M4

Manual (1.2EN)

d&b audiotechnik

References in the manual



WARNING! — **This refers to a potentially dangerous situation which may lead to personal injury.**

CAUTION! — **This refers to a potentially dangerous situation which may lead to personal injury.**

IMPORTANT! — **This refers to a situation which may cause the equipment to malfunction.**

Note: — **Additional informations and/or references**

Symbols on the equipment



Please refer to the information in the operating manual.



WARNING!
Dangerous voltage!

General Information

M4 Manual

Version 1.2EN, 05/2006, D2990.EN .01

© by d&b audiotechnik AG 2006; all rights reserved.

The information contained in this manual has been carefully checked for accuracy, at the time of going to press, however no guarantee is given with respect to the correctness.

d&b audiotechnik AG accepts no responsibility for any errors or inaccuracies that may appear in this manual or the products and software described in it.

Technical specifications, dimensions, weights and properties do not represent guaranteed qualities.

As manufacturers we reserve the right to make alterations and modifications within the framework of legal provisions, as well as changes aimed at improving quality.

d&b audiotechnik AG
Eugen-Adolff-Strasse 134, D-71522 Backnang, Germany
Telephone +49-7191-9669-0, Fax +49-7191-95 00 00
E-mail: docadmin@dbaudio.com, Internet: www.dbaudio.com

Safety precautions

Before you use our products, read the manual carefully and observe all the safety precautions. They will protect you and help to avoid equipment failures.

Keep this manual in a safe place so that it is available for future reference.

If you supply d&b products, please draw the attention of your customers to these safety guidelines. Enclose the relevant manuals with the systems. If you require additional manuals for this purpose, you can order them from d&b.

Information regarding use of loudspeakers



WARNING!

Never stand in the immediate vicinity of loudspeakers driven at a high level. Professional loudspeaker systems are capable of causing a sound pressure level detrimental to human health. Seemingly non-critical sound levels (from approx. 95 dB SPL) can cause hearing damage if people are exposed to it over a long period.

In order to prevent accidents when deploying loudspeakers on the ground or when flown, please take note of the following:

When setting up the loudspeakers or loudspeaker stands, make sure they are standing on a firm surface. If you place several systems on top of one another, use straps to secure them against movement.

Only use accessories which have been tested and approved by d&b for assembly and mobile deployment. Pay attention to the correct application and maximum load capacity of the accessories as detailed in our specific "Mounting instructions" or in our "Flying system and Rigging manuals".

Ensure that all additional hardware, fixings and fasteners used for installation or mobile deployment are of an appropriate size and load safety factor. Pay attention to the manufacturers instructions and to the relevant safety guidelines.

Regularly check the loudspeaker housings and accessories for visible signs of wear and tear, and replace them when necessary.

Regularly check all load bearing bolts in the mounting devices.

CAUTION!

Loudspeakers produce a static magnetic field even if they are not connected or are not in use. Therefore make sure when erecting and transporting loudspeakers that they are nowhere near equipment and objects which may be impaired or damaged by an external magnetic field. Generally speaking, a distance of 0.5 m (1.5 ft) from magnetic data carriers (floppy disks, audio and video tapes, bank cards, etc.) is sufficient; a distance of more than 1 m (3 ft) may be necessary with computer and video monitors.

M4

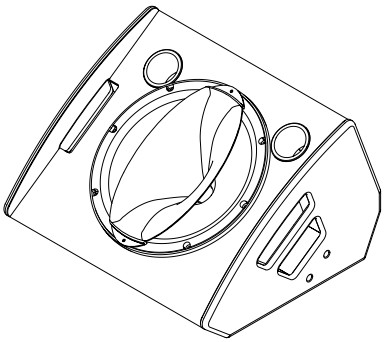


Fig. 1: M4 loudspeaker

The M4 is a high performance stage monitor employing an integrated 15"/1.3" exit coaxial driver design with neodymium magnet and constant directivity horn loading. Its dispersion of 50° x 70° (hor. x ver.) provides an accurately defined coverage area on stage. Used upright the M4 serves as a powerful front PA speaker (70° x 50°) for various applications.

The M4 is a two way design with a built in passive crossover network. It can optionally be operated in two way active mode just by changing the configuration of the D12 amplifier, without any modifications to the loudspeaker. Its frequency response extends from 55 Hz to above 17 kHz.

The M4 cabinet is constructed from marine plywood and has an impact resistant paint finish. The front of the loudspeaker cabinet is protected by a rigid metal grill in front of a replaceable acoustically transparent foam. The side panels incorporate a pair of handles a pole mount socket and M10 threaded inserts to connect to different rigging device and brackets. Two runners recessed in its bottom panel prevent the cabinet from scratching and unwanted movement.

