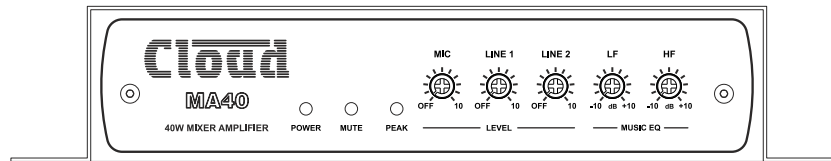
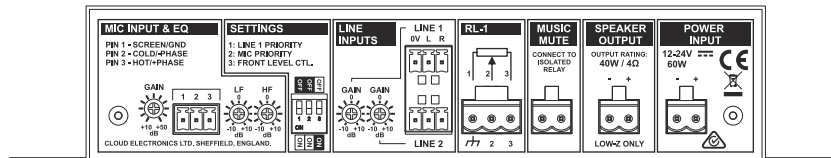


# MA40 Mini Amplifier



MA40 Front Panel



MA40 Rear Panel

## General Description

The MA40 is a very compact mono amplifier designed for integration into installed audio and AV systems where de-centralisation of system components is advantageous. It is intended as an “install-and-forget” component, and is small enough to be fitted into a wall or ceiling void, or in any convenient location adjacent to a projector, flat screen display or loudspeakers, for example. A simple set of controls and configuration options makes it easy to integrate into any audio system. It is highly suitable for use with in-store digital signage, gallery and museum exhibits and fixed or mobile tour guide systems.

The MA40 can drive 40 W into a 4 ohm load when used with the external 24V mains PSU supplied with the amplifier, but it will operate from any external DC supply of between 12 and 24V, making it ideal for installation on buses, trams, river boats, or anywhere an AC mains supply may not be readily available. The maximum output power is reduced with supply voltages below 18V.

The power amplifier stage is fully protected against DC offset, over-current, over- and under-voltage and is also thermally protected. A switch-on delay function mutes the output during power-up and power-down to protect loudspeakers.

The amplifier mixes two unbalanced stereo line inputs with a balanced microphone input; the stereo inputs are summed to mono internally (the music channel). LINE 1 can be set to have priority over LINE 2 via a rear panel DIP switch to allow the connection of message stores, etc. The mic input can be configured (by another DIP switch) to automatically take priority over the line inputs when a mic signal is present, allowing its use for announcements. 12V phantom power is available at the mic input, selectable by internal jumper.

Front panel controls are provided for MIC, LINE 1 and LINE 2 levels; additionally there are LF and HF EQ controls for the music channel which allow the amplifier’s response to be optimised to suit the loudspeakers and acoustic environment. A PEAK LED illuminates if the amplifier’s dynamic clip protection becomes active, and thus clearly indicates the onset of distortion.

On the rear panel, each line input has a preset control for gain, while the mic input has both preset gain and LF and HF EQ controls. A dedicated remote level control port is provided to permit the output level to be controlled by a standard Cloud RL Series remote control plate.

In common with most Cloud products, a Music Mute Input is provided, which may permit compliance with local Fire Authority regulations; the microphone input remains active when the Music Mute is applied. A front panel MUTE LED illuminates if the Music Mute function becomes active.

