The cursor must be in the VALUE section of the display, as shown below.



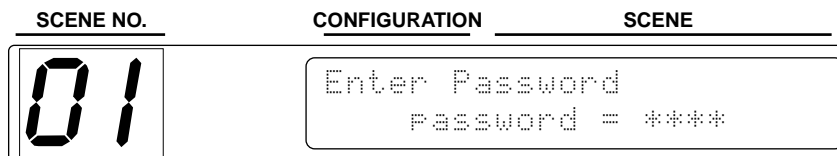
- 2 Adjust the DATA wheel or press the [INC] or [DEC] button.

The Enter password display appears, as shown below.



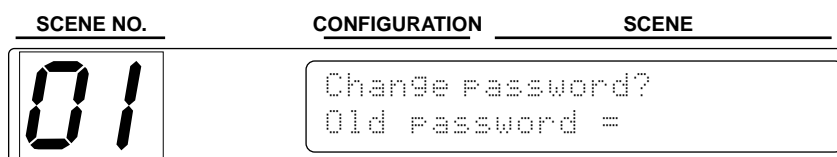
- 3 Enter an incorrect password.

An asterisk appears as each number is entered, as shown below.



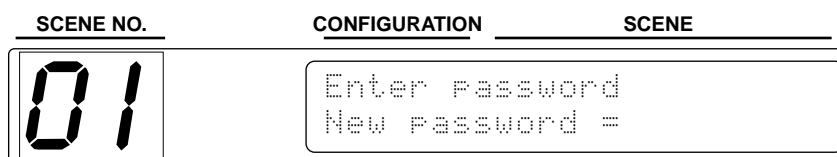
- 4 Press the [RECALL] button.

The Change password display appears, as shown below.



- 5 Enter the old password, and then press the [RECALL] button.

The New password display appears, as shown below.



- 6 Press the [PROTECT] button.

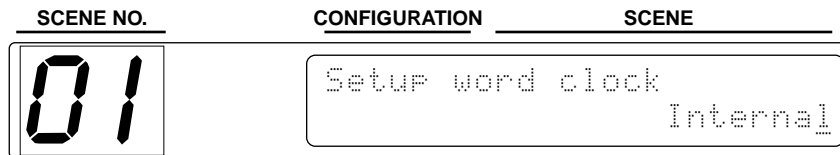
The password is deleted and the PROTECT indicator goes out.

## Selecting the Wordclock Source

In addition to using DME Manager, as explained on page 229, the wordclock source can also be set via the front panel. Source settings made from the front panel override those made from DME Manager.

In a multiple-unit system, the wordclock source can be set only on DME32 #1. The other DME32s automatically receive their wordclocks via the cascade connections.

- 1 Use the [UTILITY] button to select the “Setup word clock” function.



- 2 Use the DATA wheel or [INC] and [DEC] buttons to select a wordclock source.

Source	Description
W.Clk In	External wordclock via the BNC WORD CLOCK IN
Internal	Internal 48 kHz wordclock (default setting).
Card1_1	External wordclock via slot 1, input 1/2
Card1_3	External wordclock via slot 1, input 3/4
Card1_5	External wordclock via slot 1, input 5/6
Card1_7	External wordclock via slot 1, input 7/8
Card2_1	External wordclock via slot 2, input 1/2
Card2_3	External wordclock via slot 2, input 3/4
Card2_5	External wordclock via slot 2, input 5/6
Card2_7	External wordclock via slot 2, input 7/8
Card3_1	External wordclock via slot 3, input 1/2
Card3_3	External wordclock via slot 3, input 3/4
Card3_5	External wordclock via slot 3, input 5/6
Card3_7	External wordclock via slot 3, input 7/8
Card4_1	External wordclock via slot 4, input 1/2
Card4_3	External wordclock via slot 4, input 3/4
Card4_5	External wordclock via slot 4, input 5/6
Card4_7	External wordclock via slot 4, input 7/8

The DME32 checks the selected source to see if a usable wordclock signal is available. If such a signal exists, the DME32 locks to it and the LOCK indicator lights up. The 48kHz indicator lights up if the selected wordclock is at 48 kHz; the 44.1kHz indicator lights up if it's at 44.1 kHz. Neither indicator lights up for other wordclock frequencies.

If a usable wordclock signal is not found, the DME32 will not operate and the LOCK indicator does not light up. In this situation, you must either select another wordclock source, or correct the selected external wordclock source. This condition also occurs if an external wordclock source is disconnected or the device supplying it is turned off.

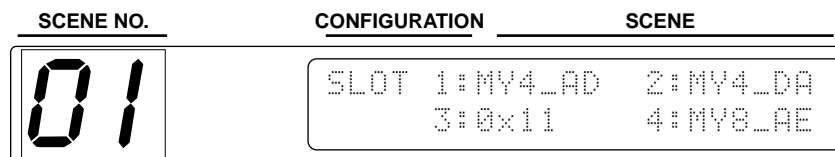
- 3 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.

When using digital I/O cards other than the MY8-AE, the external wordclock is sourced from input 1/2 regardless of which input is selected.

## Checking the I/O Slots

You can check the type of I/O card installed in each slot by using the Slot function.

- 1 Use the [UTILITY] button to select the “Slot” function.



For slots that contain no cards, “0x11” is displayed.

- 2 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.

## Initializing the DME32

You can reset the DME32 to its initial settings as follows.

- 1 Turn off the DME32.
- 2 While holding down the [RECALL] button, turn on the DME32.
- 3 When the Diagnostics display appears, press the [RECALL] button.

The DME32 is initialized.

Initializing the DME32 deletes any previously set password.

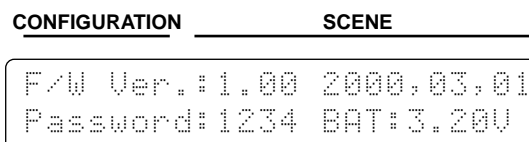
When the number of DME32s in a multiple-unit system is changed (e.g., DME32s are added or removed), all DME32s must be initialized.

## Checking the Firmware Version & Battery

You can check the date and version number of the DME32 firmware and battery voltage as follows.

- 1 Turn off the DME32.
- 2 While holding down the [UTILITY] button, turn on the DME32.

The firmware date and version number, battery voltage, and, if set, password appear on the display, as shown below.



If no password has been set, “----” appears instead.

# GPI Interface

---



## In this chapter...

About the GPI Interface .....	212
GPI Connectors .....	212
Assigning GPI Inputs .....	214
Assigning GPI Outputs .....	217
Emergency Mode .....	220



## About the GPI Interface

The GPI (General Purpose Interface) allows remote interaction between DME32 functions and custom-made controllers and other equipment. The DME32 features 16 GPI inputs and 16 GPI outputs.

GPI inputs can be used to recall scenes and configurations or adjust component parameters. They can also be configured for use with Emergency mode, in which the DME32 mutes all outputs. The DME32 can be configured to switch a GPI output when a GPI input is triggered, or to transmit a Program Change message when a scene or configuration is recalled via a GPI input, or to transmit a Control Change message when a component parameter is adjusted via a GPI input.

GPI outputs can be used to trigger other equipment when scenes are recalled or component parameters are adjusted from DME Manager, front panel controls, GPI inputs, or by using MIDI Program Changes and Control Changes. GPI outputs can be configured so that they switch between high and low when a parameter is adjusted above or below a specified threshold.

In a multiple-unit system, all GPI interfaces can be used, providing a maximum of 64 GPI inputs and 64 GPI outputs with four DME32s.

## GPI Connectors

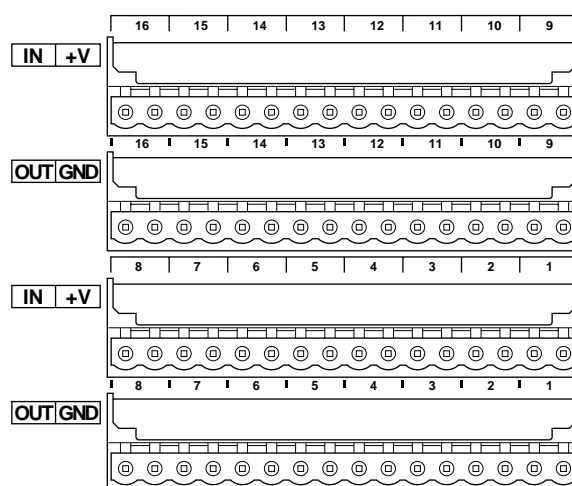
The GPI connectors are 16-pin Euro-block sockets, which mate with 16-pin Euro-block plugs.

The top connector contains the IN terminals for GPI inputs 9 through 16 and +V terminals.

The second connector contains the OUT terminals for GPI outputs 9 through 16 and GND terminals.

The third connector contains the IN terminals for GPI inputs 1 through 8 and +V terminals.

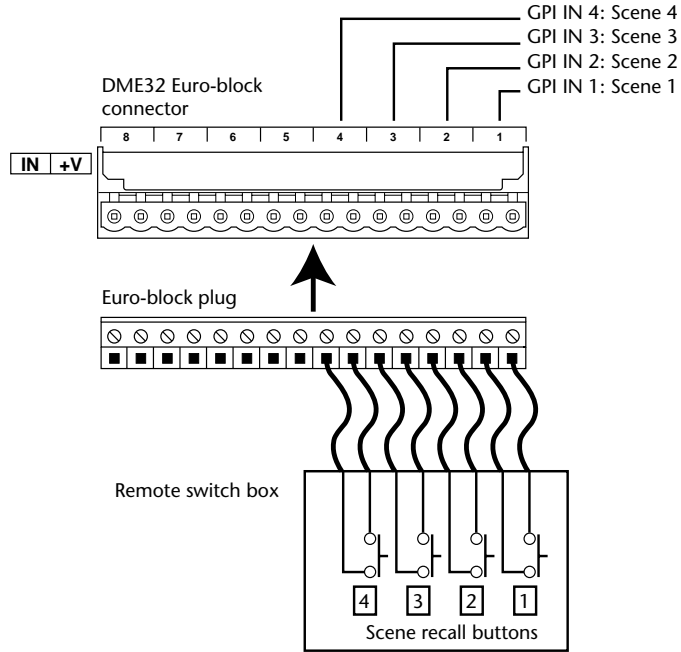
The bottom connector contains the OUT terminals for GPI outputs 1 through 8 and GND terminals.



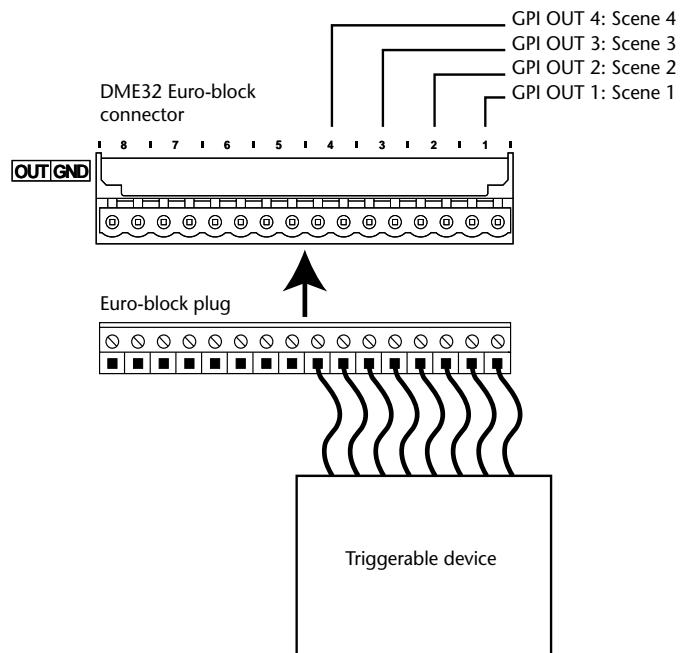
The open terminal voltage of each +V terminal is 15 V and the maximum supply current available from each terminal is 6 mA.

External controllers and other equipment can easily be attached to the GPI interface by using Euro-block plugs. Simply insert the bare wire into the relevant hole and tighten the adjacent screw. To prevent interference, use shielded cable and attach the shield to a GND terminal.

The following example shows just how easily the DME32 can be remotely controlled using the GPI interface and a simple switch box. Scenes 1 through 4 are assigned to GPI inputs 1 through 4. When a button is pressed on the remote switch box, the corresponding scene is recalled. A more advanced setup could be used to remotely control component parameters.



The next example shows how the DME32 can remotely control other equipment via the GPI interface. Scenes 1 through 4 are assigned to GPI outputs 1 through 4. When a scene is recalled, the corresponding GPI output is switched from high or low. A more advanced setup could be used to switch a GPI output when a component parameter is turned on or off, or a parameter is adjusted above or below a specified threshold.



## Assigning GPI Inputs

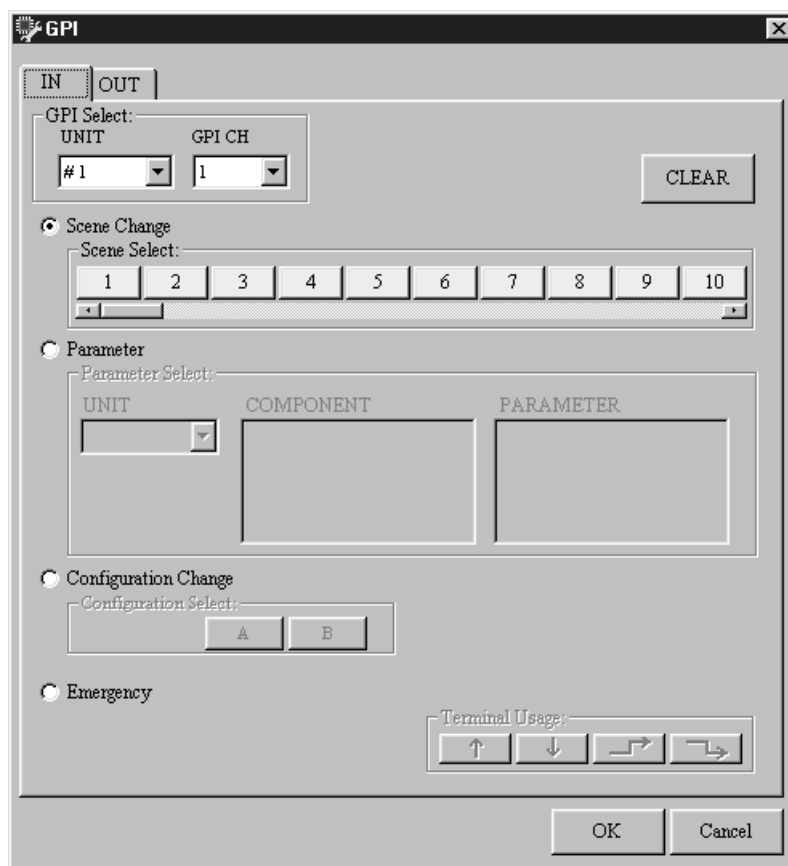
Scenes 1 through 99, configurations A or B, component parameters, or emergency can be assigned to the GPI inputs.

- 1 Choose GPI from the Tool menu.

The GPI window appears.

- 2 Click the IN tab if the IN page is not already shown.





The IN page appears, as shown below.



- 3 Select a DME32 (GPI Select: UNIT) and GPI input (GPI Select: GPI CH).
- 4 To assign a scene, click the Scene Change button, and then click a Scene Select button from 1 through 99. Use the scroll bar to see all the scene buttons.
- 5 To assign a component parameter, click the Parameter button, and then select a DME32 (UNIT), component, and parameter. Then set the Terminal Usage.
- 6 To assign a configuration, click the Configuration Change button, and then click a Configuration Select button, either A or B.
- 7 To assign an input for use with Emergency mode, click the Emergency button. See “Emergency Mode” on page 220 for more information.
- 8 To delete an assignment for the selected GPI input, click CLEAR.
- 9 Click OK to save your settings, or click Cancel to leave them unchanged. The GPI window closes.

You must compile and transfer the configuration to the DME32 for the GPI IN settings to take effect. See “How to Build & Edit Configurations” on page 44 for more information.

The GPI IN parameters are explained in the following table.

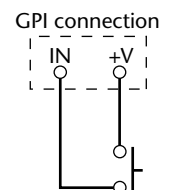
Section	Parameter	Range	Description
GPI Select	UNIT	1–4	Selects a DME32
	GPI CH	1–16	Selects a GPI input
Scene Change	Scene Select	1–99	Assigns a scene to the selected GPI input
Parameter	UNIT	1–4	Selects the DME32 containing the parameter to be assigned
	COMPONENT	1	Selects the component whose parameter is to be assigned
	PARAMETER	2	Selects the parameter to be assigned
Configuration Change	Configuration Select	A, B	Assigns a configuration to the selected GPI input
Emergency			Assigns the selected GPI input for use with Emergency mode
Terminal Usage (for use with Parameters only)		Normal	
		Reverse	
		Low-to-high	
		High-to-low	

1. Components in the current configuration can be selected.
2. Depends on the component selected.

GPI settings are stored in configurations.

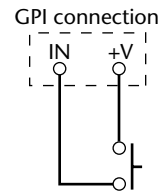
## Scene & Configuration Recall

This connection diagram shows how a normally open switch can be used to recall scenes and configurations. The assigned scene or configuration is recalled when the button is pressed (i.e., IN goes high).



## Parameter Control

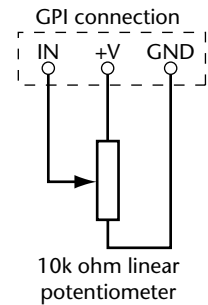
The following table describes how buttons (ON/OFF parameters), rotary controls and sliders, and pop-up menus can be controlled using a normally open switch.



High = switch closed Low = switch open

Terminal Usage	Normally Open Switch		
	Buttons (ON/OFF parameters)	Rotary controls & sliders	Pop-up menus
Normal	High = ON Low = OFF	High = max. value Low = min. value	High = top setting Low = bottom setting
Reverse	High = OFF Low = ON	High = min. value Low = max. value	High = bottom setting Low = top setting
Low-to-high	Toggles between ON and OFF when IN changes from low to high (i.e., when switch pressed)	Toggles between min. and max. values when IN changes from low to high (i.e., when switch pressed)	Toggles between top and bottom settings when IN changes from low to high (i.e., when switch pressed)
High-to-low	Toggles between ON and OFF when IN changes from high to low (i.e., when switch released)	Toggles between min. and max. values when IN changes from high to low (i.e., when switch released)	Toggles between top and bottom settings when IN changes from high to low (i.e., when switch released)

The next table describes how buttons (ON/OFF parameters), rotary controls and sliders, and pop-up menus can be controlled using a 10k-ohm linear-scale potentiometer. By connecting the potentiometer to the IN, +V, and GND terminals, continuously variable parameter control is possible.



High = potentiometer max. Low = potentiometer min.

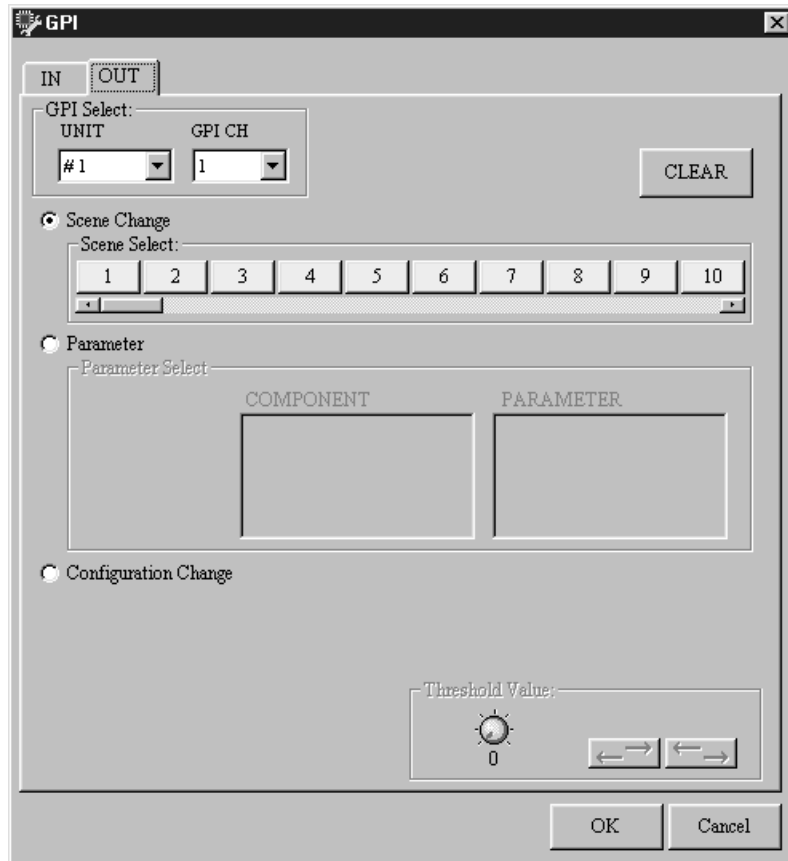
Terminal Usage	10k-ohm linear potentiometer		
	Buttons <sup>1</sup> (ON/OFF parameters)	Rotary controls & sliders	Pop-up menus
Normal	High = ON Low = OFF	Continuously variable, High = max. value Low = min. value	Continuously variable, High = top setting Low = bottom setting
Reverse	High = OFF Low = ON	Continuously variable, High = min. value Low = max. value	Continuously variable, High = bottom setting Low = top setting
Low-to-high	Toggles between ON and OFF when IN changes from low to high (i.e., when potentiometer raised)	Toggles between min. and max. values when IN changes from low to high (i.e., when potentiometer raised)	Toggles between top and bottom settings when IN changes from low to high (i.e., when potentiometer raised)
High-to-low	Toggles between ON and OFF when IN changes from high to low (i.e., when potentiometer lowered)	Toggles between min. and max. values when IN changes from high to low (i.e., when potentiometer lowered)	Toggles between top and bottom settings when IN changes from high to low (i.e., when potentiometer lowered)

1. Transition between low and high occurs at the center position.

## Assigning GPI Outputs

Scenes 1 through 99, or component parameters can be assigned to the GPI outputs.



- 1 Choose GPI from the Tool menu.  
The GPI window appears.
- 2 Click the OUT tab if the OUT page is not already shown.  
The OUT page appears, as shown below.



- 3 Select a DME32 (GPI Select: UNIT) and GPI output (GPI Select: GPI CH).
- 4 To assign a scene, click the Scene Change button, and then click a Scene Select button from 1 through 99. Use the scroll bar to see all the scene buttons. Then set the Terminal buttons.
- 5 To assign a component parameter, click the Parameter button, and then select component and parameter. Then set the Threshold Value and Terminal buttons.
- 6 To delete an assignment for the selected GPI output, click CLEAR.
- 7 Click OK to save your settings, or click Cancel to leave them unchanged.  
The GPI window closes.

You must compile and transfer the configuration to the DME32 for the GPI OUT settings to take effect. See "How to Build & Edit Configurations" on page 44 for more information.

The GPI OUT parameters are explained in the following table.

Section	Parameter	Range	Description
GPI Select	UNIT	1–4	Selects a DME32
	GPI CH	1–16	Selects a GPI output
Scene Change	Scene Select	1–99	Assigns a scene to the selected GPI output
Parameter	COMPONENT	1	Selects the component whose parameter is to be assigned
	PARAMETER	2	Selects the parameter to be assigned
Threshold Value	Level control	3	Sets the transition point at which the GPI output switches
	Terminal buttons		Low-to-high
			High-to-low

1. Components in the current configuration can be selected.
2. Depends on the component selected.
3. Depends on the parameter selected.