Connections

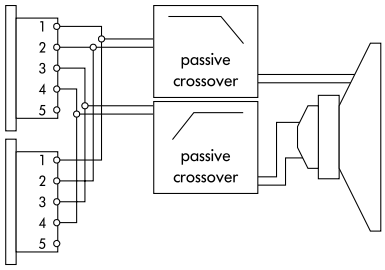


Fig. 2: Connector wiring

The M4 cabinet is fitted with a pair of EP5 connectors. All pins of both connectors are wired in parallel. Using the male connector as the input, the female connector allows for direct connection to additional loudspeakers.

The M4 can be supplied with NL4 output connectors as an option. Pin equivalents of EP5 and NL4 connectors are listed in the table below.

	LF +	LF –	HF +	HF –	n.a.
EP5	1	2	3	4	5
NL4	1+	1–	2+	2–	n.a.

Tab. 1: EP5 and NL4 pin assignments

Operation with D12

CAUTION!

Only operate M4 loudspeakers with a d&b amplifier configured for the M4 otherwise there is a risk of damage to the loudspeaker components.

The D12 allows the M4 cabinet to be driven either in "2-Way Active" mode or in passive mode.

Active operation ("2-Way Active")

IMPORTANT!

Selecting "2-Way Active" mode with the M4 set up enables up to two M4 cabinets to be driven actively by the D12 amplifier. In applications with low continuous levels and low ambient temperatures up to three cabinets may be connected.

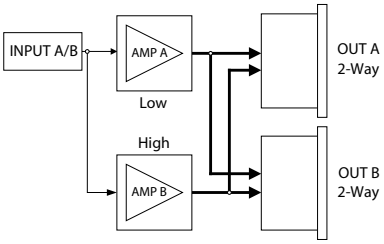


Fig. 3: D12 Output routing "2-Way Active"

In "2-Way Active" mode the D12 routes separate LF and HF signals to the amplifier channels. Pins 1/2 of both EP5 output connectors (NL4: 1+/1–) carry the LF signal, pins 3/4 (2+/2–) carry the HF signal. The output connector pin assignment is set automatically when "2-Way Active" mode is selected. The input signal can be fed either input (to be selected in the D12 menu) and is routed (linked) to both amplifier channels internally.

IMPORTANT!

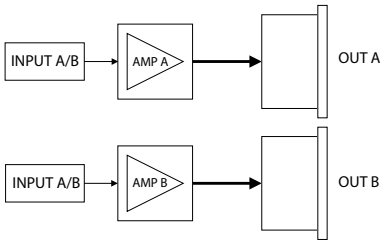


Fig. 4: D12 Output routing "Dual Channel"

Passive operation ("Dual channel" mode)

Selecting "Dual channel mode" with the M4 set up enables up to two M4 cabinets to be driven by the respective channel. In applications with low continuous levels and low ambient temperatures up to three cabinets per channel may be connected.

In "Dual channel" mode each amplifier channel is driving all output pins of its respective output connector thus driving the cabinets HF and LF sections via their passive crossover networks. Pins 1/3 of the EP5 output connector (NL4: 1+/2+) carry the positive and pin 2/4 (1–/2–) carry the negative components of the signal.

Passive operation ("Mix TOP/SUB" mode)

With its standard connector wiring the M4 requires 4 wires to be driven and therefore it cannot be used in "Mix TOP/SUB mode". However, for permanent passive use with a dedicated cabling the M4 set up is also available in "Mix TOP/SUB mode".

Controller settings

For acoustic adjustment the functions CUT, HFA and CPL can be selected.

CUT circuit

Set to CUT, the M4 low frequency level is reduced. The M4 is now configured for use with the Q-SUB, J-SUB or d&b C-Series subwoofers.

HFA circuit

In HFA mode (High Frequency Attenuation), the HF response of the M4 system is rolled off. The HFA provides a natural, balanced frequency response when a cabinet is placed close to listeners in near field or delay use.

High Frequency Attenuation begins gradually at 1 kHz, dropping by approximately 3 dB at 10 kHz. This roll-off mimics the decline in frequency response experienced when listening to a system from a distance in a typically reverberant room or auditorium.