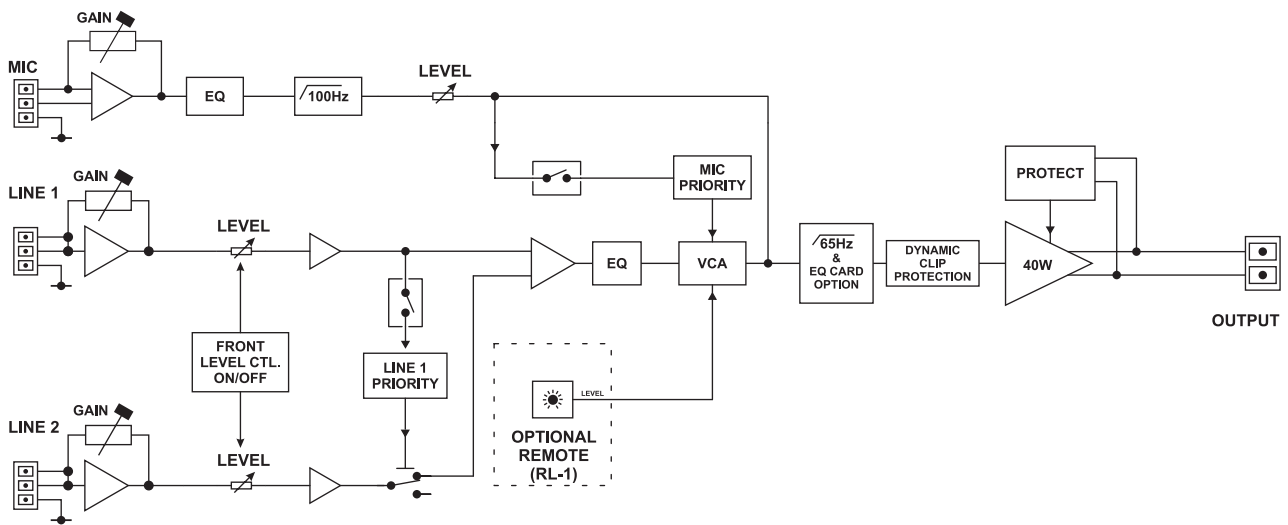
The MA40 is very energy-efficient\* and draws very little power in a quiescent state. A user-selectable automatic power-down function puts the amplifier into an ultra-low-current standby mode after a preset period with no signal. A bicolour front panel LED indicates standby and active statuses.

\*ENERGY STAR certification applied for.

## Key features

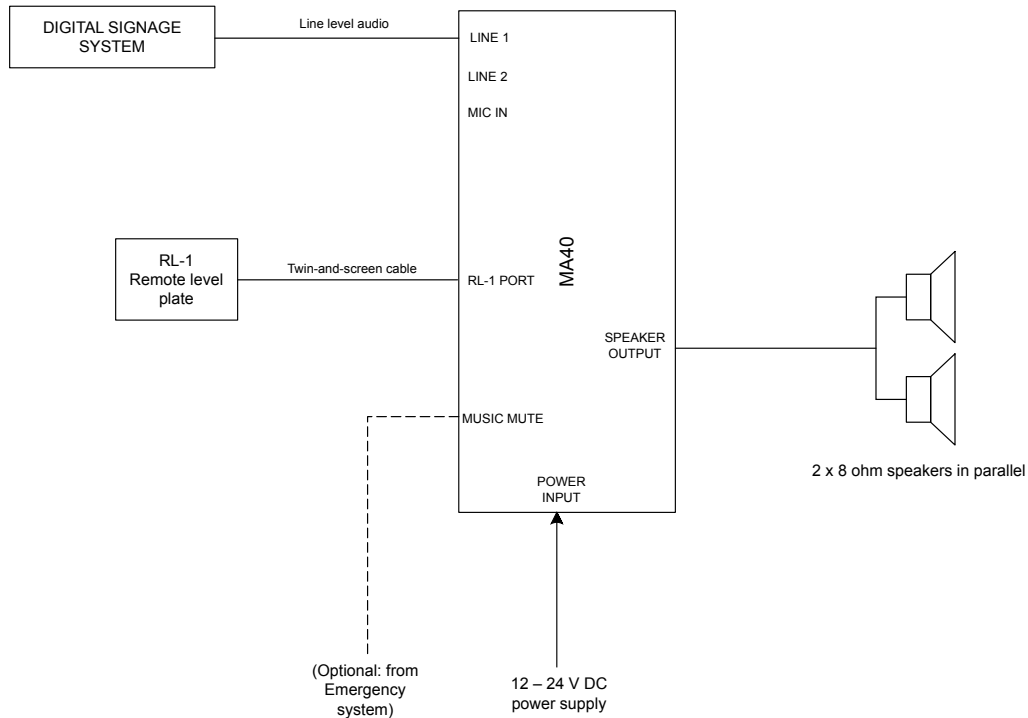
- Compact mono amplifier module for “install-and-forget” situations
- Two (unbalanced) stereo line inputs with individual sensitivity trims
- Electronically-balanced mic input with separate gain control
- Phantom power selectable by internal jumper
- Front panel control of music level and mic levels
- Front panel HF & LF EQ adjustments for music sources
- Rear panel HF & LF EQ adjustment for mic input
- Selectable MIC-over-LINE priority
- Selectable LINE 1-over-LINE 2 priority
- 40 W power amplifier
- Optional EQ cards available to suit various popular installation loudspeakers
- Remote level control port; compatible with Cloud RL Series plates
- Music Mute input; selectable N/O or N/C
- Automatic power-down function (user-selectable)
- Less than 1 W power consumption in sleep mode
- Convection cooled – silent in operation.
- PSU meets US DoE Level VI energy requirements
- Power requirements: 12 to 24V DC, 47 W
- Universal AC adaptor included, operates from 100 to 240V AC

