

7300 Series

Operating Manual 操作手册

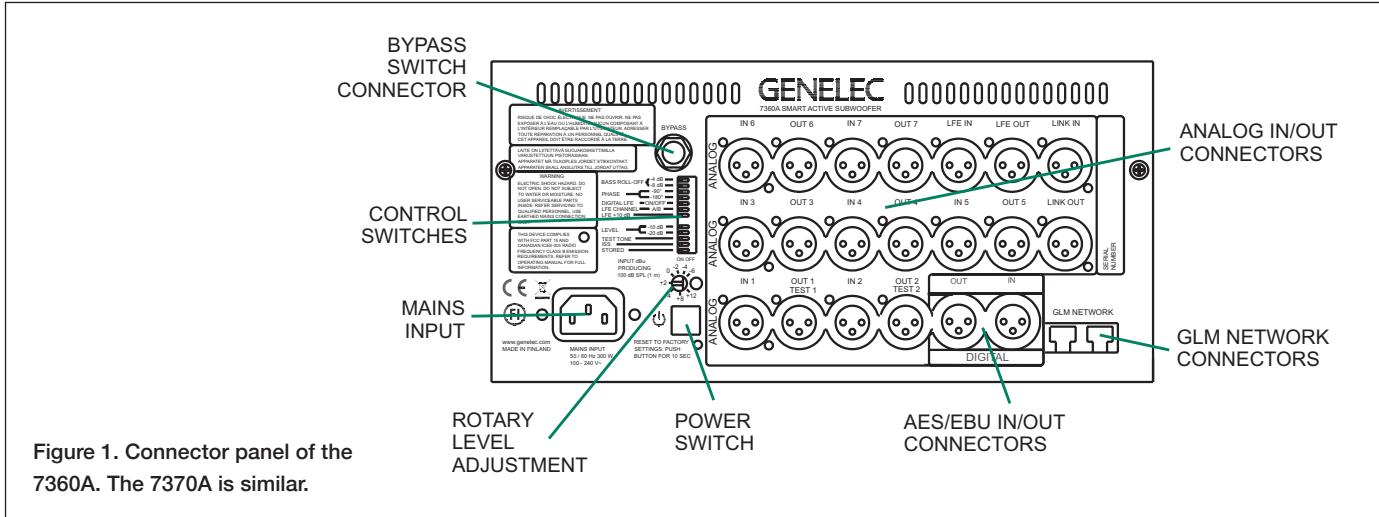
Genelec 7360A and 7370A Smart Active Subwoofers
真力 7360A 和 7370A 智能有源超低音箱

