5. Specifications and Dimensions

General Specifications	
Type	Active 2-way system, analog electronics
Frequency Range	30 Hz – 40 kHz
Crossover Frequency	330 Hz
Max. Sound Pressure Level	110 dB/1 m short-time (peak)
Limiter	Separate limiters for the HF and LF path, optocoupler circuit prevents signal degradation
Input Connector	XLR-3 (balanced, PIN 2 = signal +)
Mains Connector	230 VAC, 50/60 Hz, internally switchable to 120 VAC, IEC socket with replaceable fuse
Mains Fuse	5 AT (230 V), 6.3 AT (120 V), fuse type: micro-fuse 5 x 20 mm
Power Indicator	LED green
Limiter Indicator	LED green/red
Dimensions (H x W x D)	19.5" x 10.6" x 16.7"
Weight	66 lbs/30 kg
Sound Transducer	
HF	Manger Sound Transducer, band width 80 Hz – 40 kHz, rise time 13 µs
LF	8" fiber glass-polyester sandwich construction, 38 mm voice coil diameter
Enclosure	Closed, separate chambers with elaborate and meticulously adapted damping
Amplifier Section	
Maximum Output Power	LF: 250 W in 8 ohms, 400 W in 4 ohms (with optional LF-Module)
	HF: 180 W in 8 ohms
Power Band Width	HF 250 kHz (-3dB)
Input Sensitivity	6 dBu (1.54 V) or 0 dBu (0.775 V)
Input Impedance	10K ohms
Control Switches	Input Trim switch: 11 positions (-2.5 dB to 2.5 dB)
	Input Sensitivity switch: 6 dBu/0 dBu
	Polarity switch: 0°/180°
	AV-filter: high-pass filter (80 Hz, 12 dB/oct.)
	Ext. LF-Module switch: 0 dB/-6 dB
	Room Acoustics Correction switch: shelving filter at 100 Hz (+3 dB, 0 dB, -3 dB, -6 dB)
	Nearfield-/Cinema Screen Correction switch: bell filter at 3.25 kHz, 1.0 oct. (+3 dB, 0 dB, -1.5 dB, -3 dB)
	High Frequency Trim switch: shelving filter at 10 kHz (+2 dB, +1 dB, 0 dB, -1 dB, -2 dB)
Options	MSM stand, rolling stand, customizable height up to 39.8" (bottom edge MSMc1)
	MSM lift, rolling stand, height-adjustable, 30.7" – 42.5" (bottom edge MSMc1)
	MSMc1 LF-Module, bass extension for large rooms or higher SPLs

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MANGER
PRECISION IN SOUND

MSMc1 Studio Reference Monitor

2-Way Active Monitor System

Owner's Manual

1. Safety Instructions

1. Important Safety Instructions

- Read these instructions carefully before operating the Manger studio monitor.
- Heed the warnings on the rear panel of the unit.
- Refer opening of the unit to qualified service personnel. If the unit has to be serviced or opened, for example, under our supervision, you must disconnect it from the mains.
- Unplug the unit during lightning storms or when unused for long periods of time.
- Clean the unit only with a dry cloth.
- For safe operation the ventilation openings and rear panel must no be blocked.
- Do not expose the unit to direct sunlight and do not install it near radiators or other heat sources.

Caution!

Do not expose the unit to rain or moisture and do not place objects filled with liquids, e. g. vases, glasses oder bottles, on the unit. This could damage the unit and constitutes a risk of electric shock to persons!

2. Before You Power Up the System

2.1 Introduction

Thank you very much for choosing a Manger product. We at Manger ensured that your new studio monitor reflects our philosophy "Precision in Sound" in every detail. This becomes evident not only in the precision of manufacturing but also in the way the MSMc1 reproduces music and other sound events. You will feel like you are looking through a magnifying glass and discover the slightest nuances of music. Only innovative technology and a totally new approach to sound transducers can accomplish this. The Manger Sound Transducer (MSW) is a tool that enables you as a professional to complete your work with precision and ease at the highest level and over long periods of time without hearing fatigue. Music lovers will be pleased to learn that the MSW reproduces the wealth of musical details in such an effortless and authentic way that you will refuse to stop listening. So no matter if you are a music professional or aficionado we hope you share our enthusiasm for this amazing product and enjoy the new sonic experience it offers.

