MUTE16

16 Channel Rackmount Audio Mute System

Installation Guide & User Instructions

Table of Contents

M16-DOC-002-A

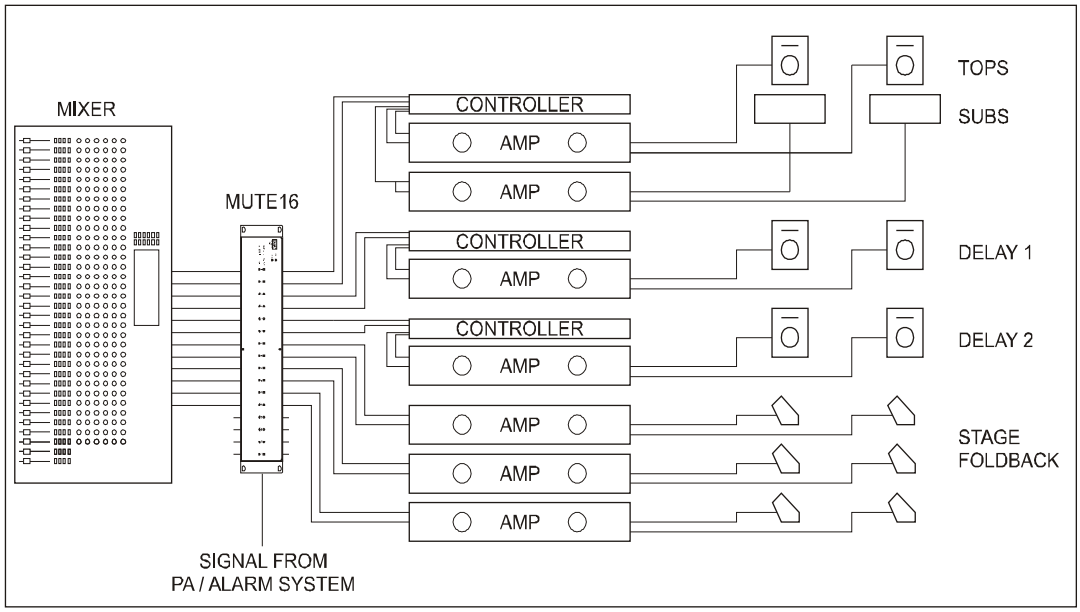
Introduction

Thank you for purchasing the Mute16. This guide will take you through some important information that should be considered when installing and using your new device. Please take the time to read this booklet carefully to ensure years of trouble-free operation.

The Mute16 is a 16 channel audio mute device that can help meet the current safety guidelines at large events. Originally designed for use on a ship, the device heavily attenuates the sound level of a sound reinforcement system at entertainment venues upon activation from the emergency circuit of the ships main PA system. The result is that in the event of an emergency, important announcements can be clearly heard. This concept is applicable to anywhere that announcements from a building or site PA system must be heard over a high power sound reinforcement system at an entertainment venue, such as concert halls, theatres, festival sites, etc.

In an increasingly regulated society, it is the responsibility of employers and the organisers of events to ensure the safety of employees and members of the public. There are many regulations and guidelines that mention the intelligibility of announcements, one of the more notable is from the "Event Safety Guide" as published by the Health and Safety Executive in the UK, which mentions "*In the event of a major incident, override facilities must allow announcements to be made over the PA system without interference from other sound sources*" (para. 262). If the "other sound source" is an entertainment venue, then a means of providing a mute facility that can mute all the power amplifiers in use at that venue could be of great benefit.

The Mute16 gives system designers the ability to design-in global muting facilities to new installations, or to add the facility to existing systems. The unit is installed between the mixer and the power amplifiers using standard balanced, line level XLR connections. The figure below shows a typical installation scenario.



The Mute16 uses voltage controlled amplifiers to shape the amplitude of the signal in order to avoid switching clicks, and to provide a gradual return ramp of the signal when the mute is lifted. The control signal is a simple switch contact that is optically isolated within the Mute16.