GENELEC®



Genelec 7360A and 7370A Smart Active Subwoofers

Introduction	Analog Output 1 thru 7	MAINS INPUT
<p>Congratulations and a thank-you for the purchase of this Genelec 7300 series subwoofer. This manual addresses setting up and using the Genelec 7360A and 7370A subwoofers. These subwoofers are designed to integrate easily into all environments, both those using analog audio as well as those using digital AES/EBU audio. Genelec 7360A and 7370A subwoofers are designed for precise monitoring of multichannel analog audio signals and stereo AES/EBU signals. Multichannel AES/EBU signal can be monitored by using the 9301A multichannel digital audio interface device connected to the subwoofer.</p> <p>Energy saving Intelligent Signal Sensing (ISS) can be turned on to put the subwoofer automatically into a standby state when audio signal has been absent for a selected time. In the standby mode the product consumes less than one Watt of power. Upon sensing an input signal the subwoofer automatically wakes up to full operation. The wait until entering the ISS power save can be configured using the Genelec Loudspeaker Manager (GLM) software. When the ISS is active you can have your monitoring system ready for action at all times.</p>	<p>Balanced XLR connectors for connecting the main monitors to the subwoofer. Depending on the chosen mode of bass management, these outputs may carry either unfiltered or high-pass filtered signal to the main monitors. See chapter "Bass Management" for details.</p> <p>LFE Out Straight thru-put of the LFE In. Typically LFE Out will be connected to LFE In when using multiple subwoofers.</p> <p>Link Out Combined summation of main inputs 1 thru 7 that are passed along to a second or more daisy-chained subwoofers. See chapter "Using Multiple Subwoofers."</p> <p>Link In Use this input when daisy-chaining subwoofers. Accepts ONLY the signal from Link Out. Analog inputs 1-7 should not be used when Link In is connected. See chapter "Using Multiple Subwoofers."</p> <p>OUT1 / Test 1 Passes the 85 Hz Phase Test Tone when used in the Stand Alone Manual Mode. Enabled with the Dip Switch labeled Test Tone.</p> <p>OUT2/Test 2 Reserved for future use.</p> <p>AES/EBU IN Two channel AES/EBU input.</p> <p>AES/EBU OUT Output is straight thru-put of AES/EBU IN.</p> <p>BYPASS Bass manager subwoofer Bypass. For use with Stand-alone Manual mode. Accepts a TRS/TS contact open/close device.</p> <p>GLM NETWORK Two CAT5 (RJ45) GLM Network connectors for computer control using the Genelec Loudspeaker Manager (GLM) software.</p>	<p>Supports a wide mains voltage range (100-240 VAC, 50-60 Hz) and enables the subwoofer to be plugged in anywhere globally. If the mains power is provided with a generator, inverter or certain lower-quality UPS devices, we recommend filtering of the mains power voltage harmonics and taking care that the voltage supply is stable.</p> <p>Bass Management Bass management splits the signal from each input into low and high frequency components. Signal content below the crossover frequency is reproduced by the subwoofer and signal content above the crossover frequency is reproduced by the monitors connected to the outputs of the subwoofer.</p> <p>The 7360A and 7370A offer two bass management methods:</p> <p>Centralized bass management This method builds both the highpass and the lowpass filters in the subwoofer and can be used in all setups, with or without GLM control. A fixed 85 Hz crossover filter for the analog main channels is default for manual stand-alone use. However, we recommend the use of the much more flexible distributed bass management method.</p> <p>In this method all analog signal cables are routed through the subwoofer's IN/OUT connectors to the respective main monitors.</p> <p>Distributed bass management In this method the lowpass filter is applied in the subwoofer and the highpass filter in the monitor, and these are set in synchrony using the GLM network. This method is only available in systems where GLM is used.</p> <p>The GLM management software enables adjusting the subwoofer/monitor crossover from 50 Hz to 100 Hz when distributed bass management is used.</p> <p>The distributed bass management supports three different signal cabling configurations:</p> <ul style="list-style-type: none"> • All channels routed through the subwoofer's IN/OUT connectors to the respective monitors.



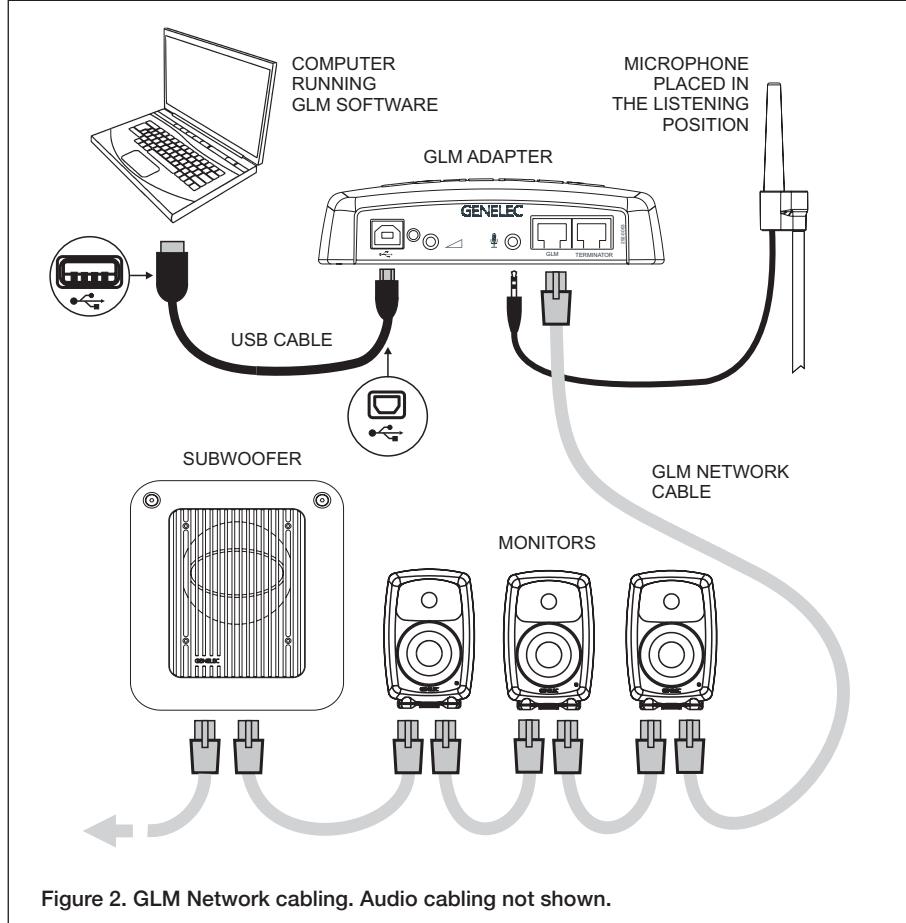
- Y-cables from the source to the subwoofer's IN connector and the monitor's signal input.
- Signal sources with dual outputs for each channel.