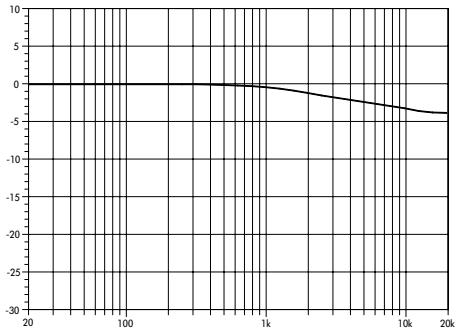


Fig. 5: Frequency response correction of HFA circuit

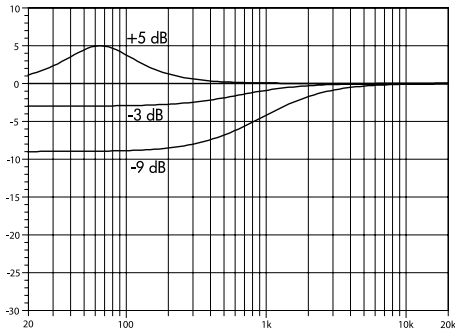


Fig. 6: Frequency response correction of CPL circuit

CPL circuit

The CPL (Coupling) circuit compensates for coupling effects between the cabinets when building closely coupled arrays. CPL begins gradually at 1 kHz, with maximum attenuation below 400 Hz, providing a balanced frequency response when M4 cabinets are used in arrays of two or more. The function of the CPL circuit in the D12 amplifier is shown in the diagram opposite and can be set in dB attenuation values between –9 and 0, or a positive CPL value which creates an adjustable low frequency boost around 65 Hz (0 to +5 dB).

Operation with E-PAC

Selecting M4 mode enables the E-PAC to drive one M4 loudspeaker. LO IMP mode configures the E-PAC to drive a maximum of two M4 loudspeakers with a 6 dB reduction in input level to the loudspeakers.

The CUT and HFA settings are available. The characteristics are described under the previous section "Operation with D12".

Dispersion characteristics

The graphs below show dispersion angle over frequency of a M4 cabinet plotted using lines of equal sound pressure (isobars) at –6 dB and –12 dB. The characteristics refer to monitor operation. When used as a front-of-house system the horizontal dispersion corresponds to the vertical plot and vice versa.

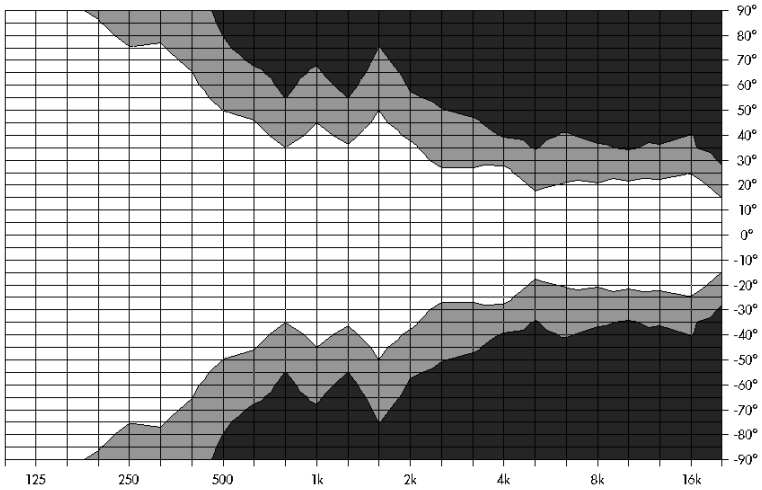


Fig. 7: Isobar diagram M4 horizontal, monitor set up (vertical, front-of-house set up)

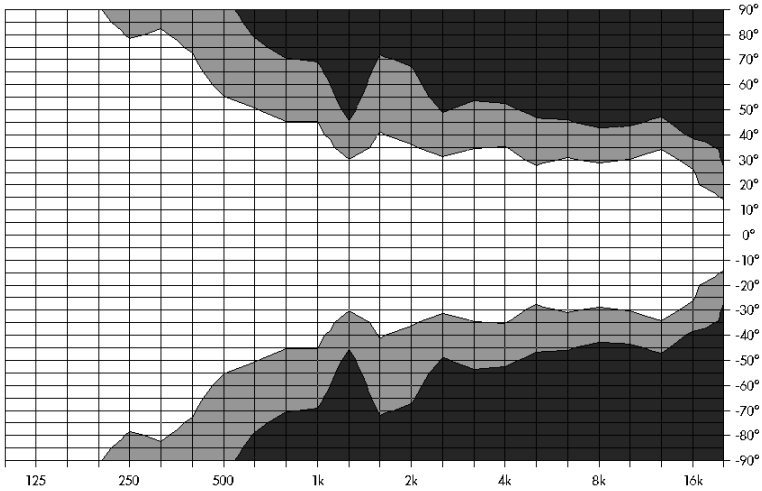


Fig. 8: Isobar diagram M4 vertical, monitor set up (horizontal, front-of-house set up)

Altering the dispersion characteristics

For dedicated installation applications the dispersion characteristics of the driver and horn assembly can be rotated in increments of 45°. Proceed as follows:

Tools required: Torque wrench with Torx nut #25

1. Undo the 10 screws holding the front grill and remove the front grill.
2. Undo the screws holding the horn flange and two opposite screws at the 15" driver for the desired orientation.
3. Rotate the horn to the desired orientation and refit all screws and tighten them using a torque setting of 4 Nm.
4. Refit the front grill and tighten all screws using a torque setting of 4 Nm.