## Block Diagram



## System Example

### Adding audio to digital signage with an MA40



Video displays used in digital signage systems do not normally incorporate loudspeakers, and if they do, audio quality is frequently poor due to size constraints. The system shown here uses an MA40 to improve the audio in a digital signage system. The compact size of the MA40 makes it practical to attach it by some simple means to the rear of the displays themselves.

The audio feed from the signage system is connected to one of the line inputs. An RL-1 remote level control plate could be installed in a location convenient to staff to permit easy adjustment of volume.

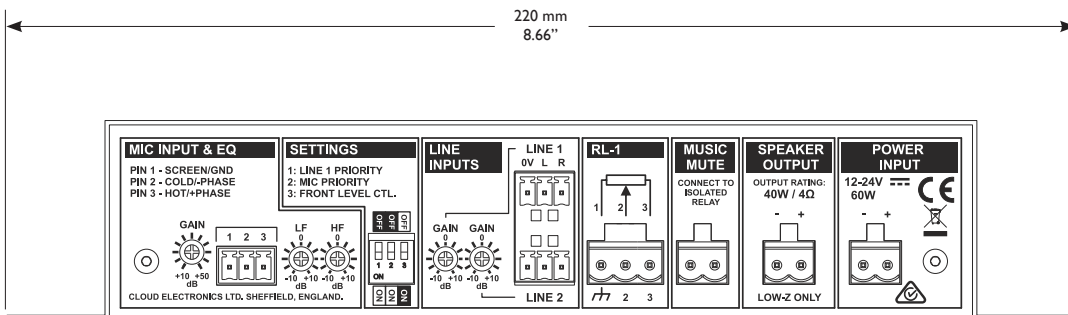
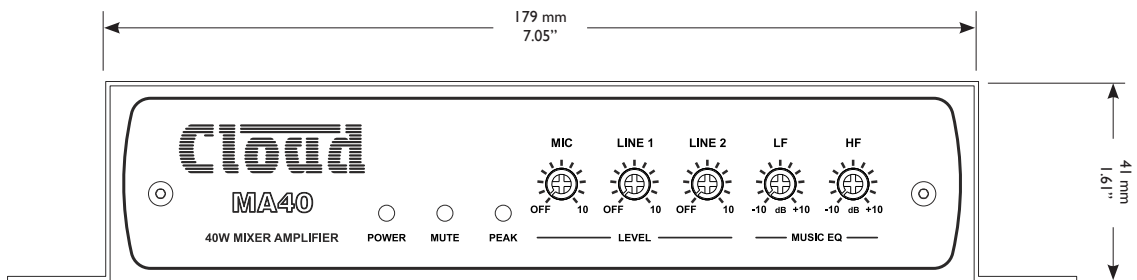
This is an example of a “install-and-forget” system; at the end of each day the MA40 would automatically enter its ultra-low power state once the video/audio feed is stopped.

Two loudspeakers are shown, connected in parallel.