Use With GLM™ Control Network

Subwoofers are fully compatible with Genelec Loudspeaker Manager GLM™ and the proprietary Genelec monitor control network and Genelec SAM monitors. Using the GLM control method unleashes the full room compensation power in the subwoofer, with 20 parametric room compensation filters. This level of room compensation detail is only available when the GLM is used. Use with the GLM™ network is described in the GLM System Operating Manual.

System setup

Although the subwoofer can be used without the GLM™ software and control network, they only reach their full potential when set up and calibrated using the GLM™ software. Genelec Loudspeaker Manager GLM™ and the proprietary Genelec monitor control network offer automated acoustic equalization and alignment for any reproduction system from simple stereo to very complex 3D immersive setups including also one or more subwoofers. GLM setup is fast and accurate and can precisely address the typical narrow-band low frequency mode resonances of a room, or typical radiation load frequency response compensation. The settings can be controlled with a computer or be permanently stored in the monitors to make the setup available at all times even



when a computer is not in use. Genelec recommends setting up SAM monitoring systems using GLM. You can find a detailed description of the setup and the use of GLM™ in the GLM™ System Operating Manual.

The setup is fast and consists of the following steps:

- Connect a CAT5 (RJ45) cable between each monitor (and subwoofer) and finally to the control network input of the GLM Adapter device (see Figure 1).
- Connect the GLM Adapter device to computer USB connector.
- Using a microphone stand, place the Genelec measurement microphone at the listening location with the microphone

pointing upwards and the microphone top at the height of the engineer's ear. The microphone is a part of the GLM User Kit.

- Connect the microphone cable to the microphone input in the GLM Adapter device.
- Download the GLM software at the Genelec web site (www.genelec.com).
- Install the GLM software and follow the instructions in the software to measure and set up your system.
- If you plan to not use a computer for controlling the monitors, use the GLM software to write the setting into the monitors (use menu item "Store | Store the Current Group Settings...").

While the GLM network is disconnected the settings stored using the Genelec Loudspeaker Manager software can be retrieved and activated by setting the STORED switch ON.

With GLM active and controlling the subwoofer, the use of analog or digital inputs is forced by the "Input Type" in the Group. In standalone manual mode, AES/EBU digital signal will override analog signal if valid digital clock is detected.

Using standalone Stored Settings, the input type defined by the Group is used.

Use Without GLM

Cabling

These subwoofers can be easily set up using the fixed 85 Hz analogue crossover filter. This fixed crossover filter is on as a factory setting and highpass filters the analogue outputs on the subwoofer. When using this method, run each signal cable first to the subwoofer. Then, run the respective output to the monitor. This monitor feed signal is highpass filtered at 85 Hz.

When using the LFE signal, run the LFE signal to the subwoofer LFE in connector.

Control Switches

BASS ROLL-OFF controls compensate for the very low frequency boost, reducing the 20 Hz level in 4 dB steps. The settings add to a total of 12 dB attenuation. Setting both switches to "OFF" obtains a flat response.