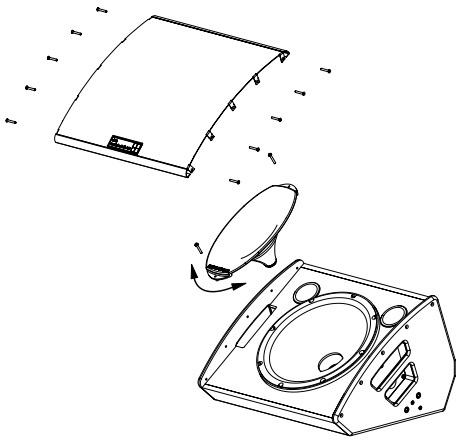


Fig. 9: Altering the dispersion characteristics

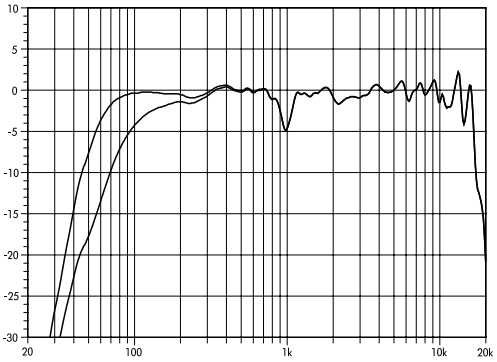


Fig. 10: M4 frequency response, standard and CUT settings

Technical specifications

M4 system data

Frequency response (–5 dB standard).....55 Hz ... 17 kHz
Frequency response (–5 dB CUT mode).....95 Hz ... 17 kHz
Max. sound pressure (single cabinet, 1 m, free field) D12 passive mode ....138 dB
Max. sound pressure (single cabinet, 1 m, free field) D12 active mode .....140 dB
Max. sound pressure (single cabinet, 1 m, free field) with E-PAC .....134 dB
(SPLmax peak, pink noise test signal with crest factor of 4)

Input level (100 dB-SPL/1 m).....–22 dBu
Polarity to controller INPUT (XLR pin 2: +/3: –) passive mode.....LF: –/HF: +
Polarity to controller INPUT (XLR pin 2: +/3: –) active mode .....LF: –/HF: –

M4 loudspeaker

Nominal impedance.....8 ohms
Power handling capacity (RMS / peak 10 ms).....400/1600 W
Nominal dispersion angle (hor. x ver., monitor set up.).....50° x 70°
Components.....15" driver with neodymium magnet
.....coaxial 1.3" exit compression driver with 3" coil and CD horn
.....Passive crossover network
Connections.....2 x EP5
.....(optional 2 x NL4)
Pin assignments.....EP5: 1: LF+/2: LF–/3: HF+/4: HF–
.....NL4: 1+: LF+/1–: LF–/2+: HF+/2–: HF–
Weight.....20 kg (44 lb)

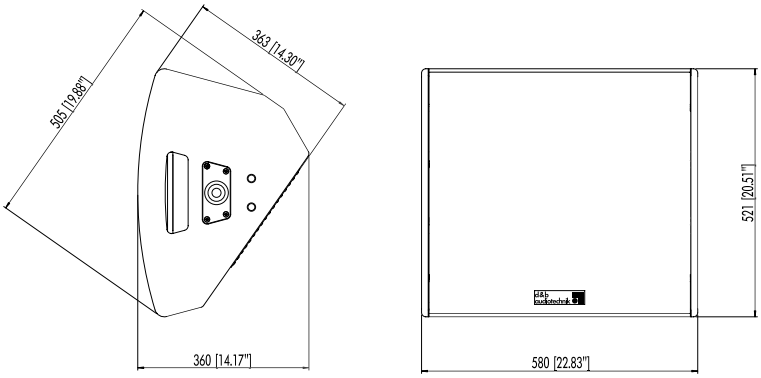


Fig. 11: M4 cabinet dimensions in mm [inch]

EU declaration of conformity (CE symbol)

CE

EU conformity of loudspeakers

This declaration applies to loudspeakers manufactured by d&b audiotechnik AG and includes the types listed in the table below:

- **M4 loudspeaker Z0800**

All production versions of these types are included, provided they correspond to the original technical version and have not been subject to any later design or electromechanical modifications.

We herewith declare that said products are in conformity with the provisions of the following EC directives including all applicable amendments:

- **89/336 Electromagnetic Compatibility**

The following standards have been applied:

- **DIN EN 55013:08-1991**
- **DIN EN 55020:05-1995**
- **DIN EN 50082-1:03-1993**

D2990.EN .01, 05/2006 © d&b audiotechnik AG

d&b audiotechnik

d&b audiotechnik AG, Eugen-Adolff-Str. 134, D-71522 Backnang, Germany, Phone +49-7191-9669-0, Fax +49-7191-95 00 00