The following illustration shows GPI OUT terminals in the low and high conditions.





GPI settings are stored in configurations.

### Scene Recall

When GPI outputs are assigned to scenes, the OUT terminal switches between low and high in accordance with the Threshold Value and Terminal button setting, as shown in the following table.





High = +5 V    Low = 0 V

Threshold Value	Scene recalls	
	Before recall	After recall
 Low-to-high	OUT = low	OUT = high
 High-to-low	OUT = high	OUT = low

## Parameter Control

When GPI outputs are assigned to buttons (ON/OFF parameters), rotary controls and sliders, and pop-up menus, the OUT terminal switches between low and high in accordance with the Threshold Value and Terminal button settings, as shown in the following table.

High = +5 V    Low = 0 V

Threshold Value & Terminal buttons	Parameter type		
	Buttons (ON/OFF parameters)	Rotary controls & sliders	Pop-up menus
  <b>Low-to-high</b>	OFF = low ON = high	Value below threshold = low Value above threshold = high	Setting below threshold = low Setting above threshold = high
  <b>High-to-low</b>	OFF = high ON = low	Value below threshold = high Value above threshold = low	Setting below threshold = high Setting above threshold = low

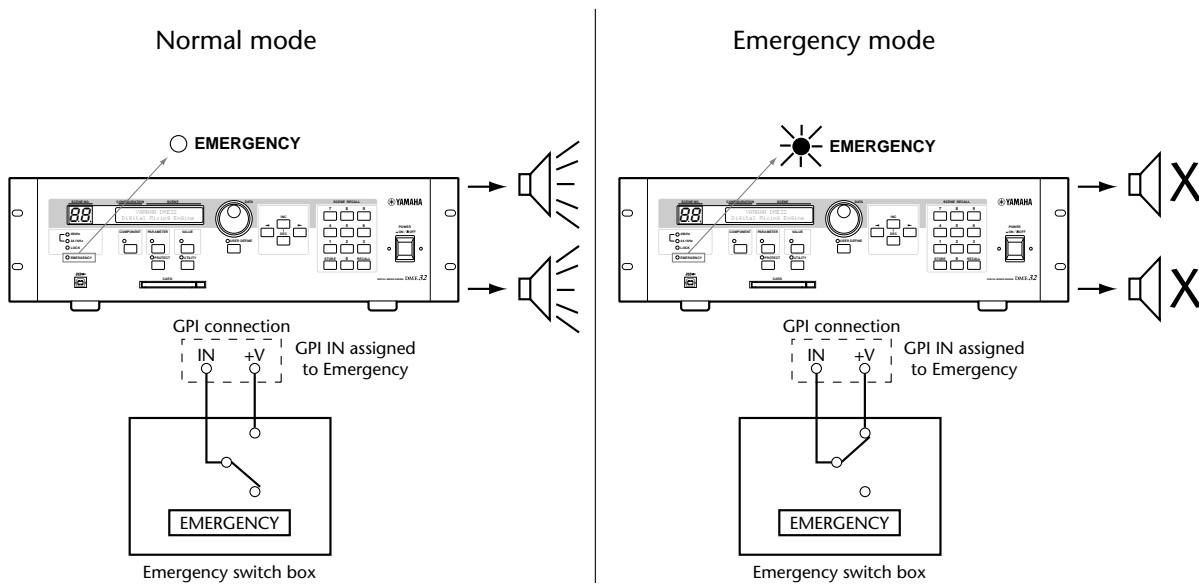


## Emergency Mode

A GPI input can be dedicated for use with Emergency mode, in which the DME32 mutes all outputs and the EMERGENCY indicator lights up. When the emergency condition is removed normal operation is resumed and the EMERGENCY indicator goes out.

In a multiple-unit system, all connected DME32s engage Emergency mode simultaneously via the cascade connections, so only one DME32 needs to have a GPI input configured for emergency.

The following illustration shows what happens in Emergency mode.



# PC Cards

---

# 12

## In this chapter...

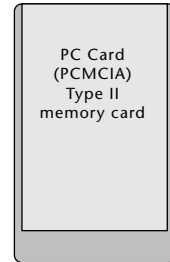
PC Cards & the DME32 .....	222
Inserting & Ejecting PC Cards .....	222
Formatting PC Cards .....	223
Saving Configurations to PC Cards .....	224
Loading Configurations from PC Cards .....	225
Deleting Configurations from PC Cards .....	226

## PC Cards & the DME32

Configurations can be saved to and loaded from readily available PCMCIA memory cards, also known as PC Cards. The DME32 supports Type II memory cards of any memory size. A single configuration requires approximately 600K of memory.

If your PC supports PC Cards, configurations can be saved to a PC Card and then loaded into the DME32 via its card slot. See page 60 for information on saving configurations. Likewise, configurations stored in the DME32 can be transferred to the PC by using PC Cards.

In a multiple-unit system, use only the PC Card slot on DME32 #1.



## Inserting & Ejecting PC Cards

PC cards can be inserted or ejected while the DME32 is either on or off.

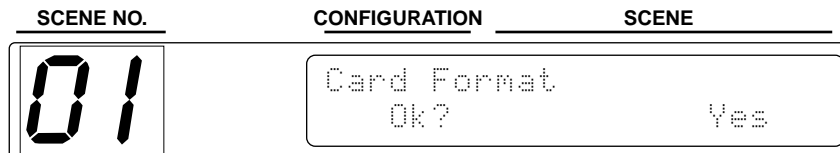
- 1 Insert the PC Card into the CARD slot, connector first and with the labeled-side facing up.
- 2 To eject the PC Card, press the eject button at the side of the CARD slot.  
Do not eject a PC Card while the DME32 is saving, loading, or deleting a configuration.

## Formatting PC Cards

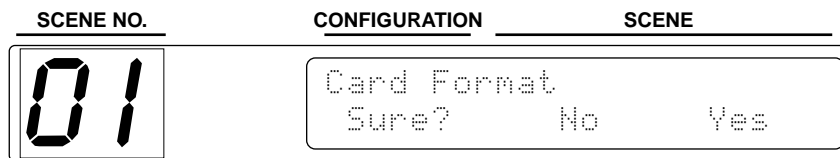
New PC Cards, and cards that have been used with other equipment must be formatted before they can be used with the DME32.

*Note: Formatting erases all previously stored data, so if you're reusing a PC Card, make sure that it contains no important data before formatting.*

- 1 Insert the PC Card into the DME32 CARD slot.
- 2 Use the [UTILITY] button to select the "Card Format" function.

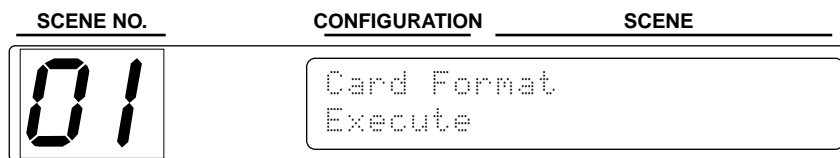


- 3 Press the [VALUE] button and the following display appears.

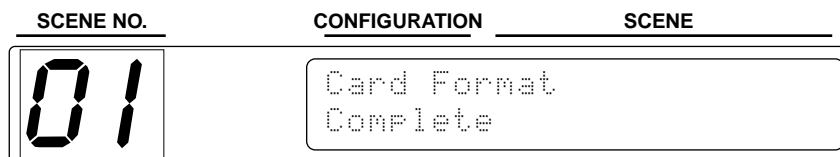


- 4 Press the [VALUE] button to format the PC Card, or the [PARAMETER] button to return to the previous display.

The following display appears while the PC Card is being formatted.



When formatting is complete, the following display appears.



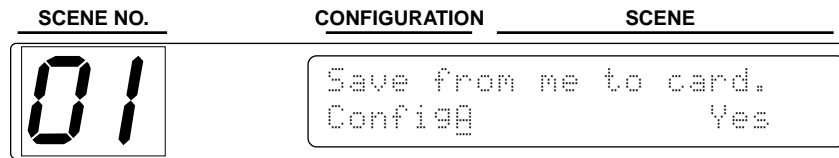
The PC Card is now ready for use.

- 5 Press the [UTILITY] button until the UTILITY indicator goes out.

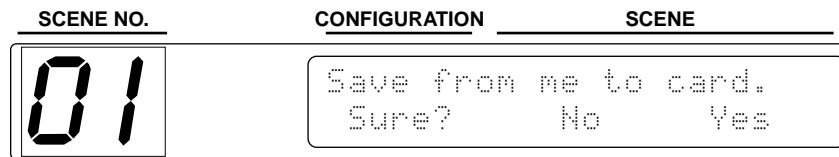
## Saving Configurations to PC Cards

Configurations can be saved to PC Cards as individual files, starting with “CNF1.DME”.

- 1 Insert the formatted PC Card into the DME32 CARD slot.
- 2 Use the [UTILITY] button to select the “Save to card” function.

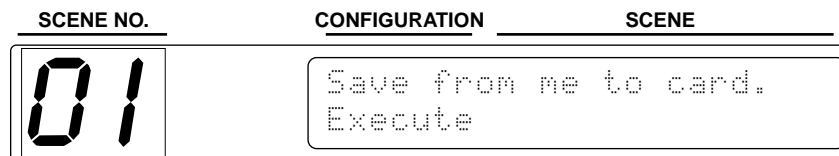


- 3 Use the DATA wheel or [INC] and [DEC] buttons to select the configuration that you want to save: A or B.
- 4 Press the [VALUE] button and the following display appears.



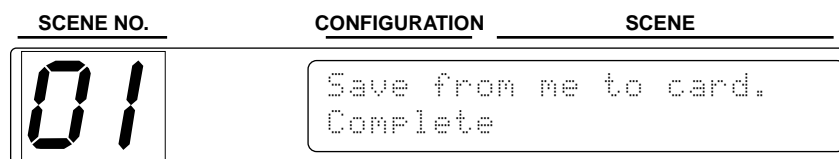
- 5 Press the [VALUE] button to save the selected configuration, or the [PARAMETER] button to return to the previous display.

The following display appears while the configuration is being saved.



If the PC Card is full, the message “Card full” appears.

When storing is complete, the following display appears.



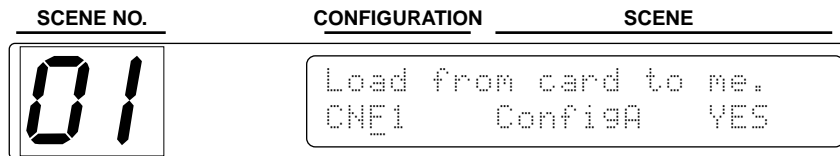
The selected configuration has been stored to the PC Card.

- 6 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.

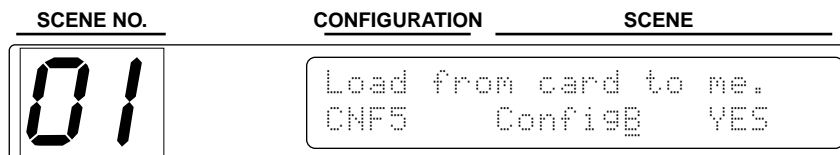
## Loading Configurations from PC Cards

Configurations stored on PC Cards can be loaded as either configuration A or B.

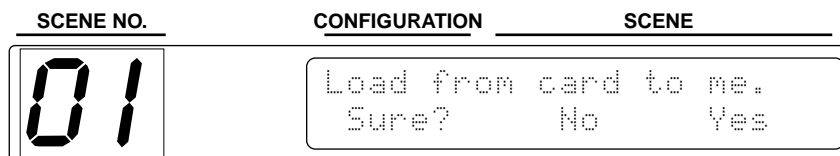
- 1 Insert the PC Card into the DME32 CARD slot.
- 2 Use the [UTILITY] button to select the "Load from card" function.



- 3 With the cursor in the COMPONENT section of the display, use the DATA wheel or [INC] and [DEC] buttons to select the configuration to load.
- 4 Use the [PARAMETER] button or cursor buttons to select the PARAMETER section of the display, and then use the DATA wheel or [INC] and [DEC] buttons to select the DME32 configuration into which you want to load the configuration, as shown in the following example.

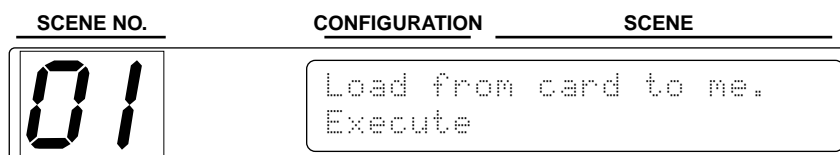


- 5 Press the [VALUE] button and the following display appears.

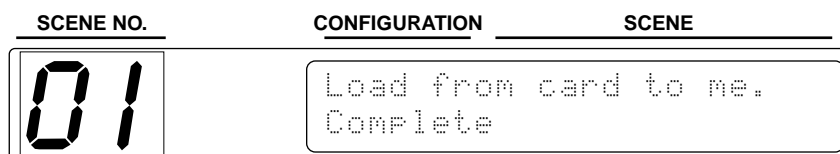


- 6 Press the [VALUE] button to load the selected configuration, or the [PARAMETER] button to return to the previous display.

The following display appears while the configuration is being loaded.



When loading is complete, the following display appears.



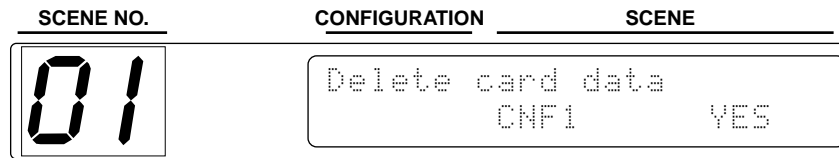
The selected configuration has been loaded to the DME32.

- 7 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.

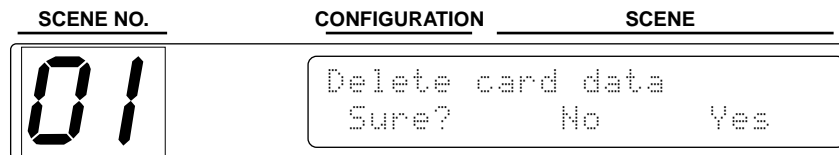
## Deleting Configurations from PC Cards

Individual configurations can be deleted from PC Cards as follows.

- 1 Insert the PC Card into the DME32 CARD slot.
- 2 Use the [UTILITY] button to select the “Delete card data” function.

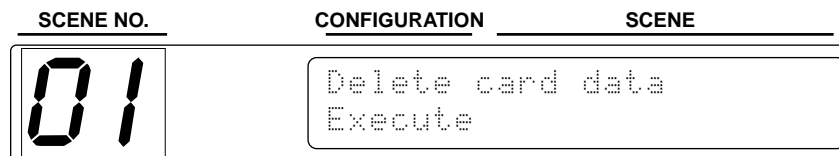


- 3 Use the DATA wheel or [INC] and [DEC] buttons to select the configuration that you want to delete.
- 4 Press the [VALUE] button and the following display appears.

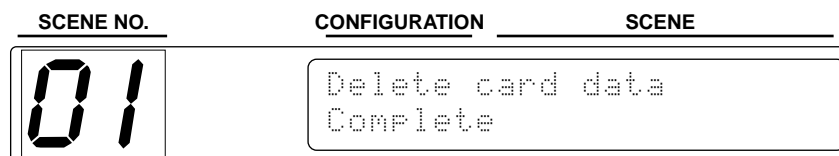


- 5 Press the [VALUE] button to delete the selected configuration, or the [PARAMETER] button to return to the previous display.

The following display appears while the configuration is being deleted.



When deleting is complete, the following display appears.



The selected configuration has been deleted from the PC Card.

- 6 Press the [UTILITY] button repeatedly until the UTILITY indicator goes out.

# Wordclocks

---

# 13

## In this chapter...

Wordclocks & the DME32 .....	228
Wordclock Connections .....	229
Selecting the Wordclock Source .....	229
Wordclock Hookup Examples .....	231
Terminating BNC Wordclock Distribution .....	234





## Wordclocks & the DME32

Unlike analog audio equipment, digital audio equipment must be synchronized when digital audio signals are transferred from one device to another, otherwise, signals may not be received correctly and audible noise, glitches, or clicks may occur. Synchronization is achieved using what's called a *wordclock*, which is a clock signal for synchronizing all the digital audio signals in a system. Note that wordclocks are not the same as SMPTE/EBU timecode or MIDI timecode, which are typically used to synchronize tape machines, MIDI sequencers, and so on. Wordclock synchronization refers to the synchronization of the digital audio processing circuits inside each digital audio device.

In a typical digital audio system, one device operates as the wordclock master, and the other devices operate as wordclock slaves, synchronizing to the wordclock master. If you're connecting to the DME32 using only analog inputs and outputs, no special wordclock settings are required, and the DME32 can be set to use its own internally generated wordclock. If you're connecting other equipment digitally, however, you must decide which device to use as the wordclock master and which devices to use as slaves. Normally, the DME32 should be used as the wordclock master. For certain applications, however, you may need to use another device as the wordclock master, in which case the DME32 must be configured as a wordclock slave.

Wordclock signals can be distributed via dedicated cables, typically BNC cables, or derived from digital audio connections, such as AES/EBU, which are synchronous and transmit a clock signal regardless of whether any digital audio is present.

The DME32 can be used as the 48 kHz wordclock master for an entire system, or slaved to an external wordclock source of between 39.69 kHz and 50.88 kHz. It can receive an external wordclock signal via its BNC WORDCLOCK IN or the input of a digital I/O card. In a multiple-unit system, wordclock signals are distributed among DME32s via the cascade connections. See "About Multiple DME32s" on page 236 for more information.

In a system where all devices share a common wordclock, it's important that all devices be turned on even if they're not being used. Turn on the wordclock master first, and then the slaves. When shutting down the system, turn off the slaves first, and then the master. Before use, make sure that the wordclock slaves are correctly locked to the wordclock master. Most devices have front panel indicators, similar to the LOCK indicator on the DME32, to show when they are wordclock locked. Refer to the relevant owner's manuals for more information.

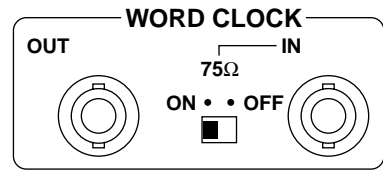
When the wordclock source is changed, lower the volume of your system just in case a device becomes unlocked and outputs any unpleasant noises.

## Wordclock Connections

The WORD CLOCK IN and WORD CLOCK OUT BNC connectors are used to transmit and receive wordclock signals with other digital audio equipment. When the wordclock source is set to Wordclock In, the DME32 locks to the wordclock signal received at the WORD CLOCK IN connector.

The WORD CLOCK OUT connector outputs the internally generated wordclock signal when the wordclock source is set to Internal, or the wordclock signal received at the WORDCLOCK IN when the wordclock source is set to Wordclock In.

The WORD CLOCK 75Ω ON/OFF switch is used to terminate the wordclock signal connected to the WORD CLOCK IN connector. See “Terminating BNC Wordclock Distribution” on page 234 for hookup examples.



An external wordclock can also be sourced from the input of a digital I/O card.

## Selecting the Wordclock Source

*Note: When the wordclock source is changed on the wordclock master device (e.g., AD824 or DME32), noise may occur from the DME32’s analog outputs, especially if an MY8-AT I/O card is installed, so turn down your power amps, or turn off the DME32 beforehand, otherwise any connected speakers may be damaged.*

- 1 Choose Word clock from the Tool menu.

The Word Clock window appears, as shown below.



The following wordclock sources can be selected.

Source	Description
<b>Word Clock In</b>	External wordclock via the BNC WORD CLOCK IN
<b>Internal</b>	Internal 48 kHz wordclock (default setting).
<b>My slot 1 1/2</b>	External wordclock via slot 1, input 1/2
<b>My slot 1 3/4</b>	External wordclock via slot 1, input 3/4
<b>My slot 1 5/6</b>	External wordclock via slot 1, input 5/6
<b>My slot 1 7/8</b>	External wordclock via slot 1, input 7/8
<b>My slot 2 1/2</b>	External wordclock via slot 2, input 1/2
<b>My slot 2 3/4</b>	External wordclock via slot 2, input 3/4
<b>My slot 2 5/6</b>	External wordclock via slot 2, input 5/6
<b>My slot 2 7/8</b>	External wordclock via slot 2, input 7/8
<b>My slot 3 1/2</b>	External wordclock via slot 3, input 1/2
<b>My slot 3 3/4</b>	External wordclock via slot 3, input 3/4
<b>My slot 3 5/6</b>	External wordclock via slot 3, input 5/6

Source	Description
My slot 3 7/8	External wordclock via slot 3, input 7/8
My slot 4 1/2	External wordclock via slot 4, input 1/2
My slot 4 3/4	External wordclock via slot 4, input 3/4
My slot 4 5/6	External wordclock via slot 4, input 5/6
My slot 4 7/8	External wordclock via slot 4, input 7/8

- 2 Select a wordclock source and then click OK to save your selection, or click Cancel to leave it unchanged.

The Word Clock window closes.

You must compile and transfer a configuration to the DME32 for the Word Clock settings to take effect. See “How to Build & Edit Configurations” on page 44 for more information.

When a configuration is transferred to the DME32, the DME32 checks the specified source to see if a usable wordclock signal is available. If such a signal exists, the DME32 locks to it and the LOCK indicator lights up. The 48kHz indicator lights up if the selected wordclock is at 48 kHz; the 44.1kHz indicator lights up if it’s at 44.1 kHz. Neither indicator lights up for other wordclock frequencies.

If a usable wordclock signal is not found, the DME32 will not operate and the LOCK indicator does not light up. In this situation, you must select another wordclock source or correct the selected external wordclock source. This condition also occurs if an external wordclock source is disconnected or the device supplying it is turned off.

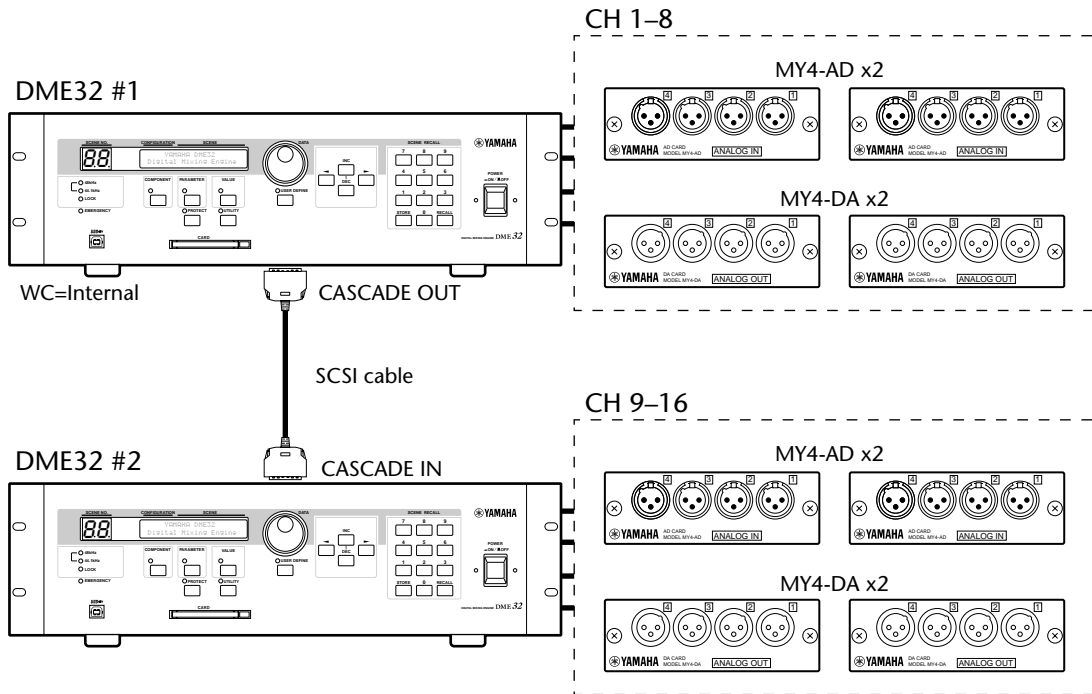
When using digital I/O cards other than the MY8-AE, the external wordclock is sourced from input 1/2 regardless of which input is selected.