PHASE switches can put the subwoofer in phase with a selected main monitor. Incorrect phase alignment can cause a drop

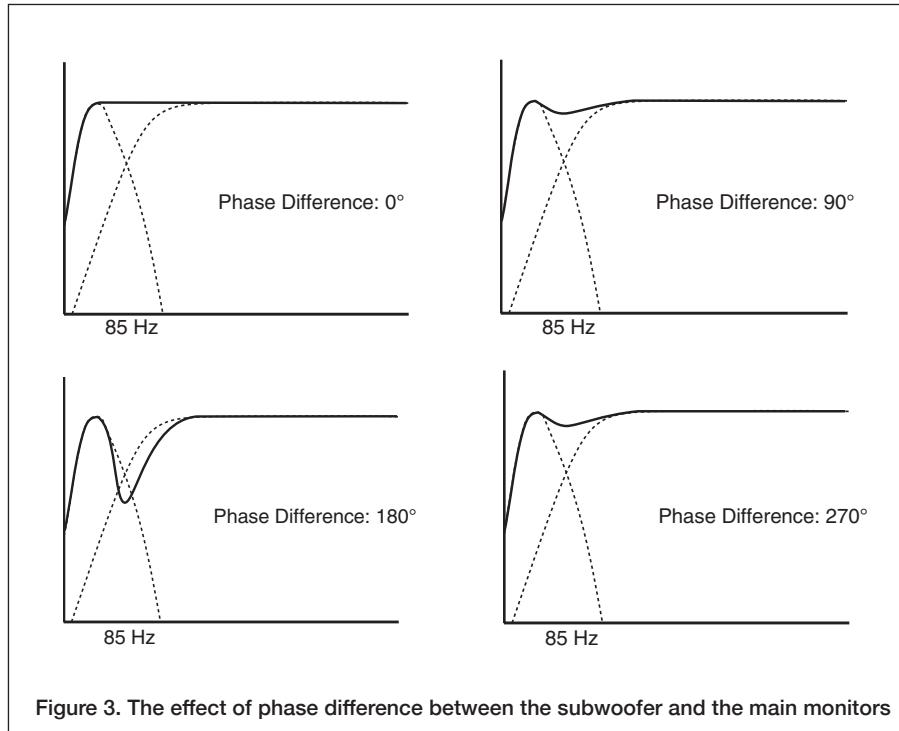


Figure 3. The effect of phase difference between the subwoofer and the main monitors

in level at the crossover frequency. See chapter "Setting the Phase Switches."

Digital LFE switch selects the low pass frequency for the subframe selected to reproduce LFE (see "LFE CHANNEL" below). The frequencies are 85 Hz for "OFF" and 150 Hz for "ON."

LFE CHANNEL A/B selects which subframe carries the LFE signal. "ON" for A, "OFF" for B. If A is selected for LFE, the B subframe is assumed to carry main channel audio.

LFE +10 dB function adds +10 dB of gain. See chapter "Using the LFE +10 dB function."

LEVEL switches scale down the subwoofer output level. The switch settings add up and combine with the rotary level adjustment control.

TEST TONE switch activates the 85 Hz test tone used for calibrating the phase. See chapter "Manual Phase Adjustment Method"

ISS switch activates the signal sensing automatic energy saving function.

STORED switch selects the settings stored inside the memory of the subwoofer

and settings made by the subwoofer's controls. The stored settings are set using the GLM Loudspeaker Manager Software and the GLM control network and provide superior functionality compared to the subwoofer's own controls.

Connector Panel Light

Normally, the light on the connector panel is green, indicating normal operational mode. Red colour indicates amplifier clipping and yellow indicates thermal overload. If the red or yellow warning light appears, turn down the level.

Setting the Phase Switches

Incorrect phase alignment between main monitors and subwoofer causes a drop in the frequency response of the whole system at the crossover frequency. Figure 3 shows the effect of phase difference to the frequency response.

The phase difference between the main monitors and subwoofer at the listening position depends on the position of the subwoofer, so the phase adjustment should be done only after the preferred position is found and subwoofer and monitor levels have been aligned. GLM software control adjusts the phase automatically, but if GLM is not available, the following manual phase matching can be applied.

Manual Phase Adjustment Method

Genelec 7360A and 7370A subwoofers are equipped with a built-in 85 Hz frequency test tone generator for phase alignment. The test tone generator is connected to the subwoofer's "TEST 1" output. Connect temporarily a monitor to this output for manual phase alignment.

Power up the system and set the TEST TONE switch to "ON." Now you can hear an 85 Hz test signal from the subwoofer and the main monitor connected to the center channel output.