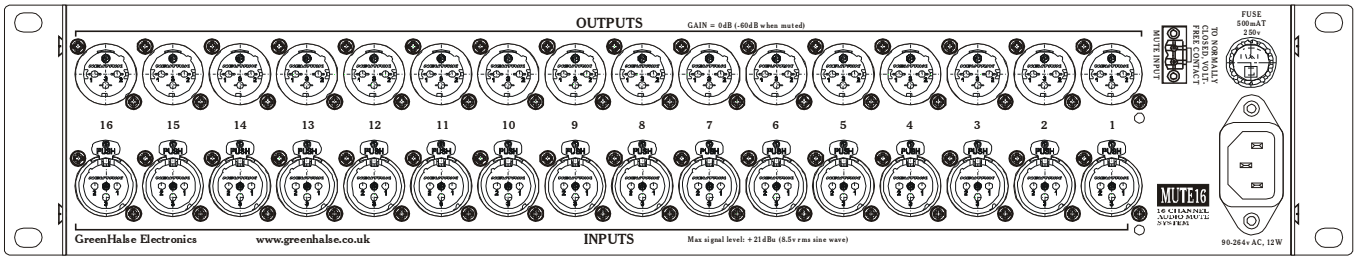
Please note that this system is NOT suitable for use where the sound system being controlled is the only means of making emergency announcements – it is intended to mute a secondary entertainment system where another primary system exists to make important announcements.

Another possible use for the Mute16 is to control sound pressure level. Many buildings have SPL monitoring devices installed that brutally cut the power to entertainment systems in the event of excessive sound level. By linking such a monitoring system to a Mute16, a more equipment friendly solution can be installed.

Installation

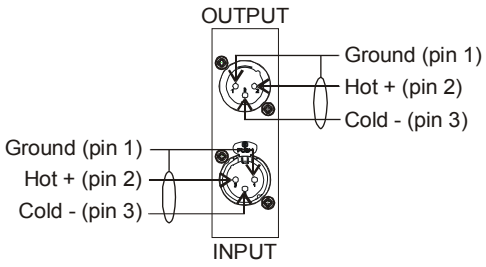
Siting

The Mute16 is intended for indoor use only. If used outdoors, please ensure adequate protection. The unit is designed to be mounted in a standard 19" rack, and would typically be mounted adjacent to the amplifiers. The unit takes 2U of rack space.



Audio Connections

Standard 3-pin XLR connectors are used for the audio input and output connections, using the convention that the input is accepted on a female connector and the output is presented on a male connector. The inputs are AC coupled (any DC offset, such as phantom power, is blocked at the input). Line level signals should be used (+21dBu max). The gain of the unit is nominally 0dB, which reduces to -60dB when muted. The figure apposite shows the audio connections.



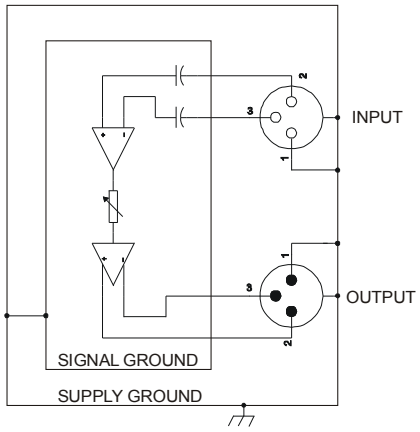
If using the unit with unbalanced signals (not recommended), then connect the input between Hot+ (pin 2) and ground (pin 3), and connect the Cold- (pin 3) input to ground. Take the output from Hot+ and ground, and leave Cold- (pin 3) unconnected. Note that when using unbalanced input connections the gain is reduced to -6dB.

Grounding

Grounding (or earthing) is a controversial subject in the audio world. The subject is too deep to go into here, but this device is designed according to the following principles.

The case of the Mute16 is connected to the mains earth via the mains input socket. The input and output XLR connectors connect both pin 1 and the connector shell directly to case.

The input and output connector grounds are not connected directly to the internal signal ground. The internal signal ground is kept isolated, except for a single point where it is connected to the power earth (and the case) via a zero ohm link.



Power Supply

The Mute16 is designed to operate from an AC supply from 90 to 264v, which means it can be used in most parts of the world. The supply should be connected using a standard IEC mains cable. The fuse on the rear panel is connected in line with the live mains connection, and should be replaced, if necessary, with a 20mm 500mA Time delay fuse.

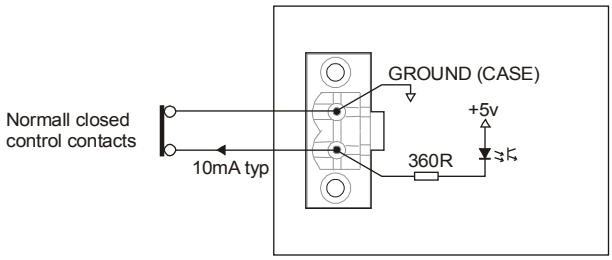
There is a second fuse on the power supply board, and that is connected in line with the neutral mains connection. This means that the unit is double fused, and is suitable for use with delta-connected mains systems. This second fuse can only be replaced by qualified service personnel.