The wordclock source can also be set from the DME32 front panel. See “Selecting the Wordclock Source” on page 209 for more information.

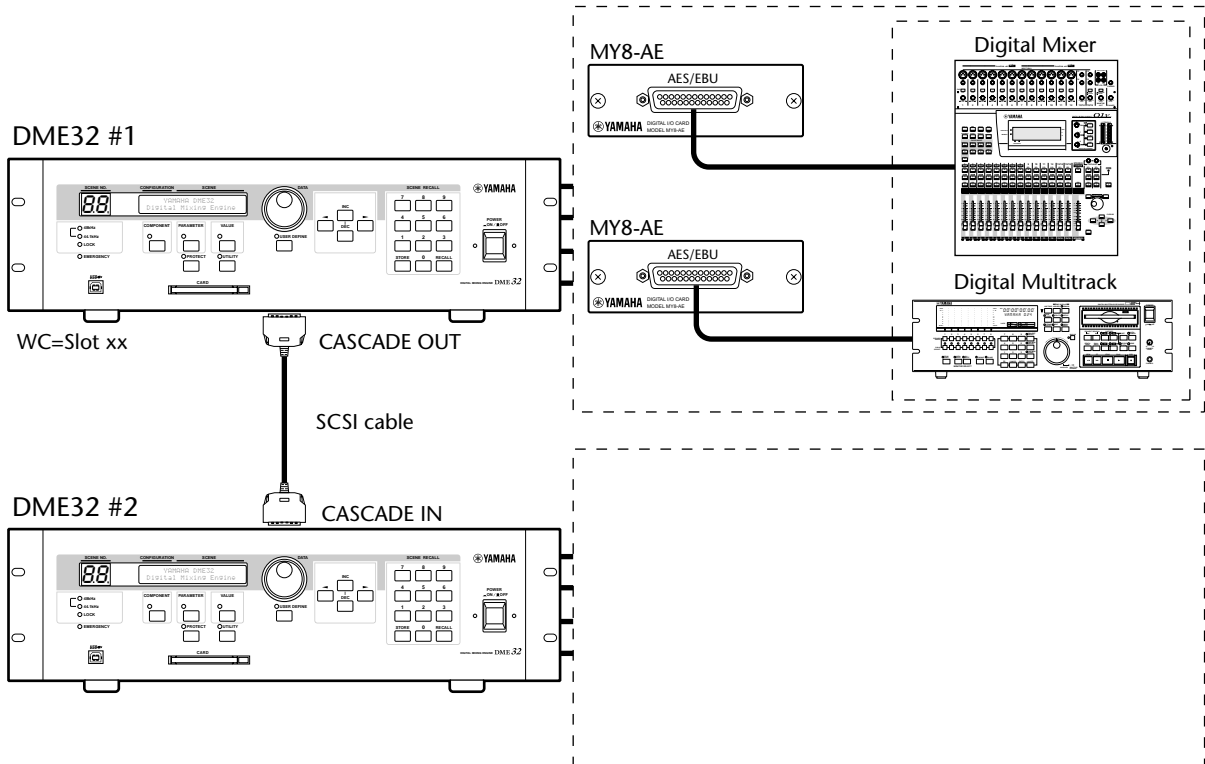
In a multiple-unit system, wordclock settings only need to be made on DME32 #1. The other DME32s automatically receive their wordclocks via the cascade connections.

# Wordclock Hookup Examples

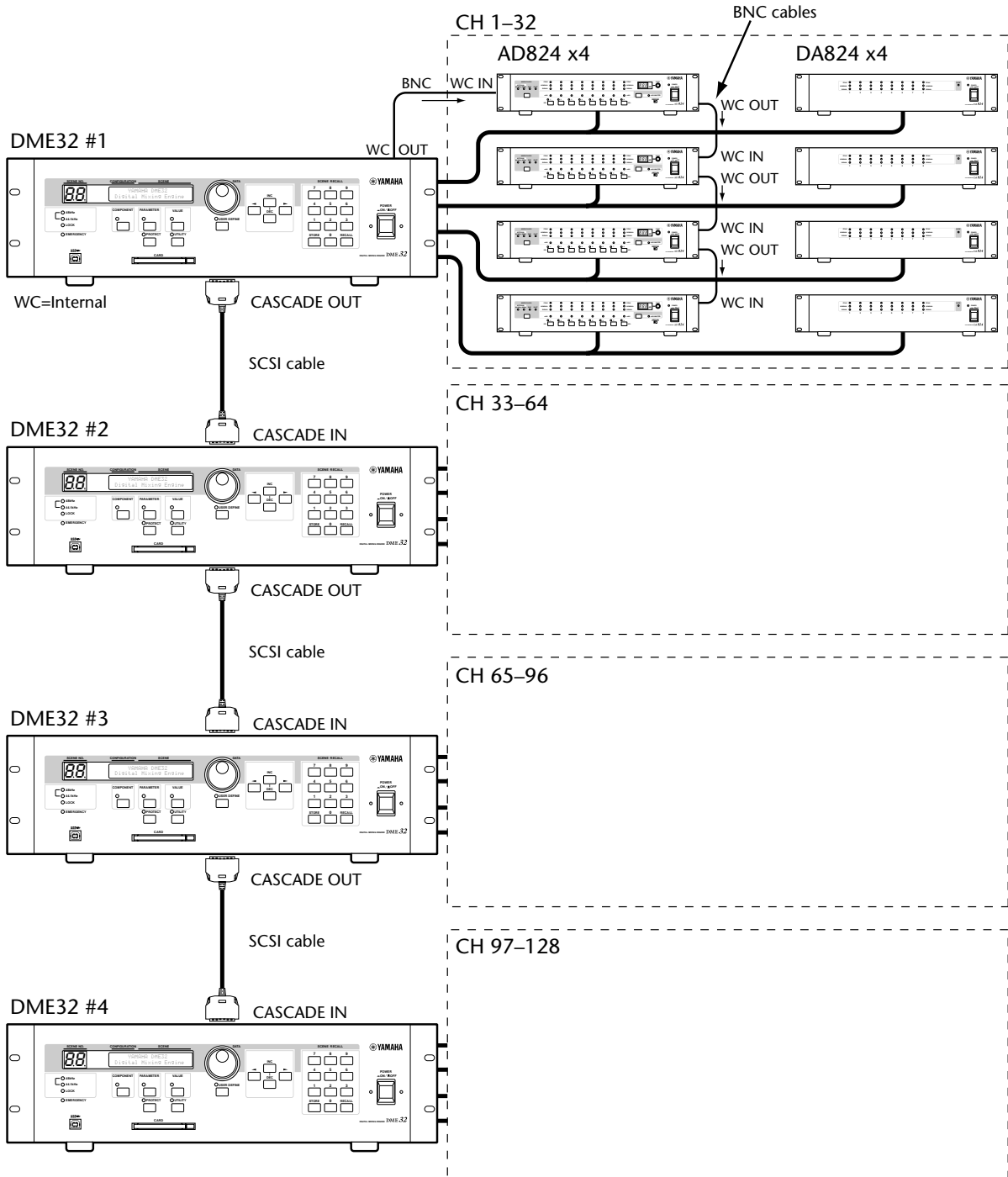
The following example shows how the wordclock can be configured when using two DME32s and MY4-AD and MY4-DA I/O cards for analog inputs and outputs. DME32 #1 is the wordclock master and its wordclock source is set to Internal. DME32 #2 automatically receives its wordclock from the cascade connection.



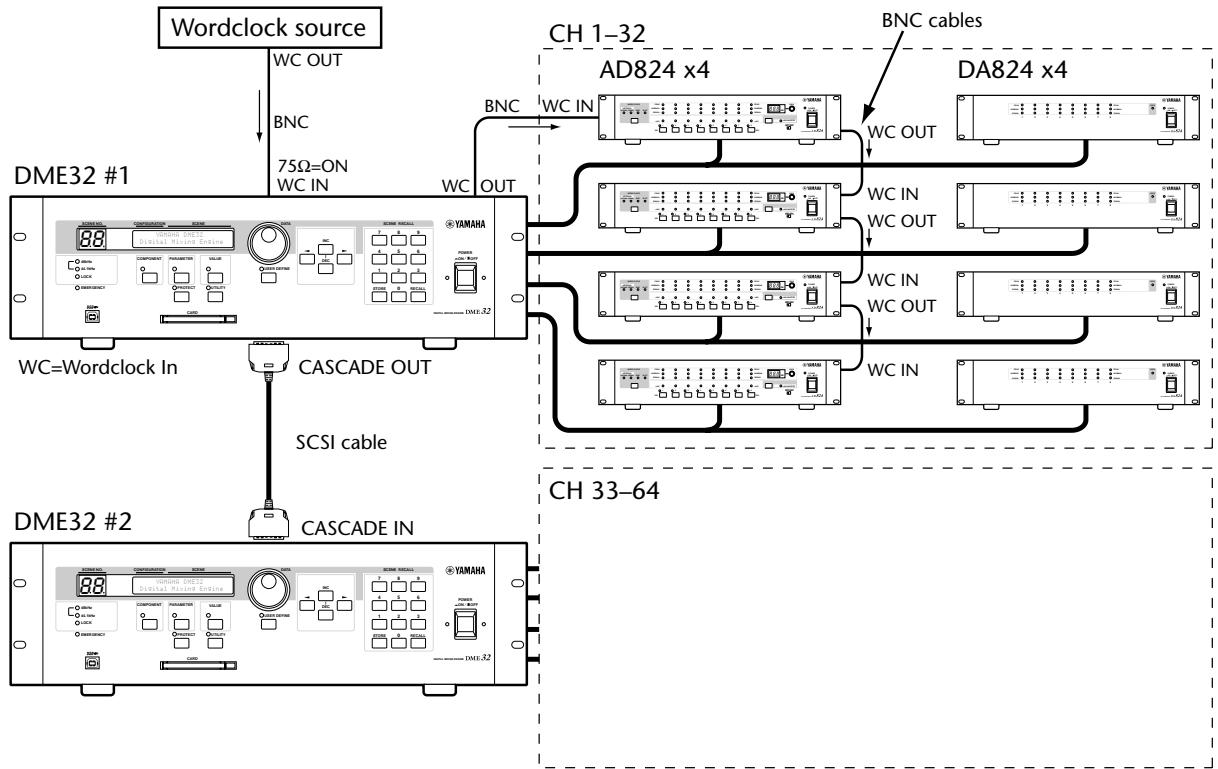
The next example shows how the wordclock can be configured when using external equipment as the wordclock master, in this case, a digital mixer or digital multitrack. DME32 #1 and #2 are both wordclock slaves. The wordclock source on DME32 #1 is set to a slot. DME32 #2 automatically receives its wordclock from the cascade connection.



The next example shows how the wordlock can be configured when using four DME32s and AD824 AD Converters and DA824 DA Converters for analog inputs and outputs. DME32 #1 is the wordlock master and its wordlock source is set to Internal. The other DME32s automatically receive their wordlocks via the cascade connections. The DA824s receive their wordlocks via their slot inputs, while the AD824s receive theirs via BNC connections from DME32 #1.



The last example shows how the wordclock can be configured when using an external wordclock source and BNC connections. DME32 #1 are DME32 #2 are both wordclock slaves. The wordclock source on DME32 #1 is set to Wordclock In. DME32 #2 automatically receives its wordclock from the cascade connection. The wordclock termination switch on DME32 #1 is set to ON. The DA824s receive their wordclocks via their slot inputs, while the AD824s receive theirs via BNC connections from DME32 #1.

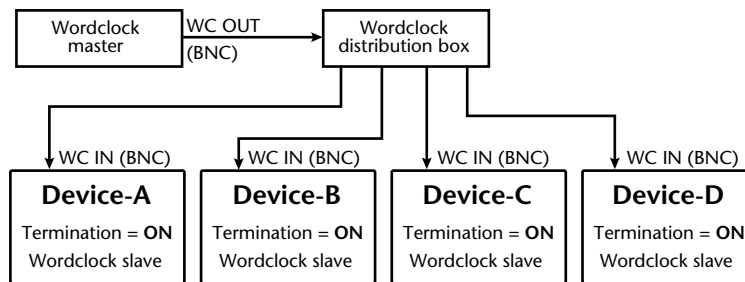


## Terminating BNC Wordclock Distribution

For correct and reliable operation, wordclock signals distributed via BNC cables must be terminated correctly. Termination is typically applied at the last device, although it depends on the distribution method being used. The DME32's WORD CLOCK 75Ω ON/OFF switch allows the DME32 to be connected in a variety of ways. The following examples show three ways in which wordclock signals can be distributed and how termination should be applied in each case.

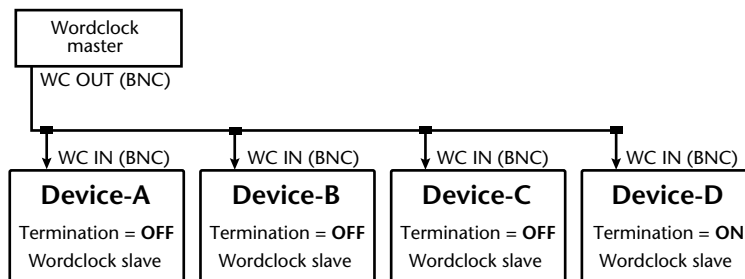
### Star Distribution

In this example, a dedicated wordclock distribution box is used to supply a wordclock signal to each device individually. Termination is applied at each device.



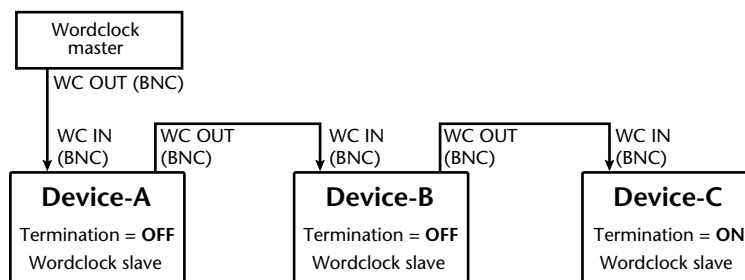
### Bus Distribution

In this example, the wordclock signal is distributed via a common bus. Termination is applied at the last device only.



### Daisy Chain Distribution

In this example, the wordclock signal is distributed in a “daisy-chain” fashion, with each device feeding the wordclock signal on to the next. Termination is applied at the last device only. This method of distribution is not recommended for larger systems.



# Multiple DME32s

---

# 14

## In this chapter...

About Multiple DME32s .....	236
Multiple-Unit System Notes .....	236
Cascade Connections .....	237
Multiple-unit Hookup Examples .....	238



## About Multiple DME32s

DME32s can be cascaded to expand the number of available input and output channels. Up to four DME32s can be cascaded, offering a maximum of 128 inputs and 128 outputs. DME32s can also be cascaded to provide additional DSP processing power, and signals can easily be distributed among cascaded DME32s by using the Cascade components. See “Cascade” on page 92 for more information.

The following table shows how the number of inputs and outputs can be expanded by using multiple DME32s.

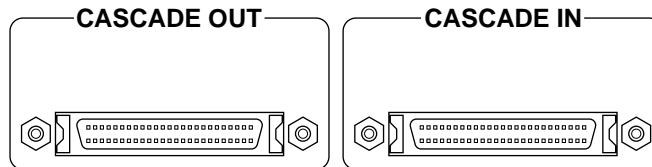
Number of Units (DME32)	I/O	
	Input	Output
1	32	32
2	64	64
3	96	96
4	128	128

## Multiple-Unit System Notes

- All DME32s must be turned on within 10 seconds.
- When a scene is stored or recalled using the Run Mode Controller, the corresponding scene is stored or recalled on all cascaded DME32s.
- When a configuration is recalled using the Run Mode Controller, the corresponding configuration is recalled on all cascaded DME32s.
- For front panel operation, scenes should be stored or recalled, and configurations recalled on DME32 #1.
- The password protection functions only need to be set on DME32 #1.
- Only the MIDI ports on DME32 #1 can be used.
- Only the PC Card slot on DME32 #1 can be used.
- The GPI interfaces on all cascaded DME32s can be used, providing a maximum of 64 GPI inputs and 64 GPI outputs with four DME32s.
- Wordclock settings only need to be made on DME32 #1. The other DME32s automatically receive their wordclocks via the cascade connections.

## Cascade Connections

The CASCADE IN and CASCADE OUT ports are used to transmit and receive digital audio signals and control signals in multiple-unit systems. Cascade connections use standard SCSI cables. The DME32's cascade ports use 50-pin half-pitch SCSI connectors, which mate with 50-pin half-pitch pin-type SCSI plugs. For reliable operation, use only SCSI cables of a high quality.



The maximum length of each SCSI cable must not exceed 10 meters (32 ft. 9 in.).

No special power-up sequence is required when turning on DME32s in a multiple-unit system, although all DME32s must be turned on within 10 seconds. Each DME32 is automatically assigned an ID as it's turned on. The DME32 with nothing connected to its CASCADE IN connector is automatically assigned ID #1, while the DME32 with nothing connected to its CASCADE OUT connector is automatically assigned the last ID.

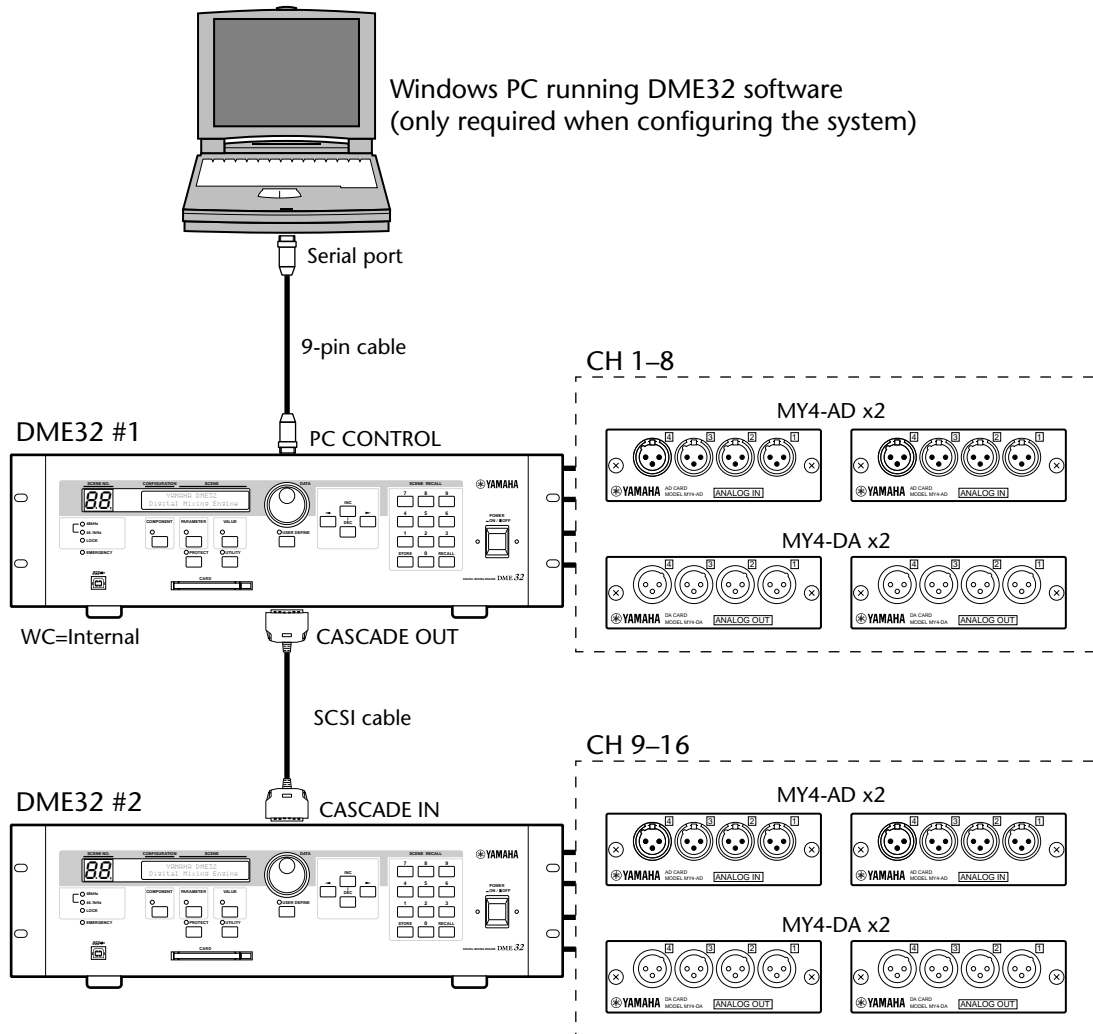
MIDI connections need only be made to DME32 #1. When DME32 #1 receives a Program Change message that has been assigned to Scene 10, for example, Scene 10 is recalled on all DME32s via the cascade connections.

In a multiple-unit system, the PC running DME Manager should be connected to DME32 #1. Control signals for the other DME32s are transmitted via the cascade connections.