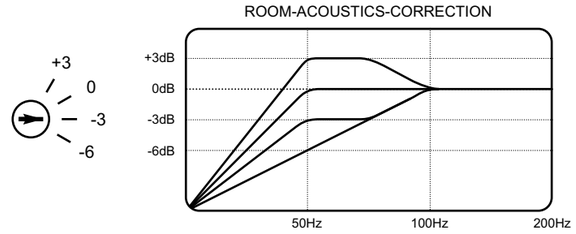
Our slogan "Precision in Sound" not only describes the reproduction quality of our products but also symbolizes highest precision and quality at all levels of our work: Our sound transducers are manufactured with the precision of a watchmaker. Our sound systems are assembled and tested with the same precision. And our products are handed over to our customers and serviced in exactly the same manner. So if your Manger product should not work the way you expect it to or if you want to share your experience with the Manger Sound Transducer, do not hesitate to contact us. We will immediately support you with words and deeds and live up to our excellent reputation.

2.2 Table of Contents

5. Working with the MSMc1 Studio Monitor

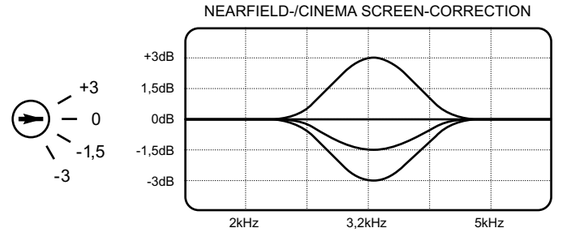
3.3.6 Room-Acoustics-Correction

This rotary switch is used to adapt the MSMc1 in different set-ups to the room acoustics or the room geometry. The shelving filter has a slope of 6 dB/oct. and a cut-off point of 100 Hz.
Please use this rule of thumb for your settings: 0 dB for free monitor placements in the room, -3 dB for placements close to a wall and -6 dB for placements in corners. A boost by 3 dB is also possible. The diagram below shows the different effects.



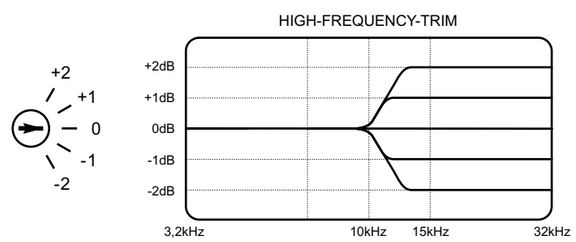
3.3.7 Nearfield-/Cinema Screen-Correction

This filter has been developed especially for near-field applications and emulates the hearing sensitivity curves according to Robinson-Dadson (see also Fletcher-Munson). They state that the sensitivity of the human ear reaches its peak between 3 kHz and 4 kHz. By attenuating this range by -1.5 dB or -3 dB you can counteract this raised sensitivity especially at high listening volumes. On the other hand, by boosting this range by 3 dB you can compensate for the damping caused by numerous commercially available perforated studio screens. You should apply this boost when the MSMc1 studio monitor is set up behind such screens. The diagram below shows the different effects.



3.3.8 High-Frequency-Trim

This shelving filter can be used to cut or boost frequencies above 10 kHz at a slope of 6 dB/oct. in 1 dB steps. Use this filter to compensate for extreme air damping (e. g. temporary high humidity) or irregularly damped rooms (loss of highs) by boosting the treble range. Attenuation may be necessary when strong reflections in the listening room boost the treble range. This switch can also be used to adapt the system to your personal taste and individual preferences.

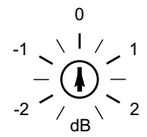


3.3 Back Panel Controls

Use the supplied screwdriver to adjust the "INPUT TRIM", "ROOM-ACOUSTICS-CORRECTION", and "NEARFIELD-/CINEMA rotary switches.

3.3.1 Input Trim

The Input Trim rotary switch is used to finetune the input sensitivity in 0.5 dB steps in the range of -2.5dB to +2.5dB. This can be used to compensate for tolerances in the signal path (e. g. mixer output) and adjust a precise acoutical stereo center. The default value is 0dB.



INPUT TRIM

3.3.2 Input Sensitivity

The Input Sensitivity switch is used to set two sensitivities:
OFF for the standard studio sensitivity of 6 dBu (full-scale level of the HF power amplifier at 1.54 V)
ON for the higher sensitivity of 0 dBu (full-scale level at 0.775 V), e. g. for directly connecting a CD player with adjustable output to the studio monitor.

INPUT SENSITIVITY: OFF = +6dBu, ON = 0dBu

3.3.3 Polarity

When set to ON the Polarity switch inverts the signal phase by 180°. This function can be used to temporarily compensate for phase errors between the channels or to change the polarity of the entire studio monitoring system (all monitors used).
Researches have shown that positive excursions of the microphone diaphragm followed by positive excursions of the woofer improve the dimensionality and spatial imaging of the music. In the OFF position the positive input signal is followed by a positive excursion (outward).