Control Input

The unit should controlled using a simple normally closed contact, connected between the two input terminals.

One of the terminals is ground, and the other connects to the LED of an opto-isolator, as shown in the schematic opposite.

When the control circuit is closed, the audio gain is 0dB. When the control circuit is open, the audio gain is -60dB.



Ventilation

The Mute16 consumes very little power and requires no special ventilation other than what is normally available to rack mounted equipment.

Operation

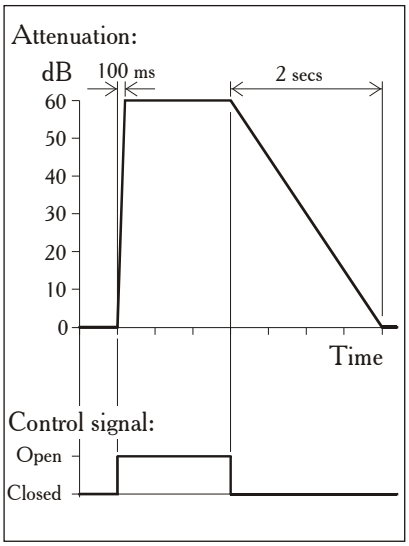
Gain

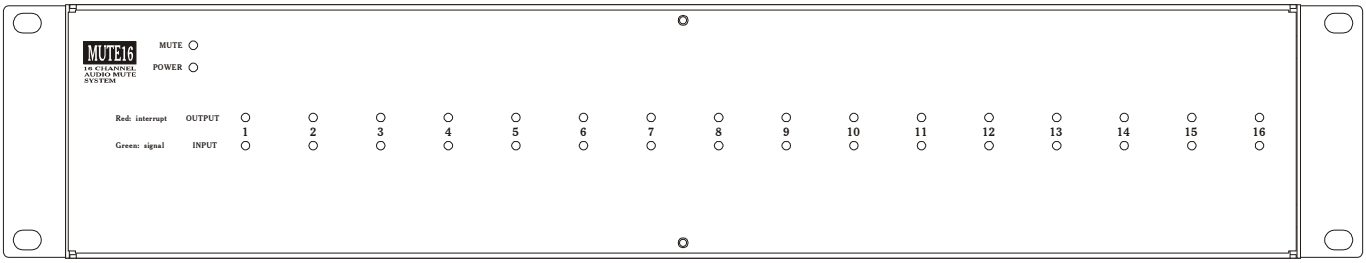
Normally, the control contact is closed and the mute16 will pass line level audio signals through the unit with no significant change in level.

When the control circuit is broken, the gain of all 16 channels very quickly drops to -60dB (in about 100ms). The gain stays at this level for as long as the control circuit remains broken.

When the control circuit is re-established, the gain will gently rise back to zero dB over a period of approximately 2 seconds. This period is fixed at the factory (other timing can be made available to special order).

The chart opposite shows the control timing.





Indicators

The Mute16 front panel has indicators for the following functions:

Mute:	Red	Illuminates when the control circuit is broken.
Power:	Green	Illuminates when the power is supplied.

On each channel:

Output:	Red/Green	Red when the channel is muted. Green when a signal is present.
Input:	Green	Illuminates when a signal is present.

Specifications

Supply:

Voltage:	90 to 264 V AC, 47-63 Hz
Current:	<100mA
Fuse:	Replaceable 500mAT 200mm in Live, non-replaceable in Neutral.

Audio:

Max level:	+21dBu, balanced.
Gain:	0dB ±1dB when not muted, -60dB ±6dB when muted
Input impedance:	>10k Ohms
Frequency response:	20Hz to 25KHz, ±1dB
Distortion:	0.02% THD

Control Signal:

Current when closed:	10mA nominal
Open circuit voltage:	5 V maximum
Reverse voltage:	11 V maximum

Case:

Dimensions:	Width:	484mm to extremes of rack ears (19" rack)
	Height:	89mm (2U rack space)
	Depth:	65mm max, not including connectors
Weight:	TBD kg.	

Environmental:

Operating temp:	0 to 55 ºC
Storage temp:	-10 to +70 ºC
Humidity:	10 to 90%, non condensing