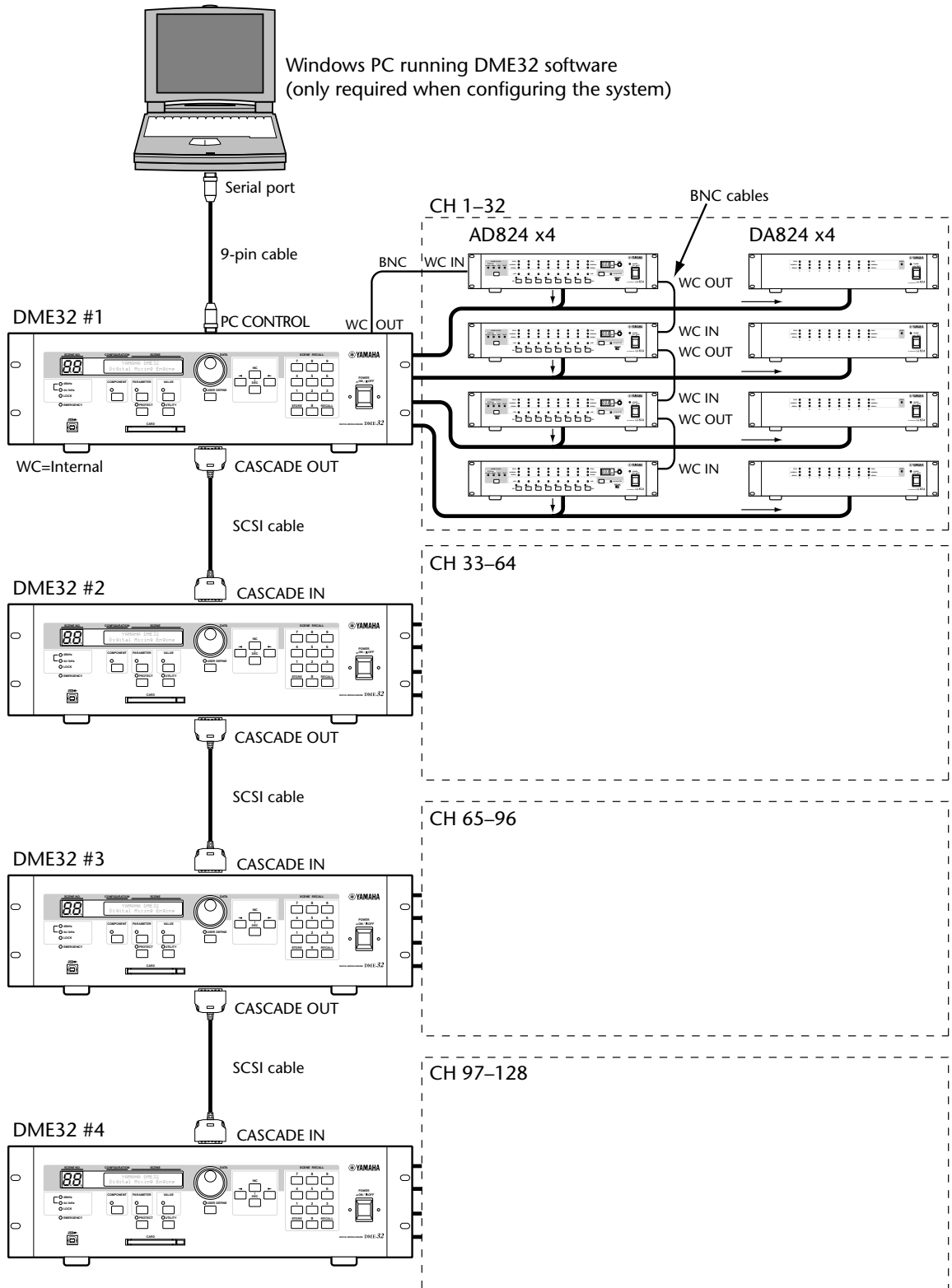
*Note: When the number of DME32s in a multiple-unit system is changed (e.g., DME32s are added or removed), all DME32s must be initialized.*

## Multiple-unit Hookup Examples

The following example shows how two DME32s can be cascaded to achieve 16 analog inputs and 16 analog outputs by using MY4-AD and MY4-DA I/O cards. DME32 #1 is automatically assigned ID #1 because nothing is connected to its CASCADE IN port, while DME32 #2 is automatically assigned ID 2 because nothing is connected to its CASCADE OUT port. DME32 #1 is the wordclock master and its wordclock source is set to Internal. DME32 #2 automatically receives its wordclock from the cascade connection.



The following example shows how four DME32s can be cascaded to achieve 128 inputs and 128 outputs. DME32 #1 is automatically assigned ID #1 because nothing is connected to its CASCADE IN port, while DME32 #4 is automatically assigned ID 4 because nothing is connected to its CASCADE OUT port. DME32 #1 is the wordclock master and its wordclock source is set to Internal. The other DME32s automatically receive their wordclocks via the cascade connections. The DA824s receive their wordclocks via their slot inputs, while the AD824s receive theirs via BNC connections from DME32 #1.



---

**MIDI**

---

# 15

**In this chapter...**

MIDI & the DME32 .....	242
MIDI Ports .....	242
MIDI Settings .....	242
Assigning Scenes & Configurations to Program Changes .....	244
Assigning Component Parameters to Control Changes .....	246
Component Parameters & Parameter Changes .....	248
Saving MIDI Settings .....	249
Loading MIDI Settings .....	250
Deleting MIDI Settings .....	250

## MIDI & the DME32

The DME32 supports the following MIDI messages:

- Program Changes for remote scene and configuration recall.
- Control Changes for remote parameter control.
- Parameter Changes (System Exclusive) for remote parameter control.

Scenes and configurations can be assigned to MIDI Program Changes and then recalled remotely from other MIDI equipment. See “Assigning Scenes & Configurations to Program Changes” on page 244 for more information. When an Program Change message is received, as well as recalling the assigned scene or configuration, the DME32 can trigger another device via the GPI interface. In addition, the DME32 can transmit Program Change messages when scenes or configurations are recalled from DME Manager, front panel controls, or GPI interface. Program Change messages are transmitted only for scenes and configurations that have been assigned to a Program Change.

Component parameters can be assigned to MIDI Control Changes and then controlled remotely from other MIDI equipment. See “Assigning Component Parameters to Control Changes” on page 246 for more information. When a Control Change message is received, as well as controlling the assigned parameter, the DME32 can trigger another device via the GPI interface. In addition, the DME32 can transmit Control Change messages when component parameters are adjusted from DME Manager, front panel controls, or GPI interface. Control Change messages are transmitted only for parameters that have been assigned to a Control Change.

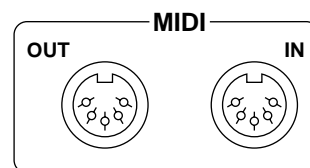
Component parameters can also be controlled by using Parameter Change messages. See “Component Parameters & Parameter Changes” on page 248 for more information.

MIDI settings, including scene and configuration to Program Change, and component parameter to Control Change assignments, can be saved to disk. See “Saving MIDI Settings” on page 249 for more information.

Along with MIDI Channel settings, parameters that determine how the DME32 transmits and receives Program Change and Control Change messages are provided on the MIDI Setup page. See “MIDI Settings” on page 242 for more information.

## MIDI Ports

The MIDI IN and OUT ports are used to transmit and receive MIDI messages with other MIDI equipment. The MIDI IN port receives messages, the MIDI OUT port transmits them. The MIDI OUT can also be used as a THRU port by making the appropriate ECHO settings on the MIDI Setup window. The MIDI Channels and the type of messages that the DME32 transmits and receives can also be set on this window. See “MIDI Settings” on page 242 for more information.



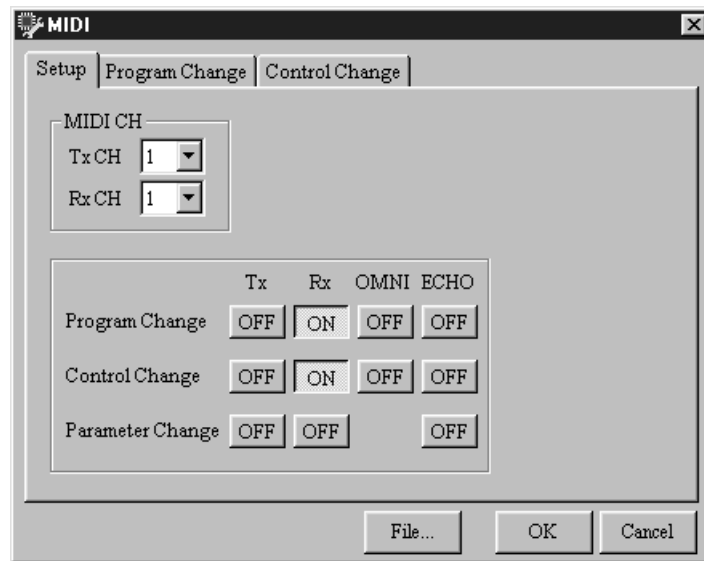
In a multiple-unit system, only the MIDI ports on DME32 #1 are used.

## MIDI Settings

The MIDI Channels used to transmit and receive MIDI messages and the way in which the DME32 processes Program Change, Control Change, and Parameter Change messages is set on the MIDI Setup page.

- 1 Choose MIDI from the Tool menu.

The MIDI window appears, as shown below.



- Click the Setup tab if the Setup page is not already shown. The MIDI Setup parameters are explained in the following table.

Section	Parameter	Range	Description
MIDI CH	Tx CH	1–16	Selects the MIDI Channel used to transmit MIDI messages and the Device Channel used to transmit Parameter Change messages
	Rx CH	1–16	Selects the MIDI Channel used to receive MIDI messages and the Device Channel used to receive Parameter Change messages
Program Change	Tx	ON/OFF	Determines whether or not Program Change messages are transmitted when assigned scenes or configurations are recalled
	Rx	ON/OFF	Determines whether or not assigned scenes or configurations are recalled when Program Change messages are received
	OMNI	ON/OFF	Determines whether the DME32 responds to Program Change messages received on the specified MIDI Channel only or Program Change messages received on all MIDI Channels
	ECHO	ON/OFF	Determines whether Program Change messages received at the MIDI IN port are echoed thru to the MIDI OUT port
Control Change	Tx	ON/OFF	Determines whether or not Control Change messages are transmitted when assigned parameters are adjusted
	Rx	ON/OFF	Determines whether or not assigned parameters are adjusted when Control Change messages are received
	OMNI	ON/OFF	Determines whether the DME32 responds to Control Change messages received on the specified MIDI Channel only or Control Change messages received on all MIDI Channels
	ECHO	ON/OFF	Determines whether Control Change messages received at the MIDI IN port are echoed thru to the MIDI OUT port
Parameter Change	Tx	ON/OFF	Determines whether or not Parameter Change messages are transmitted when component parameters are adjusted
	Rx	ON/OFF	Determines whether or not component parameters are adjusted when Parameter Change messages are received
	ECHO	ON/OFF	Determines whether Parameter Change messages received at the MIDI IN port are echoed thru to the MIDI OUT port

- 3 Make the required settings and then click OK to save your settings, or click Cancel to leave them unchanged.

The MIDI window closes.

MIDI settings are stored by the DME32 system, not scenes or configurations.

## Assigning Scenes & Configurations to Program Changes

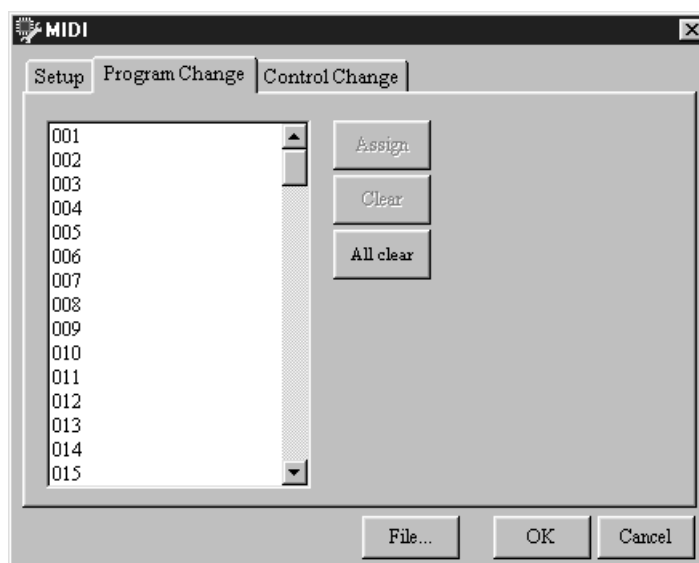
Scenes 1 through 99 and configurations A and B can be assigned to MIDI Program Changes 1 through 128. A table for you to note assignments is provided on page 279.

- 1 Choose MIDI from the Tool menu.

The MIDI window appears.

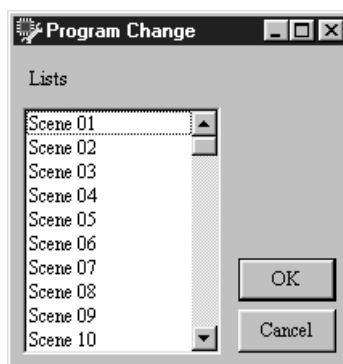
- 2 Click the Program Change tab.

The Program Change page appears, as shown below.



- 3 Select the Program Change that you want to assign and then click Assign, or simply double-click the Program Change number.

The Program Change window appears, as shown below.

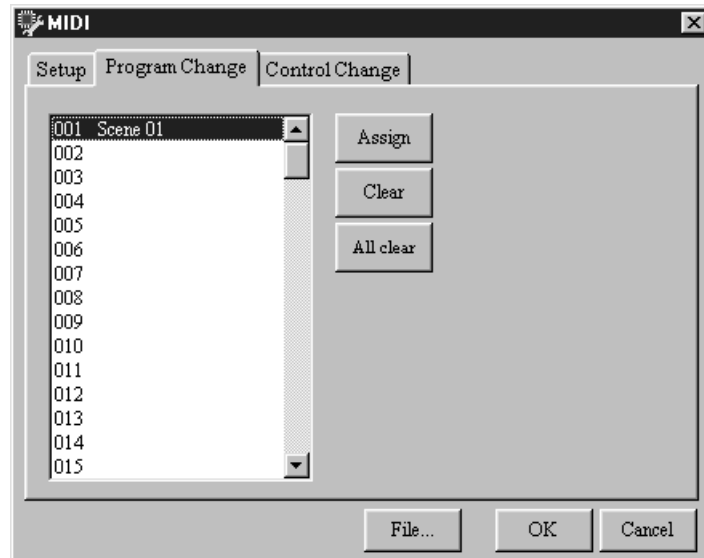


- 4 Select a scene from 01 through 99 or configuration A or B.
- 5 Click OK to save your selection, or click Cancel to leave the setting unchanged. The Program Change window closes.

If a scene or configuration has already been assigned to the selected Program Change, an overwrite confirmation message appears. Click OK to overwrite the previous assignment, or click Cancel to keep it.



The Program Change page displays the new assignment, as shown below.



To delete an individual assignment, select it, and then click Clear.

To delete all assignments, click All Clear.

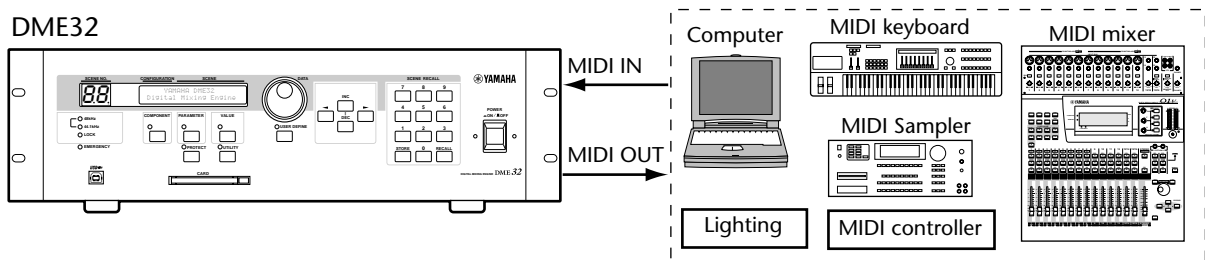
- 6 Click OK to save your assignments, or click Cancel to leave the settings unchanged.

The MIDI window closes.

Scene and configuration to Program Change assignments are stored by the DME32 system, not scenes or configurations.

If a scene or configuration is assigned to more than one Program Change, the lowest Program Change is transmitted when that scene or configuration is recalled.

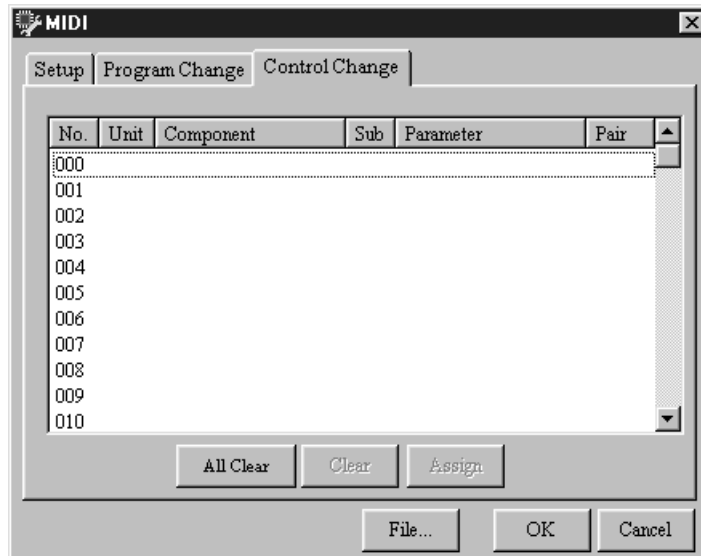
The following illustration shows the type of MIDI equipment that can be used with the DME32 for remote scene or configuration control using Program Change messages.



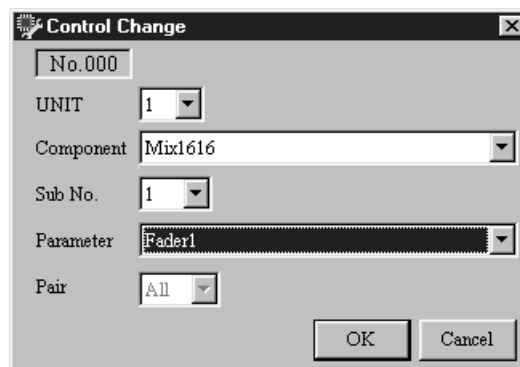
## Assigning Component Parameters to Control Changes

Parameters can be assigned to MIDI Control Changes 0 through 119, and an additional byte can be used to provide a higher resolution for more precise control of parameters with a large range. A table for you to note assignments is provided on page 280.

- 1 Choose MIDI from the Tool menu.  
The MIDI window appears.
- 2 Click the Control Change tab.  
The Control Change page appears, as shown below.



- 3 Select the Control Change that you want to assign and then click Assign, or simply double-click the Control Change number.  
The Control Change window appears, as shown below.



- 4 Make the required settings and then click OK to save them, or click Cancel to leave them unchanged.

The Control Change window closes.

If a parameter has already been assigned to the selected Control Change, an overwrite confirmation message appears. Click OK to overwrite the previous assignment, or click Cancel to keep it.

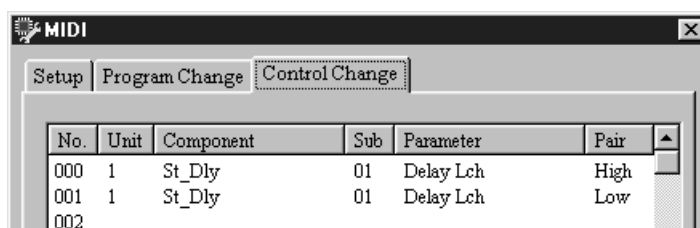
The Control Change window parameters are explained in the following table.

Parameter	Range	Description
UNIT	1-4	Selects the DME32 containing the parameter to be assigned
Component	1	Selects the component whose parameter is to be assigned
Sub No.	1-256	Selects individual components in configurations containing more than one component of the same type
Parameter	2	Selects the parameter to be assigned
Pair	All, High, Low	Selects 1- or 2-byte Control Changes

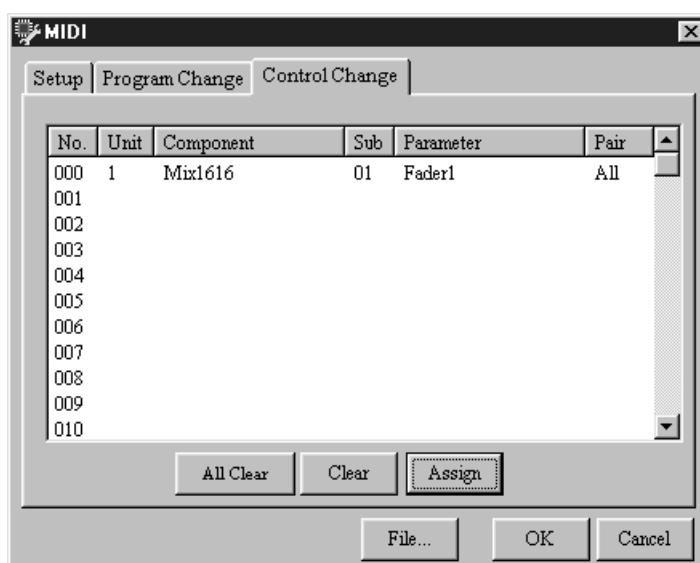
1. All available components can be selected.
2. Depends on the selected component.

The Sub No. parameter is used to select individual components in configurations that contain more than one component of the same type. For example, in a configuration with “Compressor” and “Compressor(2)” components, Sub No. 1 would select “Compressor” and Sub No. 2 would select “Compressor(2).”

The Pair parameter is set according to the variable range of the parameter. For parameters with a variable range of less than 128 steps, Pair should be set to All. Using the All setting for parameters with a variable range greater than 128 steps, however, will lower the resolution, resulting in imprecise control. In this case, the same parameter should be assigned to two Control Changes, one with Pair set to High, the other with Pair set to Low, as shown below. Using two Control Changes to control a single parameter in this way increases the resolution, providing precise control.



The Control Change page displays the new assignment, as shown below.



To delete an individual assignment, select it, and then click Clear.

To delete all assignments, click All Clear.

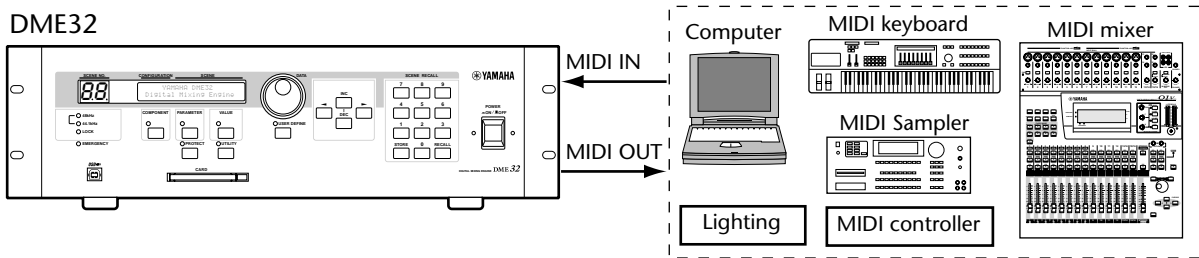
- Click OK to save your assignments, or click Cancel to leave the settings unchanged.

The MIDI window closes.

Parameter to Control Change assignments are stored by the DME32 system, not scenes or configurations.

If a parameter is assigned to more than one Control Change, the lowest Control Change is transmitted when that parameter is adjusted.

The following illustration shows the type of MIDI equipment that can be used with the DME32 for remote parameter control using Control Change messages.



## Component Parameters & Parameter Changes

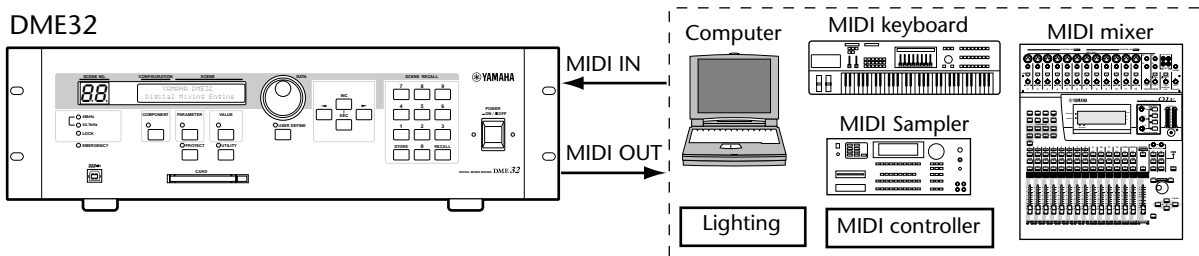
Component parameters can be controlled from other MIDI equipment by using Parameter Change messages, which are System Exclusive messages. When the Parameter Change Tx parameter is set to ON (see page 242), the DME32 transmits Parameter Change messages when component parameters are adjusted from DME Manager, front panel controls, or GPI interface. Only Parameter Change messages for parameters that are not already assigned to Control Changes are transmitted.