## Technical Specifications

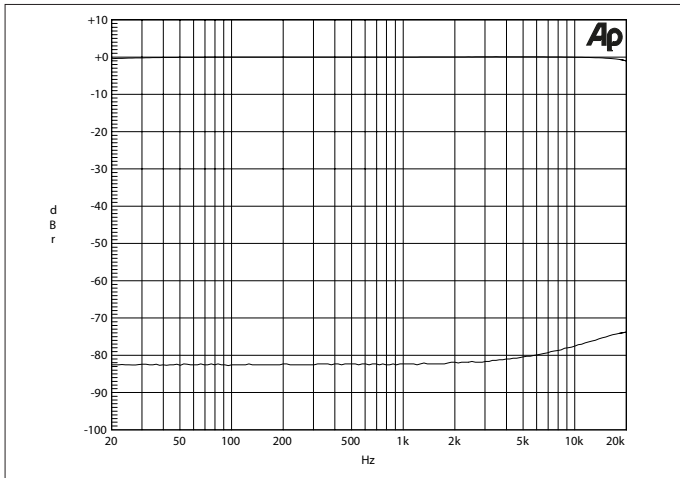
Line inputs			
Frequency Response	±1 dB, 20 Hz to 20 kHz		
Distortion	<0.1 %		
Sensitivity	-12 dBu to +8 dBu		
Input Gain Control	20 dB range		
Input Impedance	10 kohms (unbalanced)		
Headroom	>12 dB		
Noise	<-90 dB		
Equalisation	LF: ±10 dB @ 50 Hz, HF: ±10 dB @ 10 kHz		
Microphone input			
Frequency Response	-3dB @ 120 Hz (filter) to 20 kHz ±1 dB		
Distortion	<0.1%		
Gain	10 dB to 50 dB		
Input Impedance	>2 kohms (balanced)		
Headroom	>12 dB		
Noise	<-90 dB		
Phantom Power	+12V (internal jumper)		
Output			
Output Power (1 kHz continuous sine wave)	40 W, DC input >18V		
General			
Power Input	12V to 24V DC. (External 24V AC adaptor supplied.)		
Power consumption	47 W		
External AC PSU adaptor	Universal type, 100V to 240V, 47 to 63 Hz		
Amplifier protection	Fixed level signal limiter. Protection against DC, PSU overcurrent, amplifier overcurrent, over-temperature, supply voltage under/over-voltage, Resettable internal breaker (no fuses)		
Dimensions (w x h x d)	MA40	Net	220 mm x 41 mm x 144.5 mm, 8.7" x 1.6" x 5.7"
		Shipping	290 mm x 160 mm x 210 mm, 11.4" x 6.3" x 8.3"
Weight	MA40	Net	750 g
		Shipping	1.0 kg