POLARITY: ON = INVERSE

3.3.4 AV-Filter

The ON position activates a high-pass filter at 80 Hz with a slope of 12 dB/oct. in the bass path only. This function is useful when a subwoofer is added or when you mix in small rooms and the bass range needs to be attenuated.

AV-FILTER, 80Hz, 12dB/oct.

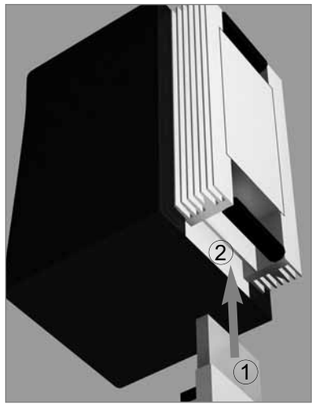
3.3.5 External Manger LF-Module

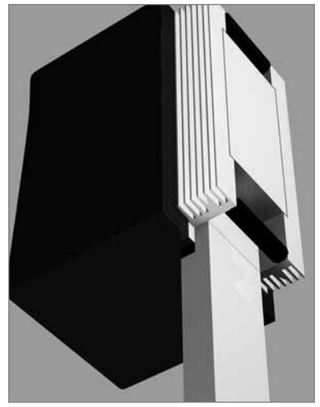
An additional bass module can be used to increase the maximum sound pressure level by 6 dB (see also 3.2 Limiter and 2.5.1 LF-Module). The module is connected to the Speakon output via special cable. To preserve the level balance between treble and bass path this switch has to be set to ON.

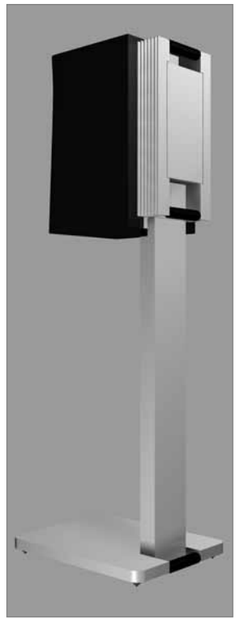
EXT. MANGER LF-MODULE

2.3 Unpacking and Setting Up the MSMc1 Studio Monitor

Handles come in handy when you have to lift a 66 lbs studio monitor out of its cardboard box. We conceived, designed and implemented them – the MSMc1 is now equipped with two nice and useful handles. Please set down the box in such a way that you can read the caption on the front side. Use a short knife to open the box and remove the blue polystyrene frame from the back of the monitor. Now you can lift the enclosure by its handles out of the box. Place the monitor on a soft surface. Place the readily mounted speaker stands at their intended position in the room. If possible, ask someone for help. Despite the convenient handles four arms can lift the monitor up to the stand much easier. Grasp the lower handle with one hand and hold the monitor's enclosure above the Manger Sound Transducer with your other hand. The second person should stand in front of the MSMc1, reach under the enclosure and help you lift up the monitor and insert the plastic block (1) into the pocket (2) of the monitor electronics.







Did you know, that the MSM stand and the studio monitor can be rolled together? Simply hold the monitor by its handles and tilt the whole assembly backwards a little. Now you can use the roller, which is integrated into the stand's socket and looks like a handle, to roll the assembly like a dolly to its new position. Of course, the monitor should not be moved over long distances in this manner, since this would overstrain the small handle roller. For example, use this handy option to roll the unit to its correct position in the control room and align it towards the listening position.

2.4 Aligning the MSMc1 Studio Monitors

In general the MSMc1 is designed for vertical (upright) placement. We recommend using the "MSM stand" or the "MSM lift" for varying heights. These stands and the MSMc1 form an entity – visually as well as functionally. The height of the monitors (center of MSW) depends on the height of your ears. For listening in stereo choose a suitable base width and direct the radiation axes to your ears, if your environment allows for it. In an ideal constellation the left and right loudspeaker enclosures and your listening position form an equilateral triangle.

In multi-channel listening environments (5.1 - 7.1) the height of the monitors also depends on the height of your ears. For a description of the horizontal placement please browse the common information platforms, such as ITU, DOLBY, etc. or visit our website under www.manger-msw.com.

2. Before You Power Up the System

2.5 Connections

2.5.1 Audio Connections

The balanced XLR input (3) of the MSMc1 can be connected to the balanced signal source of a professional device (mixing console, preamplifier, audio interface, etc.). The XLR input of the MSMc1 can also be connected to consumer devices with unbalanced outputs (RCA). In this case PIN 3 (signal -) must be connected to PIN 1 (shield) on the RCA side of the (balanced) connection cable. A suitable cable can be ordered from Manger Products.