When the Parameter Change Rx parameter is set to ON, component parameters can be adjusted remotely by transmitting the necessary Parameter Change messages to the DME32.

The Device Channels used to transmit and receive Parameter Changes are the same as the specified MIDI Transmit (Tx) and Receive (Rx) Channels.

Other parameters that determine how the DME32 transmits and receives Parameter Change messages are provided on the MIDI Setup page. See “MIDI Settings” on page 242 for more information.

The following illustration shows the type of MIDI equipment that can be used with the DME32 for remote parameter control using Parameter Change messages.



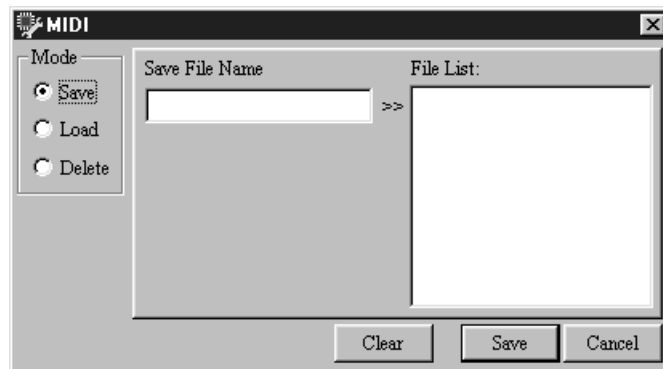
The format for Parameter Change messages is as follows:

STATUS	11110000	F0	System Exclusive Message
ID No.	01000011	43	Manufacturer's ID No.(YAMAHA)
SUB STATUS	0001nnnn	1n	parameter change or response for request n=0-15 (Device Channel No.1-16)
GROUP ID	00111110	3E	group ID (digital mixer)
MODEL ID	00000101	05	Device code (DME32)
PARAM TYPE	00000000	00	byte operation for edit buffer
DATA	0000aaaa	dd1	Parameter No. (H high order bit)
	0000bbbb	dd2	Parameter No. (H low order bit)
	0000cccc	dd3	Parameter No. (L high order bit)
	0000dddd	dd4	Parameter No. (L low order bit)
	0000eeee	dd5	Parameter value (H high order bit)
	0000ffff	dd6	Parameter value (H low order bit)
	0000gggg	dd7	Parameter value (L high order bit)
	0000hhhh	dd8	Parameter value (L low order bit)
EOX	11110111	F7	End Of Exclusive

For reference, Parameter No. values can be printed from DME Manager.

## Saving MIDI Settings

- 1 Choose MIDI from the Tool menu—the main MIDI window appears.
- 2 Click File—the MIDI window appears, as shown below.



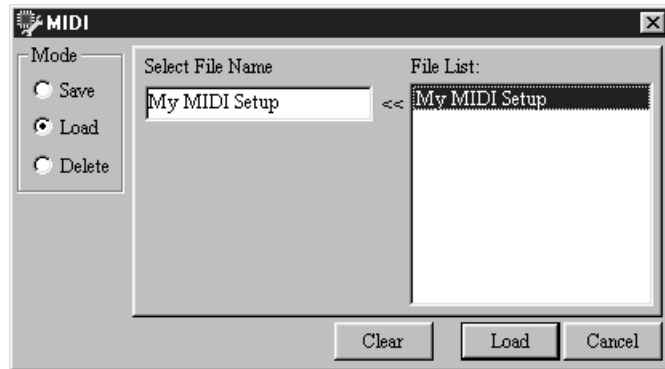
- 3 In the Mode section, select Save.
- 4 In the Save File Name field, enter a title for the MIDI settings.  
Titles can be up to 24 characters long. Click the Clear button to clear the title if you want to start again.
- 5 Click Save.

The MIDI settings are saved and the MIDI window closes. If a file with the same title already exists, an overwrite confirmation message appears. Click OK to overwrite and continue, or click Cancel to cancel the operation.

MIDI settings are saved in the “Midi” folder, which is located inside the DME Manager program folder. MIDI settings files can be managed (e.g., copied, deleted, backed up, etc.) just like any other Windows file.

## Loading MIDI Settings

- 1 Choose MIDI from the Tool menu—the main MIDI window appears.
- 2 Click File—the MIDI window appears.
- 3 In the Mode section, select Load.
- 4 Select the MIDI settings that you want to load from the File List.  
The title of the selected settings appears in the Select File Name field, as shown below.



Click the Clear button to cancel the selection if you want to select again.

- 5 Click Load.  
The selected MIDI settings are loaded and the MIDI window closes.

## Deleting MIDI Settings

- 1 Choose MIDI from the Tool menu—the main MIDI window appears.
- 2 Click File—the MIDI window appears.
- 3 In the Mode section, select Delete.
- 4 Select the MIDI settings that you want to delete from the File List, as shown below.



Click the Clear button to cancel your selection if you want to select again.

- 5 Click Delete.  
The selected MIDI settings are deleted.

# I/O Options

---

# 16

## In this chapter...

I/O Options & the DME32 .....	252
I/O Card Specifications .....	253
Choosing I/O Cards .....	253
Installing I/O Cards .....	255
AD824 & DA824 Converters .....	256

## I/O Options & the DME32

For analog and digital audio inputs and outputs, the DME32 uses optional mini YGDAI (Yamaha General Digital Audio Interface) I/O cards, which offer several analog I/O options and digital I/O interfaces in all the popular digital audio interconnect formats, including AES/EBU, ADAT, and Tascam TDIF-1.

Analog I/O is also possible using the Yamaha AD824 AD Converter and DA824 DA Converter. See “AD824 & DA824 Converters” on page 256 for more information.

The Yamaha 01V Digital Mixing Console and D24 Digital Multitrack Recorder also use mini YGDAI I/O cards. Note that the YGDAI cards used by the Yamaha 02R Digital Recording Console and 03D Digital Mixing Console are not interchangeable with mini YGDAI cards.

The following mini YGDAI cards are currently available. See the Yamaha Professional Audio Web site at the following URL for up-to-date news on mini YGDAI cards: <<http://www.yamaha.co.jp/product/proaudio/homeenglish/>>.

### **MY8-AD—8 Analog Inputs**

The MY8-AD card provides eight electronically balanced analog inputs via phone jack connectors, with 20-bit 128-times oversampling A/D converters.

### **MY4-AD—4 Analog Inputs**

The MY4-AD card provides four electronically balanced analog inputs via female XLR connectors, with 24-bit 128-times oversampling A/D converters.

### **MY4-DA—4 Analog Outputs**

The MY4-DA card provides four electronically balanced analog outputs via male XLR connectors, with 20-bit 128-times oversampling D/A converters.

### **MY8-AT—ADAT**

The MY8-AT card provides ADAT format digital I/O via two MultiChannel Optical Digital Interface connectors, and supports 16-, 20-, and 24-bit wordlengths.

### **MY8-AE—AES/EBU**

The MY8-AE card provides AES/EBU format digital I/O via a 25-pin D-sub connector, and supports 16-, 20-, and 24-bit wordlengths.

### **MY8-TD—Tascam TDIF-1**

The MY8-TD card provides Tascam TDIF-1 format digital I/O via a 25-pin D-sub connector, and supports 16-, 20-, and 24-bit wordlengths. A BNC connector is provided for wordclock output.

MY8-TD cards feature a device selector switch (EXT: 88/INT: 38) that should be set to match the device being connected. This should be set to “EXT: 88” when connecting a Tascam DA-88, or “INT: 38” when connecting a Tascam DA-38 or other digital audio device.



## I/O Card Specifications

Specifications for the currently available I/O cards are as follows.

Card	Format	In	Out	A/D	D/A	Wordlength	Connectors
MY8-AD	Analog input	8	—	20-bit, 128 times	—	—	Phone jack (balanced) x8
MY4-AD	Analog input	4	—	24-bit, 128 times	—	—	XLR-3-31 type (balanced) x4
MY4-DA	Analog output	—	4	—	20-bit, 128 times	—	XLR-3-32 type (balanced) x4
MY8-AT	ADAT	8	8	—	—	16, 20, 24	Optical x2
MY8-AE	AES/EBU	8	8	—	—	16, 20, 24	25-pin D-sub (cable not included)
MY8-TD	Tascam TDIF-1	8	8	—	—	16, 20, 24	25-pin D-sub BNC wordclock output

As these specifications show, analog I/O cards offer either inputs or outputs, while digital I/O cards offer both inputs and outputs.

## Choosing I/O Cards

The DME32 features four I/O slots, for a total of 32 inputs and 32 outputs, which correspond to the slots as follows:

DME32 Slot	DME32 Channels	
	Inputs	Output
1	1–8	1–8
2	9–16	9–16
3	17–24	17–24
4	25–32	25–32

The type of cards you choose affects the number of channels that can be accessed. To access all 32 inputs and all 32 outputs, for example, you need to install four digital I/O cards. If you install four MY8-AD 8-channel analog input cards, for example, you can access all 32 inputs but no outputs. Analog access to all 32 inputs and all 32 outputs can be achieved by using Yamaha AD824 DA Converters and Yamaha DA824 DA Converters. See “AD824 & DA824 Converters” on page 256 for more information.

Analog and digital I/O cards can be combined, so you could for example, install two MY8-AD 8-channel analog input cards in slots 1 and 2, providing analog access to input channels 1 through 16, and install two digital I/O cards in slots 3 and 4, which would provide digital access to input and output channels 17 through 32.

Any of the four I/O slots can be selected as the external wordclock source when using digital I/O cards. See “Selecting the Wordclock Source” on page 229 for more information.

To connect the DME32 to other digital audio equipment, you must determine which digital interconnect format—AES/EBU, ADAT, or Tascam TDIF-1—the other equipment supports, and then install the necessary I/O cards in the DME32.

The following table shows which cards to use when connecting the DME32 to other Yamaha digital audio products. Each product can be connected using the preferred interface format—AES/EBU, ADAT, or Tascam TDIF-1.

Product	Total slot I/O		Max. # of Cards	Format	Card for Product	Card for DME32
	Outs	Ins				
Yamaha AD824	8	—	1	ADAT	MY8-AT	MY8-AT
				Tascam TDIF-1	MY8-TD	MY8-TD
				AES/EBU	MY8-AE	MY8-AE
Yamaha DA824	—	8	1	ADAT	MY8-AT	MY8-AT
				Tascam TDIF-1	MY8-TD	MY8-TD
				AES/EBU	MY8-AE	MY8-AE
Yamaha D24	8	8	4	ADAT	MY8-AT	MY8-AT
				Tascam TDIF-1	MY8-TD	MY8-TD
				AES/EBU	MY8-AE	MY8-AE
Yamaha 01V	8	8	1	ADAT	MY8-AT	MY8-AT
				Tascam TDIF-1	MY8-TD	MY8-TD
				AES/EBU	MY8-AE	MY8-AE
Yamaha 02R	16	32	4 single or 2 double	ADAT	CD8-AT	MY8-AT
				Tascam TDIF-1	CD8-TDII	MY8-TD
				AES/EBU	CD8-AE or CD8-AE-S	MY8-AE
Yamaha 03D	8	8	1	ADAT	CD8-AT	MY8-AT
				Tascam TDIF-1	CD8-TDII	MY8-TD
				AES/EBU	CD8-AE or CD8-AE-S	MY8-AE

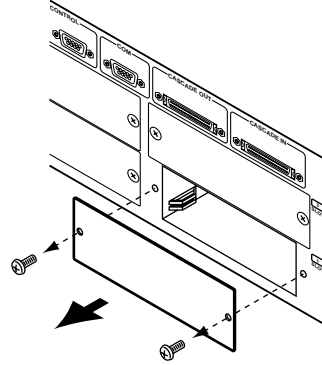
Using ADAT I/O cards in certain devices can cause wordclock-lock problems, so it's recommend that you source wordclock signals via I/O cards of another format.

See your Yamaha dealer for more information.

## Installing I/O Cards

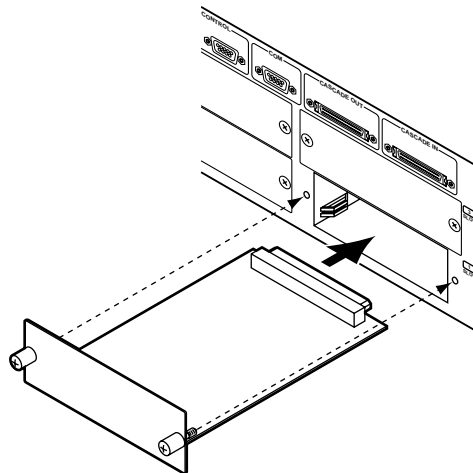
This section explains how to install mini YGDAI cards in the DME32.

- 1 Turn off the DME32.
- 2 Undo the two fixing screws and remove the slot cover, as shown below.



Keep the cover and fixing screws in a safe place for future use.

- 3 Insert the card between the guide rails and slide it all the way into the slot, as shown below. You may have to push firmly to plug the card into the DME32 connector.



- 4 Secure the card using the attached thumbscrews. Do not leave the thumbscrews loose, as the card will not be grounded correctly.

You can check the type of I/O card installed in each slot by using the Slot function. See “Checking the I/O Slots” on page 210 for more information.

## AD824 & DA824 Converters

### AD824

The Yamaha AD824 is a high-performance 8-channel analog-to-digital converter that has been designed primarily for use with the DME32

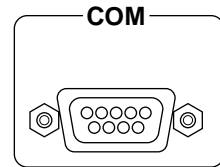
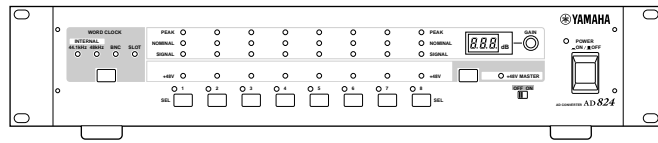
Digital Mixing Engine. The AD824 features 24-bit linear analog-to-digital converters and 128-times oversampling, offering a typical dynamic range of 110 dB. Optional mini YGDAI cards offer a variety of digital output interfaces, with support for all the popular digital audio interconnect formats, including AES/EBU, ADAT, and Tascam TDIF-1. Analog inputs feature electronically balanced XLRs.

In addition, AD824 input channels feature electronically balanced analog insert points on two 1/4" TRS phone jacks, high-quality mic preamps, independently switchable 48-volt phantom powering, and rotary gain adjustment.

By connecting the DME32 COM port, shown here, to the AD824 COM PC/RS422 port with a 9-pin serial cable, remote and recallable control of the AD824 is possible from DME Manager.

The COM PC/RS422 switch on the AD824 should be set to RS422 when connecting a DME32 or another AD824.

DME Manager features Gain Trimmer components especially for use with the AD824. See “Gain Trimmer” on page 175 for more information.



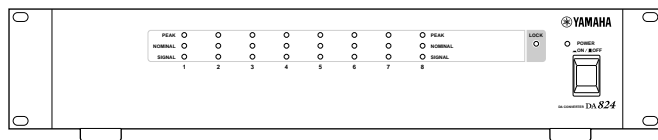
### DA824

The Yamaha DA824 is a high-performance 8-channel digital-to-analog converter that has been designed primarily for use with the DME32

Digital Mixing Engine. The DA824 features 24-bit linear digital-to-analog converters and 128-times oversampling, offering a typical dynamic range of 110 dB. Optional mini YGDAI cards offer a variety of digital input interfaces, with support for all the popular digital audio interconnect formats, including AES/EBU, ADAT, and Tascam TDIF-1. Analog outputs feature electronically balanced XLRs and 1/4" phone jacks.

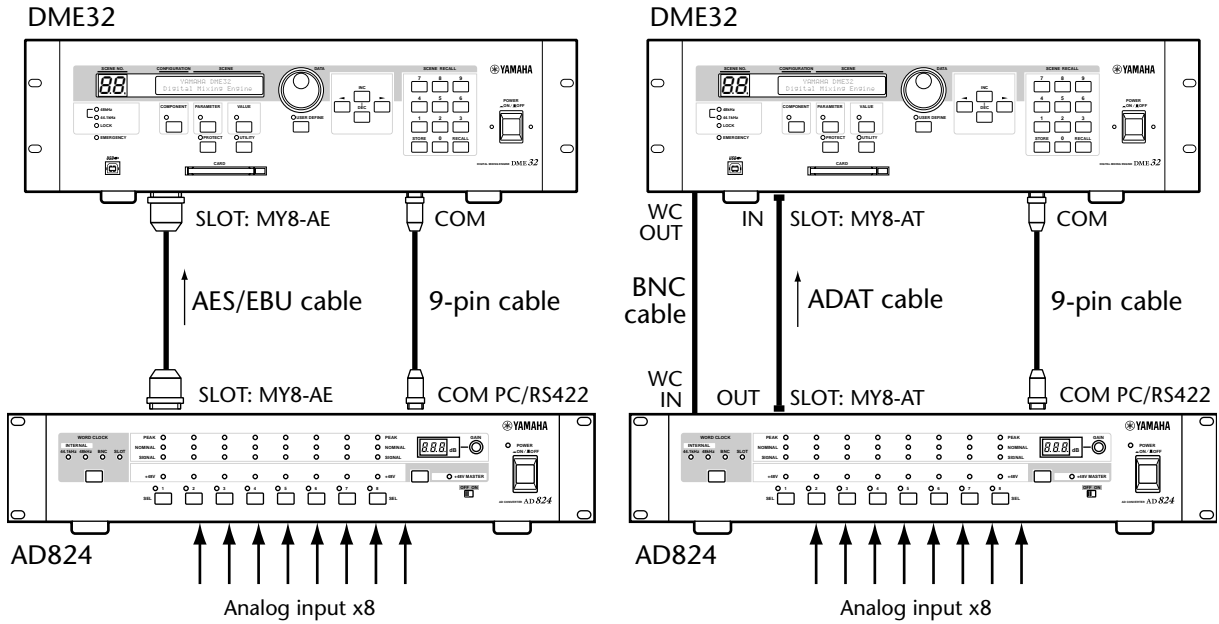
See your Yamaha dealer for more information on the AD824 and DA824.

Hookup examples using the AD824 and DA824 are provided on the following pages.

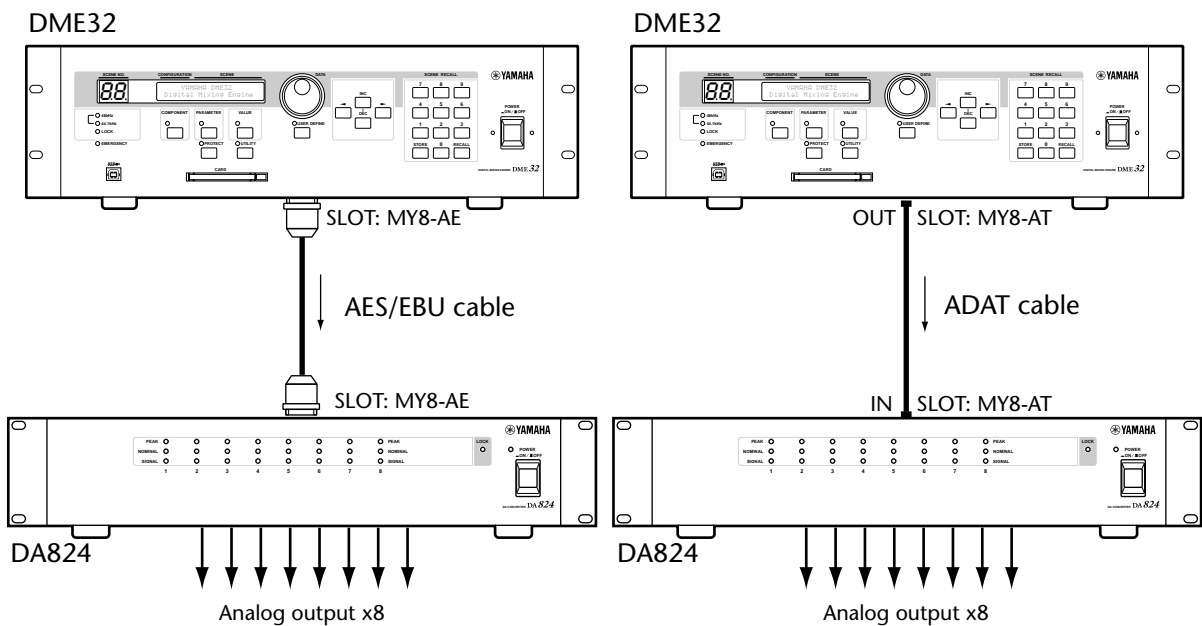


## Hookup Examples

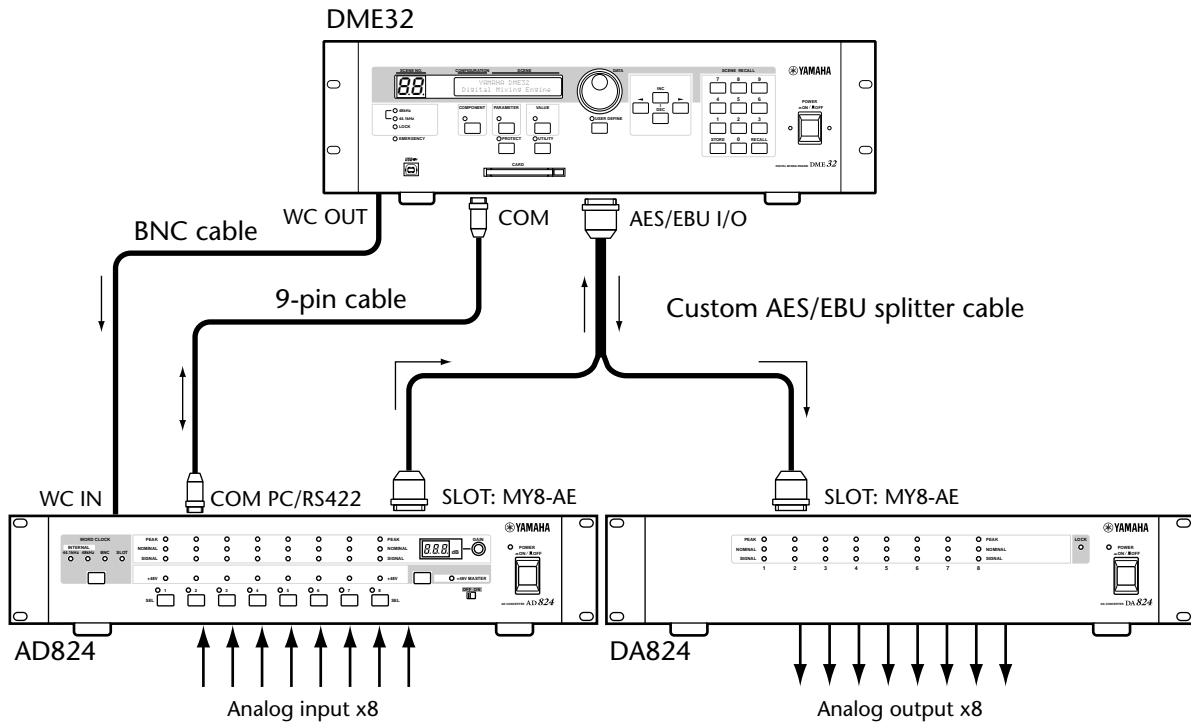
The following two examples show how the AD824 AD Converter can easily be connected to the DME32 using AES/EBU and ADAT interfaces. The only drawback with this type of connection is that only the eight inputs of each slot can be accessed, not the eight outputs.