Dimensions: MA40

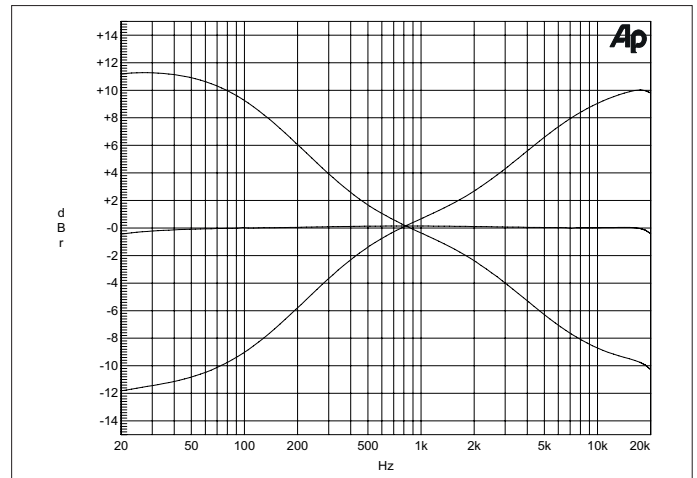


## Performance Graphs

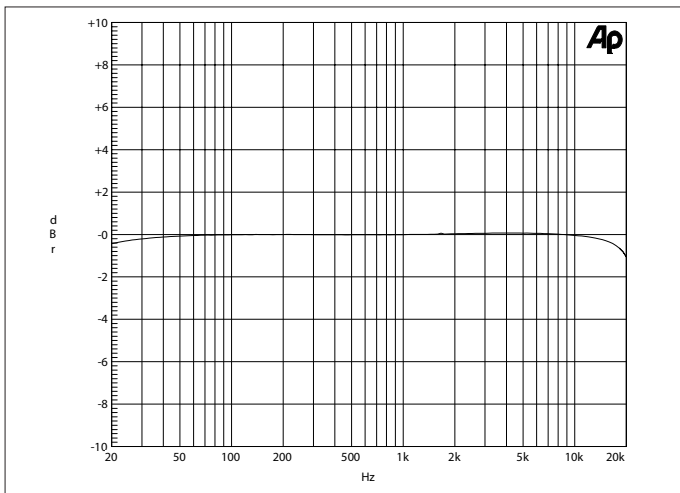
Line Attenuation



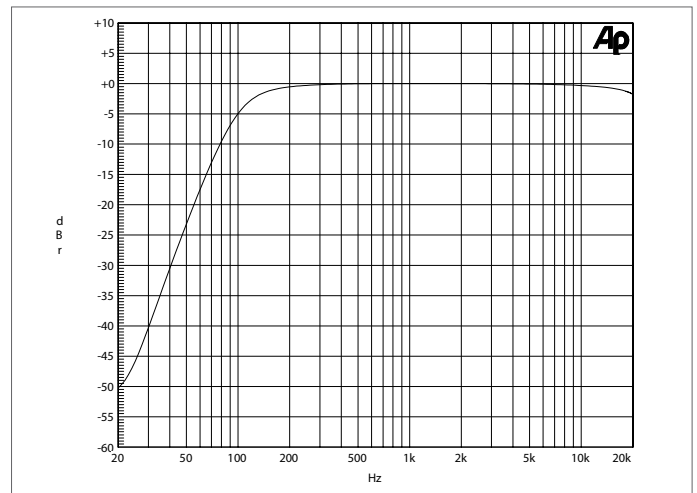
Line EQ



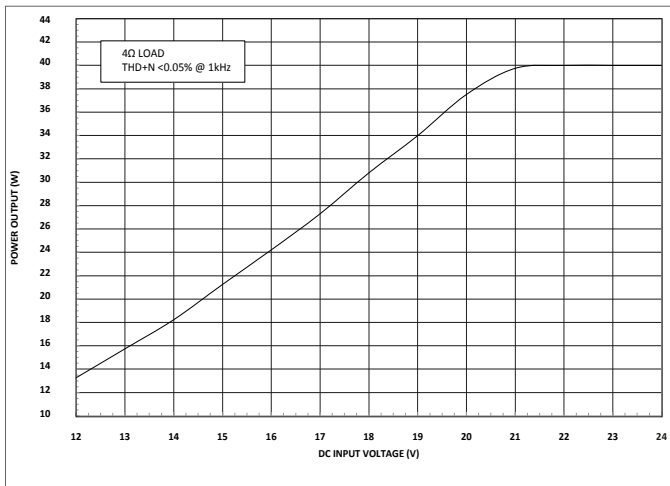
Line Frequency Response (8 ohms)



Microphone Frequency Response



Power vs Supply Voltage



## Architect's and Engineer's Specification

The single channel amplifier shall have a low-impedance output able to deliver 40 W into a 4 ohm load. The output shall be via a plug-in screw terminal connector.

The amplifier shall be equipped with two unbalanced stereo line inputs and an electronically balanced microphone input; the line inputs shall be summed internally to mono (the music channel), and mixed with the microphone input. The front panel shall be fitted with a microphone level control, separate level controls for each line input and HF and LF equalisation controls for the music channel. Each of the three inputs shall have rear panel sensitivity controls; the microphone input shall have in addition HF and LF equalisation controls: all rear panel rotary controls shall be of the preset type. Phantom power shall be available at the microphone input, selectable by an internal jumper. All input connections shall be via plug-in screw terminal connectors. There shall be visual indication on the front panel if any input signal activates the amplifier's clip protection.

It shall be possible to configure the mixer to perform the following functions: i) detection of a signal on the microphone input will automatically mute the music signal, ii) detection of a signal on one line input will automatically override the other. It shall be possible to select these configurations without removing any part of the amplifier housing.

A control input shall be provided to permit the audio output level of the amplifier to be adjusted from a remote location; an optional accessory shall be available to facilitate this. The input connector shall be of the plug-in screw-terminal type.

An external control input shall be provided on a plug-in screw terminal connector to allow muting of the music channel by a fire alarm or other external emergency system via isolated, 'voltage-free' contacts, and this input shall be configurable to respond to either a short or open external circuit. There shall be visual indication of the mute input's state on the front panel.

The amplifier shall be compliant with the relevant provisions of EnergyStar® Eligibility Criteria Ver. 3.0 for Audio-Video Products. In the absence of an input signal, it shall automatically enter "standby" mode wherein the DC power consumption shall be less than 1 W. It shall be possible to override this mode by an internal jumper.

The amplifier shall be built in a robust steel housing suitable for installation in unattended locations. Cooling shall be by natural convection. The amplifier shall be supplied with an external 24 V DC power supply capable of operating on any AC mains supply voltage from 100 V to 240 V. The maximum output power of 40 W shall be available when the amplifier is operated from a supply of 18 V or higher. The power input connector shall be of the plug-in screw terminal type. There shall be colour-coded visual indication of the amplifier's power status (i.e., active or standby modes) on the front panel.

The amplifier shall be the Cloud MA40. The optional remote control plate shall be the Cloud RL-I Series.