2.5.2 Mains Connection

Connect the supplied mains cord to the IEC socket (4) of the MSMc1 and a grounded mains outlet. At the factory the MSMc1 has been set to a supply voltage of 230 V/50-60 Hz. For countries using 120 V/50-60 Hz the supply voltage can be switched internally (by Manger Products). After power-up the signal is delayed for two seconds before it reaches the loudspeaker. The mains fuse is housed adjacent to a replacement fuse in a retainer inside the IEC socket. If the fuse has to be replaced you can use the supplied screwdriver to access it.

2.6 Options

2.6.1 LF-Module

The optionally available LF-Module increases the overall sound pressure level of the MSMc1. The enclosure features the same rounded edges as the MSMc1 and employs another customized woofer which increases the listening level by 6 dB without altering the overall frequency response (refer to chapter 3.2 Limiter). Place the LF-Module on top of the MSMc1 enclosure and exactly align the edges of both units. The rubber feet inserted into the bottom side of the LF enclosure prevent it from slipping even at high listening levels. Use the supplied special cable to connect the LF-Module to the amplifier unit. To establish electrical contact you must turn the Speakon connectors to the right to lock them. After you have made the connection set the sliding switch named "Ext. Manger LF-Module" to ON (see paragraph 3.3.4). Never connect third party woofer systems or subwoofers to the MSMc1 to prevent damage to the electronics.

2.6.2/3 MSM Stand/MSM Lift

The"MSM lift" is a height adjustable version of the "MSM stand" (see also 2.3 and 2.4). The MSM lift is equipped with a hydraulic cylinder and allows height adjustments from 30.7" to 42.5" (bottom edge of the MSMc1 enclosure) or from 45.6" to 57.5" (center of MSW). The MSM lift comes in handy when the listening height will be changed occasionally or frequently. For example, when listeners are standing or when the listeners' body heights differ considerably and their office chairs are not height adjustable. Or when you want to make sure that you can replace your couch with a new model of different height without having to dispose the speaker stands. A little lever at the upper end of the stand shaft lets you lift up the 66 lbs studio monitor effortlessly. Hold the lever and lower rear handle with one hand and slide the monitor upwards while you press the lever.
To reduce the height put one hand on the upper side of the MSMc1 and push down the enclosure while pressing the lever with your other hand.
Only press the little lever when the MSM lift is "loaded", i. e. a studio monitor sits on top of the stand, or else the pretension of the hydraulic cylinder will make the MSM lift bounce up rapidly to its maximum height.

3. Working with the MSMc1 Studio Monitor

3.1 Front Panel Displays

In addition to the distinctive Manger Sound Transducer and the woofer (behind a speaker grill) there are two LEDs on the bottom margin of the front panel. They have different functions:
- The left LED lights green when the studio monitor has been connected to the mains and switched on.
- The right LED also lights green when the internal limiter is switched on, but inactive. The LED blinks red or lights constantly red when the limiter is actively limiting the level of the treble or bass path or both. More details in the next chapter "3.2 Limiter". When the right LED does not light the limiter has been switched off permanently.

3.2 Limiter

The limiter has been designed by Manger especially for the MSMc1 and provides several useful functions:
- An optocoupler circuit prevents detrimental components in the signal path.
- Separate limiters protect the woofer and the MSW against overloads.
- Different attack and release times for the woofer and MSW path ensure optimum calibration.
- The limiter can be switched off, if necessary.
- A LED displays the limiter status (of both signal paths) in two colors.

As a special feature the limiter is able to offset the limiting threshold by 6 dB and thus increase the listening level when an additional woofer is used. To make this feature work the treble and bass paths have to be processed separately and each path has to be equipped with its own limiter.

When the MSMc1 is used without the additional LF-Module the woofer represents the level-limiting component of the system as it will activate the limiter before the MSW does. Listening to (bass-heavy) music near the threshold or above it can result in the bass path being limited before the treble path. When the signal level is further increased only the treble path (MSW) will get louder and the frequency response will be warped.

As soon as the limiter is activated (right LED blinks or lights red) you should decrease the listening level to the point where the LED stops blinking red and constantly lights green to prevent any degradation in reproduction quality.

For example, when you use the MSMc1 studio monitor in highly damped or very large rooms or with constantly high listening levels and the limiter comes on regularly, you should definitely expand the system with a LF-Module.

If you want to do without the limiter's protection against woofer and MSW overloads we can switch the limiter off for you. After that the LED will not light anymore. This action will void any warranty claims with respect to MSWs and woofers damaged by overloads.