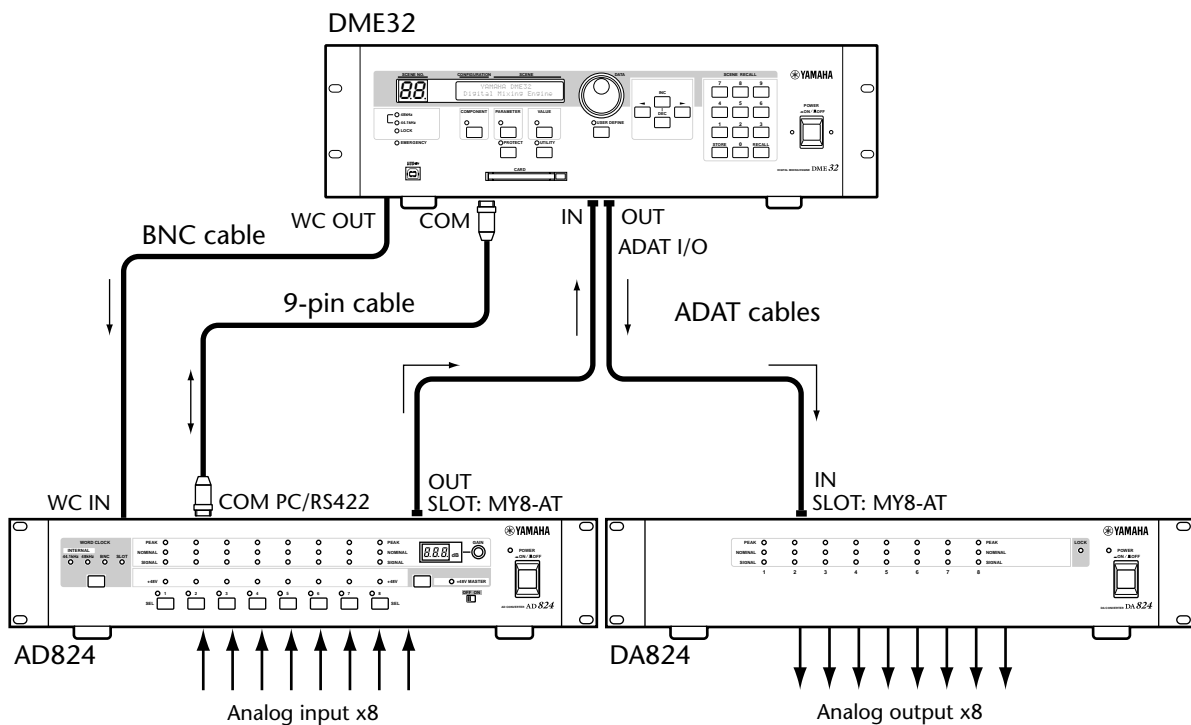
The next two examples show how the DA824 DA Converter can be connected to the DME32 using AES/EBU and ADAT interfaces. Like the previous example, this type of connection has the disadvantage that only the eight outputs of each slot can be accessed, not the eight inputs.



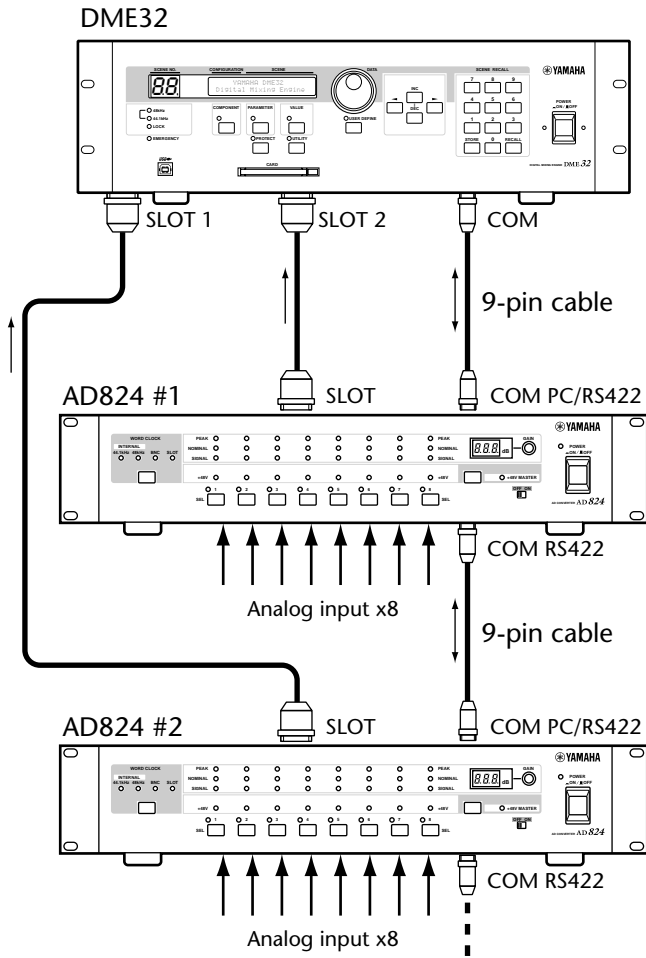
The next example shows how the AD824 and DA824 can both be connected to a single DME32 slot by using MY8-AE I/O cards and a custom AES/EBU splitter cable. The advantage of this type of connection is that all eight inputs and outputs of each slot can be accessed. Pin wiring details for the AES/EBU interface are supplied with each MY8-AE card. The DME32 is wordclock master, with the AD824 receiving its wordclock via a BNC connection, the DA824, via its slot input.



The next example shows how the AD824 and DA824 can be connected to a single DME32 slot by using MY8-AT I/O cards and standard ADAT connecting cables. Like the previous example, this type of connection has the advantage that all eight inputs and outputs of each slot can be accessed. The DME32 is wordclock master, with the AD824 receiving its wordclock via a BNC connection, the DA824, via its slot input.



The final example shows how the AD824 COM ports should be connected when several AD824s are used with the DME32.



# Troubleshooting

## DME32

Symptom	Advice
<b>Cannot turn on the DME32.</b>	Make sure that the power cord is connected to a suitable AC wall outlet. See “Connecting the Power Cord” on page 11 for more information.
	Make sure that the DME32 POWER switch is set to the ON position. See “Turning On & Off the DME32” on page 11 for more information.
	If you still cannot turn on the DME32, contact your Yamaha dealer.
<b>Cannot establish communication between the DME32 and DME Manager.</b>	Make sure that the DME32 is turned on, DME Manager is up and running, and the connecting cable is connected properly.
	If you are using a 9-pin serial connection, make that the PC Control switch setting on the rear of the DME32 conforms to the type of serial port on your PC: RS232C or RS422. Make sure that the serial port on your PC is working correctly. Open the System control panel and click the Device Manager tab. See your Windows documentation for further information.
	If you are using a 9-pin serial connection and the message “COM port open error 5” appears, open the “setup.ini” file in the DME folder with a text editor and make sure that the COM setting is correct. If you are using COM port 2, for example, the setting should be “COM2”. If that doesn’t help, check if another device is already using the COM port and disable it.
If you are using a USB connection, make sure that the USB port on your PC is working correctly. Open the System control panel and click the Device Manager tab. See your Windows documentation for further information.	
<b>Cannot select a configuration memory for recalling.</b>	Only configuration memories that contain data can be selected for recalling. See “Recalling Configurations” on page 198.
<b>The SCENE No. indicator is flashing.</b>	This is normal and indicates that a scene memory other than the one last recalled or stored is selected. See page 199 and page 200.
<b>The LOCK indicator is not lit.</b>	This means that the DME32 is not wordclock locked to the selected wordclock source. Select another wordclock source. See “Selecting the Wordclock Source” on page 229.
<b>The 48kHz and 44.1kHz indicators don’t light up.</b>	This is normal when an external wordclock source other than 48 kHz or 44.1 kHz is used.
<b>Cannot input or output audio.</b>	Check the I/O cards are installed properly and secured using the fixing screws. See “Installing I/O Cards” on page 255. See also “Checking the I/O Slots” on page 210.
<b>Noise occurs from the analog outputs when the wordclock source is changed on the wordclock master device.</b>	This is normal, although it’s more likely to occur if an MY8-AT I/O card is installed. To eliminate the risk of speaker damage, turn down your power amps, or turn off the DME32 beforehand.
<b>A scene or configuration is being recalled unknowingly.</b>	Is the scene or configuration assigned to a MIDI Program Change and being recalled by external MIDI messages? See “Assigning Scenes & Configurations to Program Changes” on page 244.
	Is the scene or configuration assigned to a GPI input and responding to an external trigger? See “Assigning GPI Inputs” on page 214.



Symptom	Advice
<b>A component parameter is being adjusted unknowingly.</b>	Is the parameter being adjusted in conjunction with another parameter in a link group? See "Linking Component Parameters" on page 78.
	Is the parameter assigned to a MIDI Control Change and responding to external MIDI messages? See "Assigning Component Parameters to Control Changes" on page 246.
	Is the parameter responding to Parameter Change messages from an external MIDI device? See "Component Parameters & Parameter Changes" on page 248.
	Is the parameter assigned to a GPI input? See "Assigning GPI Inputs" on page 214.
	Is the parameter assigned to the [USER DEFINE] button of another DME32? See "Assigning the User Define Button" on page 86.
<b>Cannot store or recall scenes or edit component parameters.</b>	Is Full Protect mode enabled? See "Using Full Protect" on page 205.
<b>Can recall scenes but cannot store them or edit component parameters.</b>	Is Scene Recall Only mode enabled? See "Using Scene Recall Only" on page 204.
<b>Forgotten the DME32 password.</b>	See "Initializing the DME32" on page 210.
<b>Cannot transmit or receive MIDI messages.</b>	Check the MIDI connections.
	Make sure the connected MIDI device is turned on and set to transmit and receive on the selected MIDI Channels.
	Check the settings on the MIDI Setup window. See "MIDI Settings" on page 242.
<b>MIDI Program Change messages do not recall scenes.</b>	Make sure that the DME32 is set to receive Program Change messages and that the MIDI Receive Channel setting is correct. See "MIDI Settings" on page 242.
	Check that the Program Change being transmitted is assigned to a scene. See "Assigning Scenes & Configurations to Program Changes" on page 244.
	Remember that only scenes that contain data can be recalled.
<b>MIDI Control Change messages do not control component parameters.</b>	Make sure that the DME32 is set to receive Control Change messages and that the MIDI Receive Channel setting is correct. See "MIDI Settings" on page 242.
	Check that the Control Change being transmitted is assigned to a component parameter. See "Assigning Component Parameters to Control Changes" on page 246.
<b>MIDI Parameter Change messages do not control component parameters.</b>	Make sure that the DME32 is set to receive Parameter Change messages. See "MIDI Settings" on page 242.
<b>In a multiple-unit system, the wordclock source can only be set on DME32 #1.</b>	This is correct. The other DME32s automatically receive their wordclock signals via the cascade connections.
<b>The EMERGENCY indicator is lit.</b>	This is because the GPI input assigned to emergency has been triggered. Investigate the cause and remove the emergency condition. See "Emergency Mode" on page 220.
<b>Multiple-unit operation does not work.</b>	Check the cascade connections between the DME32s. See "Cascade Connections" on page 237.

## DME Manager

Symptom	Advice
<b>Component control window movement is erratic in Windows 98.</b>	In Windows 98, open the Display control panel and click the Effects tab, and then turn off the "Show window contents while dragging" option.
<b>Components and wires are displayed out of alignment.</b>	In Windows 98, open the Display control panel, click the Settings tab, and then click Advanced. Click the General tab, and then set the Display Font Size to "Small Fonts." If you are using Windows 95, open the Display control panel, click the Settings tab, and then set Font to "Small Fonts." You may be prompted to restart your PC.
<b>Cannot add a component.</b>	Is DME Manager in Run or Cable mode? Components can be added only in Edit mode. See "Adding Components" on page 47.
	Is the DSP power meter showing 100%? See "Adding Components" on page 47.
	Does the configuration already contain a component of the type that you are trying to add? For certain components, such as input and output, only one component can be used in each configuration.
	Up to 159 of the same component can be added to any one configuration (e.g., 159 "Fader 4" components).
<b>Cannot add or delete a wire.</b>	Is DME Manager in Run or Edit mode? Wires can be added or deleted only in Cable mode. See "Adding Wires" on page 51.
<b>Cannot access the Run Mode Controller.</b>	The Run Mode Controller appears only when Run mode is selected.
<b>Cannot store a configuration from the Run Mode Controller.</b>	This is normal. Configurations cannot be stored using the Run Mode Controller. Use the Data Transfer window to transfer configurations. See "Sending Configurations to the DME32" on page 62.
<b>Cannot edit a component's controls.</b>	Is the component's Protect property checked? See "Customizing Component Properties" on page 80.
<b>Cannot compile a configuration.</b>	Compiling a configuration requires a small amount of DSP processing power. In some cases, compiling may fail even though the DSP power meter does not indicate 100%. This is because the DSP power meter displays approximate usage, and its accuracy is affected by the type of components in the configuration and the order in which they were added and wired. Delete any unnecessary components and try compiling again.
<b>Cannot see a component's title completely.</b>	Try making the title font smaller. See "Customizing Component Properties" on page 80.

# Appendix A: General

## Component Title Table

The following table shows how component titles appear on the Component List, component icons, and DME32 display. Apart from the Cascade components, the titles that appear on the component icons and the DME32 display are identical, although component icon titles can be customized. See “Customizing Component Properties” on page 80 for more information.

Component	Component List		Component Icon	DME32 Display
Automatic Mixer	2-Ch Auto Mixer		AutoMx2	AutoMx2
	4-Ch Auto Mixer		AutoMx4	AutoMx4
	8-Ch Auto Mixer		AutoMx8	AutoMx8
Cascade	1 to 16	1	1	1 Cascade
		2	2	2 Cascade
		3	3	3 Cascade
		4	4	4 Cascade
		5	5	5 Cascade
		6	6	6 Cascade
		7	7	7 Cascade
		8	8	8 Cascade
		9	9	9 Cascade
		10	10	10 Cascade
		11	11	11 Cascade
		12	12	12 Cascade
		13	13	13 Cascade
		14	14	14 Cascade
		15	15	15 Cascade
		16	16	16 Cascade
	17 to 32	17	17	17 Cascade
		18	18	18 Cascade
		19	19	19 Cascade
		20	20	20 Cascade
		21	21	21 Cascade
		22	22	22 Cascade
		23	23	23 Cascade
		24	24	24 Cascade
		25	25	25 Cascade
		26	26	26 Cascade
		27	27	27 Cascade
		28	28	28 Cascade
		29	29	29 Cascade
		30	30	30 Cascade
		31	31	31 Cascade
		32	32	32 Cascade

Component	Component List		Component Icon	DME32 Display
<b>Crossover</b>	2-Way 12dB/oct		2way 12dB/oct	2way 12dB/oct
	2-Way 24dB/oct		2way 24dB/oct	2way 24dB/oct
	2-Way 36dB/oct		2way 36dB/oct	2way 36dB/oct
	2-Way 48dB/oct		2way 48dB/oct	2way 48dB/oct
	3-Way 12dB/oct		3way 12dB/oct	3way 12dB/oct
	3-Way 24dB/oct		3way 24dB/oct	3way 24dB/oct
	3-Way 36dB/oct		3way 36dB/oct	3way 36dB/oct
	3-Way 48dB/oct		3way 48dB/oct	3way 48dB/oct
	4-Way 12dB/oct		4way 12dB/oct	4way 12dB/oct
	4-Way 24dB/oct		4way 24dB/oct	4way 24dB/oct
	4-Way 36dB/oct		4way 36dB/oct	4way 36dB/oct
	4-Way 48dB/oct		4way 48dB/oct	4way 48dB/oct
<b>Crossover Processor</b>	2-Way Processor		2wayProcessor	2wayProcessor
	3-Way Processor		3wayProcessor	3wayProcessor
	4-Way Processor		4wayProcessor	4wayProcessor
<b>Delay</b>	Delay 1 Out		Delay 1out	Delay 1out
	Delay 2 Out		Delay 2out	Delay 2out
	Delay 3 Out		Delay 3out	Delay 3out
	Delay 4 Out		Delay 4out	Delay 4out
	Delay 5 Out		Delay 5out	Delay 5out
	Delay 6 Out		Delay 6out	Delay 6out
	Delay 7 Out		Delay 7out	Delay 7out
	Delay 8 Out		Delay 8out	Delay 8out
<b>Delayed Mixer</b>	2x	Delayed Mixer 2x2	Dly202	Dly202
		Delayed Mixer 2x4	Dly204	Dly204
		Delayed Mixer 2x8	Dly208	Dly208
		Delayed Mixer 2x12	Dly212	Dly212
	4x	Delayed Mixer 4x2	Dly402	Dly402
		Delayed Mixer 4x4	Dly404	Dly404
		Delayed Mixer 4x8	Dly408	Dly408
		Delayed Mixer 4x12	Dly412	Dly412
		Delayed Mixer 4x16	Dly416	Dly416
	8x	Delayed Mixer 8x2	Dly802	Dly802
		Delayed Mixer 8x4	Dly804	Dly804
		Delayed Mixer 8x8	Dly808	Dly808
		Delayed Mixer 8x12	Dly812	Dly812
Delayed Mixer 8x16		Dly816	Dly816	

Component	Component List	Component Icon	DME32 Display
<b>Dynamics</b>	Compander	Compander	Compander
	Compressor	Compressor	Compressor
	De-Esser	De-Esser	De-Esser
	Ducker	Ducker	Ducker
	Expander	Expander	Expander
	Gate	Gate	Gate
	Stereo Compander	StCompander	StCompander
	Stereo Compressor	StCompressor	StCompressor
	Stereo De-Esser	StDe-Esser	StDe-Esser
	Stereo Ducker	StDucker	StDucker
	Stereo Expander	StExpander	StExpander
	Stereo Gate	StGate	StGate
<b>Effect</b>	Reverb Hall	RevHall	RevHall
	Reverb Room	RevRoom	RevRoom
	Reverb Stage	RevStage	RevStage
	Reverb Plate	RevPlate	RevPlate
	Early Ref.	EarlyRef	EarlyRef
	Gate Reverb	GateReverb	GateReverb
	Reverse Gate	ReverseGate	ReverseGate
	Mono Delay	MonoDly	MonoDly
	Stereo Delay	St_Dly	St_Dly
	Mod Delay	Mod_Dly	Mod_Dly
	Delay LCR	Dly_LCR	Dly_LCR
	Echo	Echo	Echo
	Chorus	Chorus	Chorus
	Flange	Flange	Flange
	Symphonic	Symphonic	Symphonic
	Phaser	Phaser	Phaser
	Auto Pan	AutoPan	AutoPan
	Tremolo	Tremolo	Tremolo
	HQ Pitch	HqPitch	HqPitch
	Dual Pitch	DuPitch	DuPitch
Mod. Filter	ModFilter	ModFilter	
Dyna.Filter	DynFilter	DynFilter	
Dyna.Flange	DynFlange	DynFlange	
<b>EQ</b>	2-Band PEQ	PEQ 2	PEQ 2
	3-Band PEQ	PEQ 3	PEQ 3
	4-Band PEQ	PEQ 4	PEQ 4
	6-Band PEQ	PEQ 6	PEQ 6
	8-Band PEQ	PEQ 8	PEQ 8
	7-Band GEQ	GEQ 7	GEQ 7
	15-Band GEQ	GEQ 15	GEQ 15
	31-Band GEQ	GEQ 31	GEQ 31

Component	Component List		Component Icon	DME32 Display
Fader	Fader 1		Fader 1	Fader 1
	Fader 2		Fader 2	Fader 2
	Fader 4		Fader 4	Fader 4
	Fader 8		Fader 8	Fader 8
	Fader 12		Fader12	Fader12
	Fader 16		Fader16	Fader16
Filter	HPF		HPF	HPF
	LPF		LPF	LPF
	BPF		BPF	BPF
	Notch		Notch	Notch
Input/Output	Input	Slot 1 In (1-8)	Slot1 In(1-8)	Slot1 In(1-8)
		Slot 2 In (9-16)	Slot2 In(9-16)	Slot2 In(9-16)
		Slot 3 In (17-24)	Slot3 In(17-24)	Slot3 In(17-24)
		Slot 4 In (25-32)	Slot4 In(25-32)	Slot4 In(25-32)
	Output	Slot 1 Out (1-8)	Slot1 Out(1-8)	Slot1 Out(1-8)
		Slot 2 Out (9-16)	Slot2 Out(9-16)	Slot2 Out(9-16)
		Slot 3 Out (17-24)	Slot3 Out(17-24)	Slot3 Out(17-24)
		Slot 4 Out (25-32)	Slot4 Out(25-32)	Slot4 Out(25-32)
Matrix Mixer	2x	Mixer 2x1	Mix201	Mix201
		Mixer 2x2	Mix202	Mix202
	4x	Mixer 4x1	Mix401	Mix401
		Mixer 4x2	Mix402	Mix402
		Mixer 4x4	Mix404	Mix404
	8x	Mixer 8x1	Mix801	Mix801
		Mixer 8x2	Mix802	Mix802
		Mixer 8x4	Mix804	Mix804
		Mixer 8x8	Mix808	Mix808
	12x	Mixer 12x1	Mix1201	Mix1201
		Mixer 12x2	Mix1202	Mix1202
		Mixer 12x4	Mix1204	Mix1204
		Mixer 12x8	Mix1208	Mix1208
		Mixer 12x12	Mix1212	Mix1212
	16x	Mixer 16x1	Mix1601	Mix1601
		Mixer 16x2	Mix1602	Mix1602
Mixer 16x4		Mix1604	Mix1604	
Mixer 16x8		Mix1608	Mix1608	
Mixer 16x12		Mix1612	Mix1612	
Meter	Meter 1		Meter 1	Meter 1
	Meter 2		Meter 2	Meter 2
	Meter 4		Meter 4	Meter 4
	Meter 8		Meter 8	Meter 8
	Meter 12		Meter12	Meter12
	Meter 16		Meter16	Meter16
Misc	Gain Trimmer		GainTrm	GainTrm
	Oscillator		Oscillator	Oscillator
	System Mute		SysMute	SysMute

Component	Component List	Component Icon	DME32 Display	
<b>Pan</b>	LCR	LCR	LCR	
	Pan	Pan	Pan	
	Surround 2+2	Surr2+2	Surr2+2	
	Surround 3+1	Surr3+1	Surr3+1	
	Surround 5.1	Surr5.1	Surr5.1	
<b>Router</b>	1x	Router 1x2	Rtr102	Rtr102
		Router 1x4	Rtr104	Rtr104
		Router 1x8	Rtr108	Rtr108
		Router 1x12	Rtr112	Rtr112
		Router 1X16	Rtr116	Rtr116
	2x	Router 2x1	Rtr201	Rtr201
		Router 2x2	Rtr202	Rtr202
		Router 2x4	Rtr204	Rtr204
		Router 2x8	Rtr208	Rtr208
		Router 2x12	Rtr212	Rtr212
	4x	Router 2x16	Rtr216	Rtr216
		Router 4x1	Rtr401	Rtr401
		Router 4x2	Rtr402	Rtr402
		Router 4x4	Rtr404	Rtr404
		Router 4x8	Rtr408	Rtr408
	8x	Router 4x12	Rtr412	Rtr412
		Router 4x16	Rtr416	Rtr416
		Router 8x1	Rtr801	Rtr801
		Router 8x2	Rtr802	Rtr802
		Router 8x4	Rtr804	Rtr804
	12x	Router 8x8	Rtr808	Rtr808
		Router 8x12	Rtr812	Rtr812
		Router 8x16	Rtr816	Rtr816
		Router 12x1	Rtr1201	Rtr1201
		Router 12x2	Rtr1202	Rtr1202
	16x	Router 12x4	Rtr1204	Rtr1204
		Router 12x8	Rtr1208	Rtr1208
		Router 12x12	Rtr1212	Rtr1212
		Router 12x16	Rtr1216	Rtr1216
		Router 16x1	Rtr1601	Rtr1601
Switch	Router 16x2	Rtr1602	Rtr1602	
	Router 16x4	Rtr1604	Rtr1604	
	Router 16x8	Rtr1608	Rtr1608	
	Router 16x12	Rtr1612	Rtr1612	
	Router 16x16	Rtr1616	Rtr1616	
<b>Switch</b>	Switch 1	Sw 1	Sw 1	
	Switch 2	Sw 2	Sw 2	
	Switch 4	Sw 4	Sw 4	
	Switch 8	Sw 8	Sw 8	
	Switch 12	Sw 12	Sw 12	
	Switch 16	Sw 16	Sw 16	
<b>User Control</b>		UserCtrl	UserCtrl	
<b>User Module</b>		UserModule	UserModule	

## DME32 Error Messages

If the DME32 displays an error message, look for the solution in the following table.

Message	Reason	Solution
***** WARNING ***** LOW BATTERY	The internal battery has expired.	Save the configurations to DME Manager or a PC Card, and then ask your Yamaha dealer to replace the battery.
ABORTED-TooMany Errors!	Several errors occurred while trying to download the firmware.	Try downloading again.
Application Prog Error!	The application program is not registered in the flash ROM.	Register the application program in the flash ROM.
CASCADE ERR (My ID: )	When the DME32 is turned on, it checks its ID number. If this number does not match, a connection error occurs.	Make sure the cascade cables are connected in the proper order.
CPU Address Error!	An SH2 error trap occurred.	
DMA Address Error!		
DME I/F ERR	Communication failed between DME32s in a multiple-unit system. Perhaps a cascade cable has been disconnected, or a DME32 is not turned on.	Check the cascade cables, and make sure all DME32s are turned on.
Ext RAM Read/Write err!	An error occurred while reading or writing to the external RAM.	
Flash ROM checksum err!	A flash ROM write error occurred.	
Flash ROM device err!	A manufacture or device code error occurred.	
Flash ROM Write Error!	An SH2 error trap occurred.	
Flash ROM write error!	A flash ROM erase error occurred.	
Illegal Instruction!	An SH2 error trap occurred.	
Illegal interrupt!		
Illegal slot!		
NMI Request!		
TIME OUT ERR	When a multiple-unit DME32 system is turned on, DME32s with a cable connected to their CASCADE IN wait for connection confirmation from the next DME32. If this confirmation is not received within 10 seconds, a time out error occurs.	Ensure that cascaded DME32s are turned on within 10 seconds of each other. Make sure that all DME32s are turned on. Make sure the cascade cables are connected properly.
Unexpected vector!	An SH2 error trap occurred.	
User Break!		



## DME Manager Error Messages

If DME Manager displays an error message, look for the solution in the following table.

Message	Reason	Solution
<b>Cannot compile because configuration contains no components!</b>	An attempt was made to compile a configuration that contains no components.	Add some components, and then try compiling again.
<b>Cannot display more than 32 meters!</b>	An attempt was made to display more than 32 meters.	A maximum of 32 meters can be displayed simultaneously.
<b>COM port open error 5</b>	The COM port is in use by another device.	Disable the device using the COM port.
		Open the "setup.ini" file in the DME folder and make sure that the COM setting is correct. If you are using com port 2, for example, the setting should be "COM2".
<b>Component position error!</b>	An error occurred while trying to display the configuration.	Try opening the configuration again, or try receiving it from the DME32 again.
<b>Configuration must be compiled before saving!</b>	An attempt was made to save a configuration that has not been compiled.	Compile the configuration, and then try saving again.
<b>Configuration must be compiled before sending!</b>	An attempt was made to send an uncompiled configuration to the DME32.	Compile the configuration, and then try sending again.
<b>DME32 and DME Manager configurations do not match!</b>	The DME Manager and DME32 configuration data does not match.	Match the data, and then try sending the configuration again.
<b>DME32 not found!</b>	The DME32 was not detected when DME Manager was started.	Continue using only DME Manager, or check the DME32 connection and restart DME Manager.
<b>Error reading file!</b>	An error occurred while trying to open a file. Perhaps the file is already in use, or has not yet been saved.	Check if the file is already in use, or check if it has been saved, and then try opening again.
<b>Error receiving configuration!</b>	An error occurred while receiving a configuration from the DME32.	Check the DME32 connection, and then try receiving again.
<b>Error sending configuration!</b>	An error occurred while sending a configuration to the DME32.	Check the DME32 connection, and then try sending again.
<b>Error writing file!</b>	An error occurred while trying to write to a file. Perhaps it's in use, or is write protected.	Enter another file name, or turn off the write protection, and then try saving again.
<b>Grid spacing is too large or too small!</b>	The specified grid spacing is too large or too small.	Enter a grid spacing within the valid range.
<b>Incorrect password!</b>	The password entered was incorrect.	Enter the correct password.
<b>No configuration selected!</b>	An attempt was made to send a configuration, but no configuration was selected.	Select a configuration, and then try sending again.
<b>"NO DATA" is an invalid file name!</b>	"NO DATA" cannot be used as a file name.	Enter a file name other than "NO DATA".
<b>Not a DME file!</b>	An attempt was made to open a file other than a DME file.	Open, and drag open only DME files
<b>Printer setup error!</b>	An error occurred while trying to read the printer setup information. Perhaps the printer is not set up correctly, or a suitable driver is not available.	Set up the printer correctly.

Message	Reason	Solution
<b>The DME32 configuration data has changed. Receive data from DME32?</b>	The configuration data has changed on the DME32. This may due, for example, to the wordclock setting being changed from the front panel, or a configuration being loaded from a PC Card.	Click OK to receive the updated configuration data from the DME32.
<b>This component is protected!</b>	An attempt was made to edit a protected component.	Turn off the component's protection, and then try editing again.
<b>This operation is protected!</b>	An attempt was made to use a protected operation.	Turn off the Operation or Component protection, and then try again.
<b>Too many components for DME32 #!</b>	The maximum number of components for the specified DME32 has been exceeded.	Delete any unused components in order to free up resources, and then add the new component.
<b>You must enter a title for the configuration!</b>	An attempt was made to send a configuration, but no configuration was selected, or no title was entered.	Select a configuration, or enter a title, and then try sending again.
<b>You must enter a title for the user module!</b>	An attempt was made to save a user module, but no title was entered.	Enter a title, and then try saving again.
<b>Available resources are low. Further editing is not recommended. Delete some components or restart the program to resolve the problem.</b>	This message warns that Windows resources are getting low, perhaps because there are many configuration windows open, or several programs are running simultaneously. If you continue using DME Manager, Windows may suddenly quit DME Manager.	Close some configuration windows, quit some other programs, or restart DME Manager.

# Appendix B: Specifications

## Specifications

Sampling frequency	Internal	48 kHz
	External	39.69–50.88 kHz
Signal delay		0.21 ms (direct cable from input 1 to output 1, fs = 48 kHz)
Memories	Configuration	2 (A, B)
	Scene	99 per configuration
Display		24-character x2 line LCD, with backlight
Scene No.		7-segment LED x2
Indicators	Wordclock	48kHz, 44.1kHz, LOCK
	Emergency mode	EMERGENCY
	Others	COMPONENT, PARAMETER, VALUE, PROTECT, UTILITY, USER DEFINE
PC Card slot		PCMCIA Type II memory cards
Power requirements		U.S.A. & Canada 120 V AC, 60 Hz Europe 230 V AC, 50 Hz
Power consumption		40 W
Dimensions (W × H × D)		480 × 141.5 × 375.2 mm (18.9 × 5.6 × 14.8 inches), 3U
Weight		9.5 kg (21 lbs)
Free-air operating temperature		10° C to 35° C (50° F to 95° F)
Storage temperature		–20° C to 60° C (–4° F to 140° F)
Power cord length		2.5 m
Supplied accessories		Power cord, CD-ROM (DME Manager program), 9-pin D-sub crossed cable, 16-pin Euro-block plug, Owner's Manual
Options		MY8, MY4 mini YGDAI I/O cards

## Control I/O

Connection	Format	Level	Connector
WORD CLOCK INPUT	—	TTL 75Ω (ON/OFF)	BNC
WORD CLOCK OUTPUT	—	TTL	BNC
MIDI IN	MIDI	—	5-pin DIN
MIDI OUT	MIDI	—	5-pin DIN
CASCADE IN	—	—	Half pitch 50-pin
CASCADE OUT	—	—	Half pitch 50-pin
USB	USB	—	USB Type B male
PC CONTROL	—	RS232C/RS422	9-pin D-sub
COM	—	RS422	9-pin D-sub
GPI IN (x16)	—	0–5 V	Euro block
GPI OUT (x16)	—	0–5 V	Euro block
GPI +V (x16)	—	6 mA max	Euro block
SLOT (x4)	mini YGDAI	—	—

## Connector Pin Assignments

### PC CONTROL (RS232C)

Pin	Name	In/Out	Pin	Name	In/Out
1	Unused	—	6	DSR	In
2	RxD	In	7	RTS	Out
3	TxD	Out	8	CTS	In
4	DTR	Out	9	Unused	—
5	GND	—			

### PC CONTROL (RS422)

Pin	Name	In/Out	Pin	Name	In/Out
1	Unused	—	6	Rx+	In
2	Rx–	In	7	RTS	Out
3	Tx–	Out	8	CTS	In
4	Tx+	Out	9	Unused	—
5	GND	—			

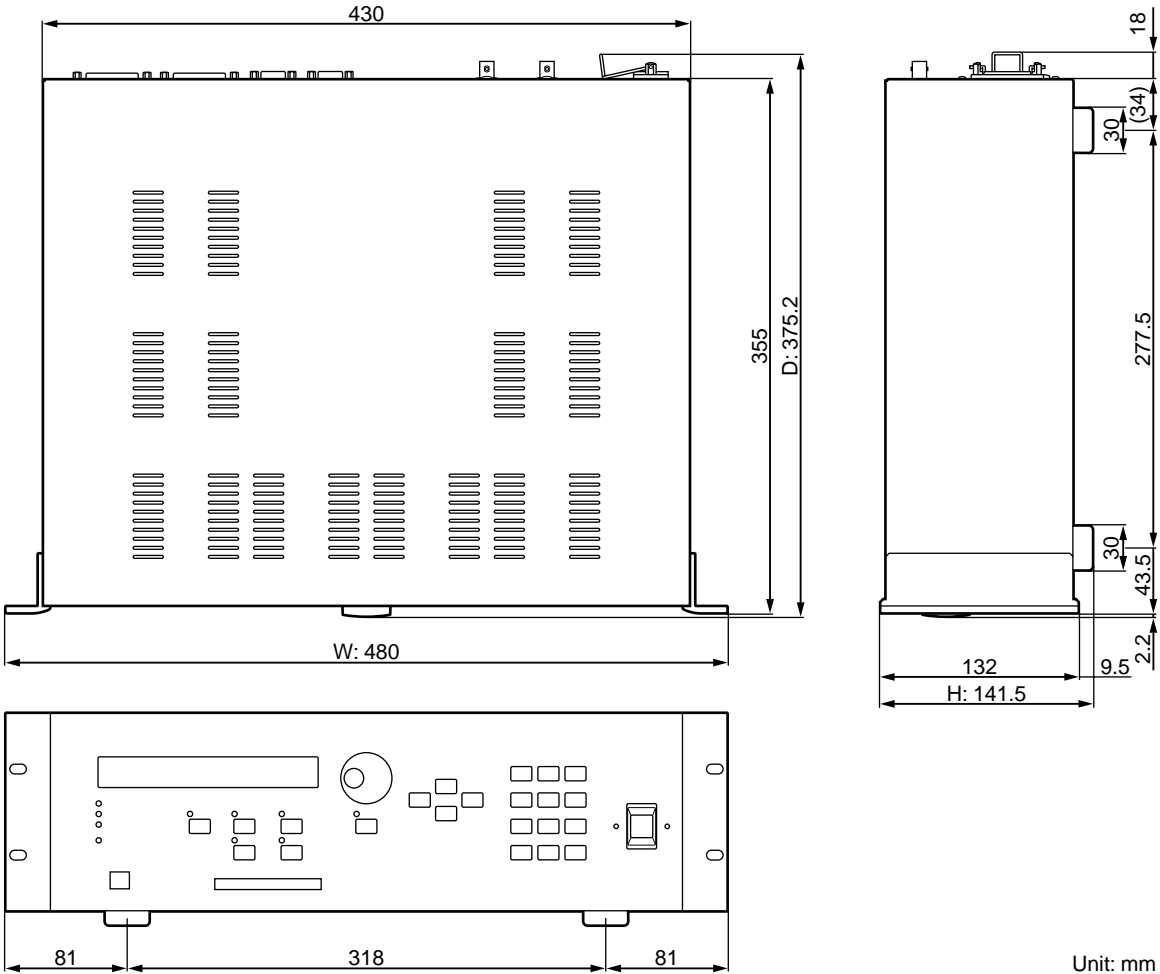
**CASCADE OUT**

Pin	Name	Pin	Name
1	GND	26	GND
2	Bus 1–4 in+	27	Bus 1–4 in–
3	Bus 5–8 in+	28	Bus 5–8 in–
4	Bus 9–12 in+	29	Bus 9–12 in–
5	Bus 13–16 in+	30	Bus 13–16 in–
6	Bus 17–20 in+	31	Bus 17–20 in–
7	Bus 21–24 in+	32	Bus 21–24 in–
8	Bus 25–28 in+	33	Bus 25–28 in–
9	Bus 29–32 in+	34	Bus 29–32 in–
10	GND	35	GND
11	Sum 1–4 out+	36	Sum 1–4 out–
12	Sum 5–8 out+	37	Sum 5–8 out–
13	Sum 9–12 out+	38	Sum 9–12 out–
14	Sum 13–16 out+	39	Sum 13–16 out–
15	Sum 17–20 out+	40	Sum 17–20 out–
16	Sum 21–24 out+	41	Sum 21–24 out–
17	Sum 25–28 out+	42	Sum 25–28 out–
18	Sum 29–32 out+	43	Sum 29–32 out–
19	Wordclock out	44	Wordclock in
20	GND	45	GND
21	Control Rx+	46	Control Rx–
22	Control Tx+	47	Control Tx–
23	ID out	48	GND
24	ID out (GND)	49	GND
25	GND	50	GND

**CASCADE IN**

<b>Pin</b>	<b>Name</b>	<b>Pin</b>	<b>Name</b>
1	GND	26	GND
2	Bus 1–4 out+	27	Bus 1–4 out–
3	Bus 5–8 out+	28	Bus 5–8 out–
4	Bus 9–12 out+	29	Bus 9–12 out–
5	Bus 13–16 out+	30	Bus 13–16 out–
6	Bus 17–20 out+	31	Bus 17–20 out–
7	Bus 21–24 out+	32	Bus 21–24 out–
8	Bus 25–28 out+	33	Bus 25–28 out–
9	Bus 29–32 out+	34	Bus 29–32 out–
10	GND	35	GND
11	Sum 1–4 in+	36	Sum 1–4 in–
12	Sum 5–8 in+	37	Sum 5–8 in–
13	Sum 9–12 in+	38	Sum 9–12 in–
14	Sum 13–16 in+	39	Sum 13–16 in–
15	Sum 17–20 in+	40	Sum 17–20 in–
16	Sum 21–24 in+	41	Sum 21–24 in–
17	Sum 25–28 in+	42	Sum 25–28 in–
18	Sum 29–32 in+	43	Sum 29–32 in–
19	Wordclock in	44	Wordclock out
20	GND	45	GND
21	Control Tx+	46	Control Tx–
22	Control Rx+	47	Control Rx–
23	ID in (GND)	48	GND
24	ID in	49	GND
25	GND	50	GND

# DME32 Dimensions



Specifications and external appearance subject to change without notice.

For European Model  
Purchaser/User Information specified in EN55103-1 and EN55103-2.  
Inrush Current: 13A  
Conformed Environment: E1, E2, E3 and E4

# Appendix C: MIDI

## Program Change Assign Table

Program Change	Scene/ Configuration
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	

Program Change	Scene/ Configuration
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	

Program Change#	Scene/ Configuration
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	
101	
102	
103	
104	
105	
106	
107	
108	
109	
110	
111	
112	
113	
114	
115	
116	
117	
118	
119	
120	
121	
122	
123	
124	
125	
126	
127	
128	



## Control Change Assign Table

Control Change	Unit	Component	Sub. No	Parameter	Pair
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					

Control Change	Unit	Component	Sub. No	Parameter	Pair
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
77					
78					
79					
80					
81					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					

Control Change	Unit	Component	Sub. No	Parameter	Pair
95					
96					
97					
98					
99					
100					
101					
102					
103					
104					
105					
106					
107					
108					
109					
110					
111					
112					
113					
114					
115					
116					
117					
118					
119					

# MIDI Data Format

## 1. Transmit/Receive Data

### 1.1 Program Change

When a Program Change message is received, the scene specified in the [Program Change Assign Table] is recalled.

Program Change messages are transmitted according to the [Program Change Assign Table]. If a scene memory number has been assigned to more than one Program Change, the lowest-numbered Program Change is transmitted.

### 1.2 Control Change

When a Control Change message is received, the parameter specified in the [Control Change Assign Table] is edited.

When a parameter specified in the [Control Change Assign Table] is edited, a Control Change message for that control change number is transmitted. If a parameter has been assigned to more than one Control Change, the lowest-numbered Control Change is transmitted.

### 1.3 Parameter Change

Parameter value changes are transmitted and received. If [Parameter Change Tx] is ON, these messages are transmitted when the value of a parameter is changed. These messages can be received when [Parameter Change Rx] is ON.

## 2. DME32 Settings and Operation

### 2.1 MIDI Setup

#### 2.1.1 MIDI Channel

##### 2.1.1.1 Transmit Channel

Specify the MIDI channel for transmission.

##### 2.1.1.2 Receive Channel

Specify the MIDI channel that will be used for reception. As a rule, MIDI messages are received only if the MIDI channel matches, but this is not the case if OMNI is ON.

#### 2.1.2 ON/OFF

##### 2.1.2.1 Program Change

Enable or disable reception and transmission. If OMNI is ON, these messages are received regardless of the MIDI channel. If ECHO is ON, they are echoed regardless of the channel.

##### 2.1.2.2 Control Change

Enable or disable reception and transmission. If OMNI is ON, these messages are received regardless of the MIDI channel. If ECHO is ON, they are echoed regardless of the channel.

##### 2.1.2.3 Parameter Change

Enable or disable reception and transmission. If ECHO is ON, these messages are echoed regardless of the channel.

## 2.2 MIDI Program Change Assign Table

This table allows the free assignment of scene memories to Program Changes.

## 2.3 MIDI Control Change Assign Table

This table allows the free assignment of parameters to Control Changes. This is used both for reception and for transmission. If TX is ON, these messages are transmitted when the assigned parameter is edited.

## 3. MIDI Format Table

### 3.1 Channel Message

Command	rx/tx	Function
Bn Control Change	rx/tx	Parameter control (according to Control Change Assign Table)
Cn Program Change	rx/tx	Scene memory change (according to Program Change Assign table)

### 3.2 Parameter Change

Parameter type	rx/tx	Function
0x00	rx/tx	edit buffer (byte operation format)

## 4. MIDI Format Detailed Specification

### 4.1 Control Change (Bn)

#### Reception

These messages are received if [Control Change RX] is ON and the [Rx CH] matches. However if [OMNI] is ON, these messages are received regardless of the channel.

These messages are echoed if [Control Change ECHO] is ON.

Parameters are controlled according to the [Control Change Assign Table].

#### Transmission

If [Control Change TX] is ON, these messages are transmitted on the [Tx CH] when a parameter specified in the [Control Change Assign Table] is modified.

If [Control Change ECHO] is ON, these messages are merged with those output by the unit itself, while taking advantage of running status.

STATUS	1011nnnn Bn	Control Change
DATA	0ccccccc cc	Control No. (0-119)
	0vvvvvvvv vv	Control Value (0-127)

Control values are converted into parameter values according to the following equation.

$$C = 128 \text{ (byte parameter)}$$

$$16384 \text{ (word parameter)}$$

S = total number of variable steps for the parameter

$$C / S = X \text{ remainder } Y$$

$$\text{INT} ((Y+1)/2) = Z$$

```

If (MIDI DATA - Z) < 0           → param = 0
If ((MIDI DATA - Z)/X) > MAX     → param = MAX
Otherwise                          → param = INT ((MIDI DATA -Z)/X

```

## 4.2 Program Change (Cn)

### Reception

These messages are received if [Program Change RX] is ON and the [Rx CH] matches. However, if [OMNI] is ON, they are received regardless of the channel.

These messages are echoed if [Program Change ECHO] is ON.

Scene memories are recalled according to the [Program Change Assign Table].

### Transmission

If [Program Change TX] is ON, this message is transmitted on the [Tx CH] according to the settings of the [Program Change Assign Table] when a scene is recalled.

If the scene memory number that was recalled is assigned to more than one Program Change, the lowest-numbered Program Change is transmitted.

If [Program Change ECHO] is ON, these messages are echoed.

STATUS	1100nnnn Cn	Program Change
DATA	0nnnnnnn nn	Program No. (0-127)

## 4.3 Parameter Change (byte operation for type 0x00: edit buffer)

### Reception

These messages are received if [Parameter Change RX] is ON and the [Rx CH] matches the Device Channel included in the SUB STATUS of the message.

These messages are echoed if [Parameter Change ECHO] is ON.

When these messages are received, the corresponding parameter is controlled.

### Transmission

If [Parameter Change TX] is ON, this message is transmitted on the [Tx CH] Device Channel when a parameter not specified in the [Control Change Assign Table] is adjusted.

These messages are transmitted without change if [Parameter Change ECHO] is ON.

STATUS	11110000 F0	System Exclusive Message
ID No.	01000011 43	Manufacturer's ID No. (YAMAHA)
SUB STATUS	0001nnnn 1n	parameter change or response for request n=0-15 (Device Channel No.1-16)
GROUP ID	00111110 3E	group ID (digital mixer)
MODEL ID	00000101 05	Device code (DME32)
PARAM TYPE	00000000 00	byte operation for edit buffer
DATA	0000aaaa dd1	Parameter No. (H high order bit)
	0000bbbb dd2	Parameter No. (H low order bit)
	0000cccc dd3	Parameter No. (L high order bit)
	0000dddd dd4	Parameter No. (L low order bit)
	0000eeee dd5	Parameter value (H high order bit)
	0000ffff dd6	Parameter value (H low order bit)
	0000gggg dd7	Parameter value (L high order bit)
	0000hhhh dd8	Parameter value (L low order bit)
EOX	11110111 F7	End Of Exclusive

---

# Glossary

---

**ADAT interconnect format**—The digital audio interconnect format typically found on ADAT-compatible digital audio equipment. Eight channels of digital audio are carried per fiber-optic connection using Toslink connectors.

**AES/EBU interconnect format**—The digital audio interconnect format, established by the AES (Audio Engineering Society) and EBU (European Broadcasting Union), for transferring digital audio data between professional digital audio equipment. Two channels of digital audio (left/odd and right/even) are carried per balanced line.

**Bessel**—A type of filter characterized by its virtually linear phase response (i.e., the amount of phase change is the same for all frequencies within the pass band). Although it has a more gradual roll off than a Butterworth filter, it will pass a square wave without causing ringing. *See also* Butterworth and Linkwitz-Riley.

**Butterworth**—Being the most common type of filter, filters are typically always Butterworth, unless otherwise stated. It has a flat pass band and a -3 dB gain at the cutoff frequency. *See also* Bessel and Linkwitz-Riley.

**Cable mode**—The DME Manager mode for wiring components.

**Compiling**—The process of translating a configuration into information that the DME32 can understand. Configurations must be compiled before they can be saved or transferred to the DME32.

**Component**—Components form the building blocks in DME32 configurations. Some components are complete audio processors, such as mixers, compressors, effects, and crossovers, while others are individual parts, such as faders, switches, pan controls, and meters. Custom components can be created using User modules.

**Configuration**—The arrangement of components and wires that make up a DME32 audio system. The DME32 can store two configurations: A and B.

**DSP (Digital Signal Processor)**—A chip designed specifically for processing large amounts of data at high speed and in real time, ideal for digital audio processing.

**Edit mode**—The DME Manager mode used to build and edit configurations. Also used to edit and preview scenes offline.

**Emergency mode**—The mode in which all DME32 outputs are muted and the EMERGENCY indicator lights up. One GPI input can be assigned to emergency, and when that input is triggered, Emergency mode is engaged.

**Firmware**—Software that is stored in Read-Only Memory (ROM). The DME32's system software is stored in flash ROM, a special type of memory that can be reprogrammed.

**FS**—Abbreviation for sampling frequency or rate.

**GPI (General Purpose Interface)**—The DME32 GPI interface allows remote interaction with custom-made controllers and other equipment, with 16 GPI inputs and 16 GPI outputs.

**Initial settings**—The settings used when a device is first turned on after leaving the factory. Also known as the default, or factory settings.

**Linkwitz-Riley**—This filter offers slopes of 12 dB, 24 dB, 48 dB, etc. When the output signal from its LPF and HPF are combined, the gain over the entire range is flat. Like the Butterworth filter, it has a flat pass band. The gain at the cutoff frequency is -6 dB. *See also* Bessel and Butterworth.

**MIDI (Musical Instrument Digital Interface)**—The standard digital interface for remotely controlling electronic musical systems and audio equipment.

**mini YGDAI (Yamaha General Digital Audio Interface)**—The second-generation YGDAI interface system used on the 01V Digital Mixing Console, D24 Digital Multitrack Recorder, and DME32 Digital Mixing Engine.

**Oversampling**—A technique used to reduce noise due to quantization errors in which audio is sampled at a rate much higher than the nominal sampling rate.

**PC Card**—A small, credit card-sized device for use with personal computers and other electronic devices. PC Cards come in three thicknesses, the thinnest being Type I, which is typically used for RAM or ROM memory. Type II cards, which are slightly thicker, may contain, for example, a fax/modem, while Type III cards are thick enough to contain a hard disk drive.

**PCMCIA (Personal Computer Memory Card International Association)**—The organization responsible for the development of the PC Card standard.

**RS232C**—An interface for connecting serial devices, offering a transmission distance of approximately 15 meters, typically using 9- or 25-pin D-Sub connectors.

**RS422**—A balanced interface for connecting serial devices, offering a transmission distance of approximately 1 kilometer, higher data rates, and greater immunity to interference than RS232C.

**Run mode**—The DME Manager mode used to control the DME32 system in real time, which includes editing component parameters, storing and recalling scenes, and recalling configurations.

**Sampling rate** — The number of times per second an analog audio signal is sampled (i.e., measured) during A/D conversion.

**Scene**—A DME32 scene contains a snapshot of all component-parameter settings. Up to 99 scenes can be stored in each configuration.

**Tascam TDIF-1 interconnect format**—The Tascam Digital InterFace audio interconnect format typically found on Tascam TDIF-1-compatible digital audio equipment. TDIF-1 is a bidirectional, 8-channel format, which uses 25-pin D-sub connectors.

**USB (Universal Serial Bus)**—A serial bus for connecting external devices to personal computers, offering data transfer rates of up to 12 Mbps.

**WC**—An abbreviation for wordclock.

**Wordclock**—A clock signal used to synchronize the data processing circuits of all devices in a digital audio system.

**YGDAI (Yamaha General Digital Audio Interface)**—The digital audio interface system that offers a range of analog and digital input and output options for Yamaha digital audio equipment.



# Index

## Symbols

+V, GPI terminal 212

## Numerics

2-way crossover components 94

2-way crossover processor  
component 102

3-way crossover components 96

3-way crossover processor  
component 107

44.1kHz indicator 17

48kHz indicator 17

4-way crossover components 99

4-way crossover processor  
component 112

75Ω ON/OFF switch 19

## A

About command 38

AC IN connector  
about 19  
using 11

AD824 A/D converter 256

ADAT format  
definition 287  
I/O cards 252

Adding

components 47  
individual wires 51  
multiple wires 53  
parameter link groups 78  
parameters to link groups 78

AES/EBU format  
definition 287  
I/O cards 252

Align command 35

Aligning components 49

Alt menu 41

Analog I/O 252

Applying

parameter link settings 78  
USER DEFINE button 86

Assigning

component parameters to  
control changes 246  
configurations to program  
changes 244

GPI inputs 214

GPI outputs 217

scenes to program changes 244

USER DEFINE button 86

Auto pan component 155

Automatic mixer components 90

## B

Battery voltage 210

BPF component 168

Bring to front 80

Building

configurations 44

user controls 191

user modules 193

Buttons 32

## C

Cable mode

about 22

definition 287

selecting 51

Cable tool 31

CARD eject button 18

CARD slot

about 17

using 222

Cascade

components 92

connections 237

hookup examples 238

using 236

CASCADE IN

about 20

pin assignments 276

using 237

CASCADE OUT

about 20

pin assignments 275

using 237

Chorus component 151

Close command 34

Closing configurations 60

Color, component setting 80

COM port

about 19

using 256

Compander component 125

Compile command 34

Compiling

configurations 61

definition 287

COMPONENT button and

indicator 17

Component list 40

Component list command 37

Component menu 37

Component password 83

Components

2-way crossover 94

2-way crossover processor 102

3-way crossover 96

3-way crossover processor 107

4-way crossover 99

4-way crossover processor 112

about 30

about control windows 31

adding 47

aligning 49

Auto pan 155

Automatic mixer 90

BPF 168

Cascade 92

changing control size 82

Chorus 151

Compander 125

component list 40

Compressor 128

Crossover 93

Crossover processor 102

customizing appearance 80

De-esser 131

definition 287

Delay 120

Delay LCR 149

Delayed mixer 122

Dual pitch 158

Ducker 133

Dyna filter 160

Dyna flange 161

Dynamics 125

Early ref 144

Echo 150

editing 48

Effects 142

EQ 162

Expander 135

Fader 165

Filters 166

Flange 152

Gain trimmer 175

Gate 138

Gate reverb 145

GEQ 164

HPF 166

HQ pitch 157

Input 170

LCR 178

linking parameters 78

- LPF 167
  - Matrix mixer 171
  - Meter 174
  - Misc 175
  - Mod delay 148
  - Mod filter 159
  - Mono delay 146
  - Notch 169
  - Oscillator 176
  - Output 170
  - Pan 179
  - PEQ 162
  - Phaser 154
  - printing lists 87
  - Reverb hall 143
  - Reverb plate 143
  - Reverb room 143
  - Reverb stage 143
  - Reverse gate 145
  - Router 187
  - Stereo compander 125
  - Stereo compressor 128
  - Stereo de-esser 131
  - Stereo delay 147
  - Stereo ducker 133
  - Stereo expander 135
  - Stereo gate 138
  - Surround 2+2 180
  - Surround 3+1 183
  - Surround 5.1 185
  - Switch 189
  - Symphonic 153
  - System mute 177
  - Tremolo 156
  - User control 190
  - User module 193
  - Compressor component 128
  - Configuration windows
    - individual sections 29
    - maximizing 26
    - minimizing 26
    - multiple units 58
    - resizing sections 59
    - restoring 26
  - Configurations
    - assigning to program changes 244
    - closing 60
    - compiling 61
    - definition 287
    - deleting from PC cards 226
    - loading from PC cards 225
    - opening 45
    - opening saved configurations 46
    - printing 87
    - recalling from DME Manager 74
    - recalling from the DME32 198
    - saving 60
    - saving to PC cards 224
    - saving under a new name 60
    - selecting open configurations 46
    - windows 26
    - zooming 50
  - Connecting
    - PC 10
    - power cord 11
    - serial port 10
    - USB port 11
  - Control changes
    - assign table 280
    - assigning to parameters 246
    - settings 242
  - Control size 82
  - Control windows 31
  - Copy command 35
  - Copying
    - components 48
    - user controls 191
  - Crossover components 93
  - Crossover processor components 102
  - Cursor 31
  - Cursor buttons 18
  - Custom components 193
  - Custom control windows 190
  - Customizing component properties 80
  - Cut command 35
- D**
- DA824 D/A converter 256
  - Data transfer command 34
  - DATA wheel 16
  - DEC button 17
  - De-esser component 131
  - Delay components 120
  - Delay LCR component 149
  - Delayed mixer components 122
  - Delete command 35
  - Deleting
    - components 48
    - configurations from PC cards 226
    - DME Manager passwords 85
    - DME32 password 208
    - individual wires 56
    - multiple wires 57
    - parameter link groups 78
    - scenes offline 76
    - user controls 191
    - user modules 196
  - Diagram, printing 87
  - Dimensions 277
  - Display 16
  - DME Manager
    - error messages 271
    - features 6
    - installing 12
    - password protection 83
    - quitting 13
    - reinstalling 12
    - starting 12
    - upgrading 12
    - Windows 13
  - DME32
    - dimensions 277
    - error messages 270
    - features 4
    - front panel 16
    - in a nutshell 2
    - initializing 210
    - rear panel 19
    - turning on and off 11
  - Dragging
    - components from the component list 47
    - rotary controls 32
    - sliders 32
  - DSP power meter 27
  - DSP, definition 287
  - Dual pitch component 158
  - Ducker component 133
  - Duplicate command 35
  - Duplicating components 48
  - Dyna filter component 160
  - Dyna flange component 161
  - Dynamics components 125
- E**
- Early ref component 144
  - Echo component 150
  - Echo settings, MIDI 242
  - Edit menu 35
  - Edit mode
    - about 22
    - definition 287
    - selecting 45
  - Editing
    - component parameters from DME Manager 69

- component parameters from the
    - DME32 201
  - components 48
  - configurations 44
  - parameter link groups 78
  - scenes offline 76
  - Effect components 142
  - Ejecting PC cards 222
  - EMERGENCY indicator 17
  - Emergency mode
    - assigning 214
    - definition 287
    - using 220
  - EQ components 162
  - Error messages
    - DME Manager 271
    - DME32 270
  - Euro-block connectors 20
  - Execute command 62
  - Exit command 34
  - Exiting DME Manager 13
  - Expander component 135
  - External wordclock
    - DME Manager setting 229
    - DME32 setting 209
- F**
- Factory defaults, initializing 210
  - Fader components 165
  - Features
    - DME Manager 6
    - DME32 4
  - File menu 34
  - Filter components 166
  - Firmware
    - definition 287
    - version 210
  - Flange component 152
  - Forgotten passwords
    - DME Manager 85
    - DME32 203
  - Formatting PC cards 223
  - Front panel 16
  - FS, definition 287
  - Full protect mode 205
- G**
- Gain trimmer component 175
  - Gate component 138
  - Gate reverb component 145
  - General purpose interface 212
  - GEQ components 164
  - Getting started 9
  - GND, GPI terminal 212
  - GPI
    - about 212
    - assigning inputs 214
    - assigning outputs 217
    - connectors 212
    - definition 287
    - multiple DME32s 236
  - GPI command 36
  - Grid
    - about 28
    - aligning components 49
  - Grid command 36
  - Groups, parameter linking 78
- H**
- Height, component setting 80
  - Help menu 38
  - Home page on the web iii
  - Hookup examples
    - AD824 & DA824 257
    - multiple DME32s 238
    - wordclock termination 234
    - wordclocks 231
  - HPF component 166
  - HQ pitch component 157
- I**
- I/O cards
    - about 252
    - checking 210
    - choosing 253
    - installing 255
    - specifications 253
    - wordclock source 229
  - I-beam cursor 33
  - IN, GPI terminal 212
  - INC button 17
  - Initial settings, definition 287
  - Initializing the DME32 210
  - Input component 170
  - Inserting PC cards 222
  - Installing
    - DME Manager 12
    - DME32 7
    - I/O cards 255
    - USB driver 14
  - Interface
    - alt menu 41
    - buttons 32
    - cursor 31
    - menus 34
    - pop-up menus 33
  - rotary controls 32
  - sliders 32
  - text fields 33
  - tool palette 41
  - windows 33
- Internal wordclock**
- DME Manager setting 229
  - DME32 setting 209
- Internet web site iii**
- K**
- Keyboard shortcuts 42
- L**
- LCD Disp, setting 86
  - LCR component 178
  - Linking component parameters 78
  - Loading
    - configurations from PC cards 225
    - MIDI settings 249
    - user modules 195
  - LOCK indicator 17
  - LPF component 167
- M**
- Main window 23
  - Mains lead 11
  - Matrix mixer components 171
  - Maximizing configuration windows 26
  - Menus
    - alt 41
    - component 37
    - edit 35
    - file 34
    - help 38
    - mode 35
    - shortcut 39
    - tool 36
    - view 36
    - window 38
  - Meter components 174
  - MIDI
    - about 242
    - assigning configurations 244
    - assigning parameters 246
    - assigning scenes 244
    - control change assign table 280
    - data format 283
    - definition 288
    - deleting settings 250

- implementation chart 295
- IN port 242
- loading settings 250
- multiple DME32s 236
- omni settings 242
- OUT port 242
- parameter changes 248
- program change assign table 279
- saving settings 249
- settings 242
- MIDI command 36
- mini YGDAI
  - card specifications 253
  - cards 252
  - definition 288
- Minimizing configuration windows 26
- Misc components 175
- Mod delay component 148
- Mod filter component 159
- Mode menu 35
- Modes 22
- Module command 35
- Mono delay component 146
- Multiple DME32s
  - about 236
  - cascade connections 237
  - configuration window sections 29
  - configuration windows 58
  - hookup examples 238
  - notes 236
  - resizing configuration window sections 59
- MY cards 252
- N**
- New command 34
- Nodes
  - about 30
  - user module setting 80
- Notch component 169
- O**
- Off password 83
- Offline edit command 34
- Offline scene editing 76
- Omni settings, MIDI 242
- Open command 34
- Opening
  - new configuration windows 45
  - saved configurations 46
- Oscillator component 176
- OUT, GPI terminal 212
- Output component 170
- Oversampling, definition 288
- Owner's manual, about 7
- P**
- Pairing component parameters 78
- Pan component 179
- Pan components 178
- PARAMETER button and indicator 17
- Parameter changes
  - settings 242
  - using 248
- Parameter link command 37
- Parameters
  - assigning to control changes 246
  - editing from DME Manager 69
  - editing from the DME32 201
  - printing lists 87
- Passwords
  - changing on DME Manager 84
  - changing on the DME32 207
  - deleting on DME Manager 85
  - deleting on DME32 208
  - forgotten DME Manager 85
  - forgotten DME32 203
  - setting on DME Manager 84
  - setting on the DME32 203
  - temporarily disabling on the DME32 206
- Paste command 35
- Pasting
  - components 48
  - user controls 191
- PC
  - connecting 10
  - system requirements 12
- PC cards
  - about 222
  - definition 288
  - deleting configurations 226
  - ejecting 222
  - formatting 223
  - inserting 222
  - loading configurations 225
  - multiple DME32s 236
  - saving configurations 224
- PC CONTROL port
  - about 19
  - connecting 10
  - pin assignments 274
- PC CONTROL switch 19
- PCMCIA
  - cards 222
  - definition 288
- PEQ components 162
- Phaser component 154
- Pin assignments
  - CASCADE IN 276
  - CASCADE OUT 275
  - PC CONTROL port 274
- Pointing finger 31
- Pop-up menus 33
- Power cord 11
- POWER switch
  - about 18
  - using 11
- Powering up the DME32 11
- Previewing
  - printer output 87
  - scenes offline 76
- Print command 34
- Printer setup command 34
- Printing 87
- Program changes
  - assign table 279
  - assigning to configurations 244
  - assigning to scenes 244
  - settings 242
- Properties command 35
- Properties, components 80
- PROTECT button and indicator 17
- Protect, component setting 80
- Protecting
  - DME Manager configurations 83
  - DME32 operation 203
- Protection command 36
- Q**
- Quitting DME Manager 13
- R**
- Rear panel 19
- RECALL button
  - about 17
  - using 200
- Recalling
  - configurations from DME Manager 74
  - configurations from the DME32 198
  - scenes from DME Manager 72
  - scenes from the DME32 200
  - scenes offline 76

- Receive channel, MIDI 242
  - Receiving configurations from the DME32 63
  - Reinstalling DME Manager 12
  - Removing
    - components 48
    - parameters from link groups 78
    - wires 56
  - Resizing configuration window sections 59
  - Restoring configuration windows 26
  - Restricting access to the DME32 203
  - Reverb hall component 143
  - Reverb plate component 143
  - Reverb room component 143
  - Reverb stage component 143
  - Reverse gate component 145
  - Rotary controls 32
  - Rotary controls, size setting 82
  - Router components 187
  - RS232C
    - connecting 10
    - definition 288
    - switch 19
  - RS422
    - connecting 10
    - definition 288
    - switch 19
  - Run mode
    - about 22
    - definition 288
    - selecting 66
  - Run mode controller
    - about 33
    - recalling configurations 74
    - recalling scenes 72
    - storing scenes 70
    - using 67
  - Rx channel, MIDI 242
- S**
- Sampling rate, definition 288
  - Save as command 34
  - Save command 34
  - Saving
    - configurations 60
    - configurations to PC cards 224
    - configurations under a new name 60
    - MIDI settings 249
    - user modules 194
  - Scene edit dots
    - about 16
    - recalling scenes 200
    - storing scenes 199
  - Scene list
    - recalling scenes 73
    - storing scenes 71
  - SCENE NO indicator
    - about 16
    - recalling scenes 200
    - storing scenes 199
  - SCENE RECALL number keypad
    - about 17
    - using 200
  - Scene recall only mode 204
  - Scenes
    - assigning to program changes 244
    - definition 288
    - editing offline 76
    - multiple DME32s 236
    - recalling from DME Manager 72
    - recalling from the DME32 200
    - scene edit dots 16
    - SCENE NO indicator 16
    - storing from DME Manager 70
    - storing from the DME32 199
  - Selecting
    - cable mode 51
    - edit mode 45
    - open configuration windows 46
    - run mode 66
    - wordclock source from DME Manager 229
    - wordclock source from the DME32 209
  - Sending configurations to the DME32 62
  - Serial port 10
  - Shortcut menu 39
  - Shortcuts, keyboard 42
  - Show grid option 49
  - Sliders 32
  - Sliders, size setting 82
  - Slots
    - card options 252
    - card specifications 253
    - choosing cards 253
    - installing I/O cards 255
  - Snap to grid option 49
  - Spacing, grid setting 49
  - Specifications
    - control I/O 274
    - general 273
    - I/O cards 253
    - MIDI data format 283
  - Starting DME Manager 12
  - Status bar 25
  - Stereo compander component 125
  - Stereo compressor component 128
  - Stereo de-esser component 131
  - Stereo delay component 147
  - Stereo ducker component 133
  - Stereo expander component 135
  - Stereo gate component 138
  - STORE button
    - about 17
    - using 199
  - Storing
    - scenes from DME Manager 70
    - scenes from the DME32 199
    - scenes offline 76
  - Surround 2+2 component 180
  - Surround 3+1 component 183
  - Surround 5.1 component 185
  - Switch components 189
  - Switching on the DME32 11
  - Symphonic component 153
  - System mute component 177
  - System requirements 12
- T**
- Tascam TDIF-1 format
    - definition 288
    - I/O cards 252
  - Terminal usage 214
  - Terminating wordclocks 234
  - Text fields 33
  - Threshold value 217
  - Title bar 23
  - Titling
    - components 80
    - scenes offline 76
  - Tool bar 24
  - Tool menu 36
  - Tool palette 41
  - Tool palette command 36
  - Transferring
    - configurations from the DME32 63
    - configurations to the DME32 62
  - Transmit channel, MIDI 242
  - Tremolo component 156
  - Triggering the GPI 212
  - Troubleshooting 261
  - Turning on the DME32 11
  - Tx channel, MIDI 242

## U

- Undo command 35
- Upgrading DME Manager 12
- USB
  - checking the driver 14
  - connecting 11
  - definition 288
  - driver installation 14
  - operating notes 14
  - port 17
- USB driver 14
- User controls
  - copying controls 191
  - deleting 191
  - pasting 191
  - using 190
- USER DEFINE button
  - about 18
  - assigning 86
  - using 201
- User define button command 36
- User modules
  - deleting 196
  - loading 195
  - properties 80
  - saving 194
  - using 193
  - wiring 193
- UTILITY button and indicator 18

## V

- VALUE button and indicator 18
- Version
  - DME Manager 38
  - DME32 firmware 210
- View menu 36

## W

- Web site iii
- Width, component setting 80
- Window menu 38
- Windows 13
- Wires
  - adding individual 51
  - adding multiple 53
  - deleting individual 56
  - deleting multiple 57
- Wiring
  - components 51
  - user modules 193
- WORD CLOCK 75Ω ON/OFF
  - switch 19

- Word clock command 36
- WORD CLOCK IN
  - about 19
  - terminating 234
  - using 229
- WORD CLOCK OUT
  - about 19
  - using 229
- Wordclocks
  - about 228
  - connections 229
  - definition 288
  - hookup examples 231
  - multiple DME32s 236
  - selecting from DME Manager 229
  - selecting from the DME32 209
  - terminating 234

## X

- X, grid spacing 49

## Y

- Y, grid spacing 49
- Yamaha web site iii
- YGDAI
  - card specifications 253
  - cards 252
  - definition 288

## Z

- Zoom
  - about 28
  - using 50
- Zoom command 36

MIDI Implementation Chart

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Changed	1-16 1-16	1-16 1-16	Memorized
Mode	Default Messages Altered	X X *****	OMNI OFF/OMNI ON X X	Memorized
Note Number	True Voice	X *****	X X	
Velocity	Note On Note Off	X X	X X	
After Touch	Keys Ch's	X X	X X	
Pitch bend		X	X	
Control Change	0-119	0	0	Assignable
Prog Change	:True#	0-127 *****	0-127 X	Assignable
System Exclusive		0	0	Parameter Change
System Common	:Song Pos :Song Sel :Tune	X X X	X X X	
System Real Time	:Clock :Commands	X X	X X	
Aux Messages	:Local ON/OFF :All Notes OFF :Active Sense :Reset	X X X X	X X X X	
Notes				

Mode 1: OMNI ON, POLY  
Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO  
Mode 4: OMNI OFF, MONO

O: Yes  
X: No



YAMAHA CORPORATION  
Pro Audio & Digital Musical Instrument Division  
P.O. Box 3, Hamamatsu, 430-8651, Japan