1. Toggle the -180° phase switch on and off, and set it to the position which gives the lowest sound level at the listening position.

2. Next toggle the -90° phase switch on and off, and again set it to the position which gives the lowest sound level.

3. Finally, set the -180° phase switch to the opposite setting and deactivate the test signal. The phase adjustment is now complete.

Using the LFE +10 dB Function

Dolby Digital and DTS encoding formats present the LFE channel with +10 dB gain relative to the main channels. Surround sound decoders may automatically add +10 dB of LFE gain to restore the level balance.

The "LFE +10 dB" function can add the +10 dB of gain to the LFE channel in the production stage if it is not already done by the source connected to the monitoring system. Switching the "LFE +10 dB" switch to the "ON" position activates the function. If the LFE output is at a 10 dB higher level than other (non-LFE) channels, this switch should be set to "OFF".

The "LFE +10 dB" function should not be used in the following cases:

- If the +10 dB LFE gain is already implemented by another device, for example, a surround sound processor or the output matrix of a mixing console.
- When producing an audio format that does not require the use of +10 dB gain on the LFE channel.

Additional Information

Positioning Subwoofer in Room

The location of the subwoofer can affect the frequency response and sound level dramatically particularly when the room acoustic effects are strong. Even small changes in a subwoofer's location can make a marked difference in the frequency response. To begin, place the subwoofer at the front wall slightly offset from the room center line. Often methodical experimentation is needed to find the location giving the flattest frequency response at the listening location. Usually the subwoofer is placed close to a wall as this usually creates the highest output. Positioning the subwoofer close to a corner will boost the bass level at lower frequencies and may also cause asymmetrical spatial imaging. Measured from the subwoofer's driver the recommended distance to a wall is less than 0.6 m (24 in). Cancellations from the wall are then avoided.

Operating Environment

These subwoofers are designed for indoor use only. The permissible ambient temperature is 15-35 degrees Celsius (50-95°F) and relative humidity 20% to 80% (non-condensing). When the product has been stored or transported in cool environment and is taken into a warm room, wait 0.5-1 hours before opening packing to prevent condensation of humidity before connecting to mains power.

Minimum Clearances

Do not cover the grille or place the subwoofer so that there is less than 0.1 m (4 in) of free space in front of the grille. The space must be ventilated or sufficiently large to dissipate heat so that the ambient temperature does not rise above 35 degrees Celsius (95°F). Make sure that the space under the subwoofer allows air flow. Thick carpets may block ventilation needed for cooling the electronics. The reflex port opening should have a clearance of at least 7.5 cm (3 in) to ensure functioning of the reflex port.

Flush Mounting

When the subwoofer is flush mounted in a wall or cabinet, ensure unrestricted airflow in the reflex port and amplifier cooling.

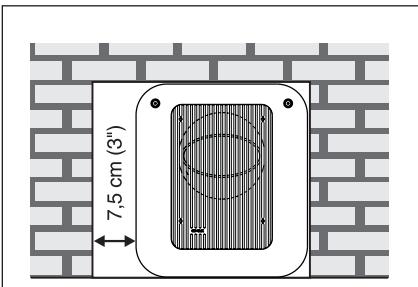


Figure 4. Flush mounting the subwoofer. Note the clearance needed on the reflex port side.

Make the recess 7.5 cm (3 in) wider than the subwoofer. Place the subwoofer to the right side of the recess if the driver is facing the room. This leaves sufficient free space at the reflex port side. The height and depth of the recess should not be much bigger than needed for ventilation as this may cause unwanted acoustic effects.

Using Multiple Subwoofers

Multiple Genelec 7360A or 7370A subwoofers can be coupled together in high SPL applications. The necessary cabling is different for digital and analog signals.

Digital Cabling

Run a signal cable from the AES/EBU OUT connector of the first subwoofer in the chain to the AES/EBU IN connector of the next subwoofer. Check that the Digital LFE and LFE Channel A/B control switches have the same settings in all subwoofers in the chain.

Analog Cabling

When daisy-chaining multiple subwoofers with analog signals, run a cable from the Link Out connector to the next subwoofer's Link In connector. When using the LFE signal, also run a cable from the LFE Out to the next subwoofer's LFE In.

Control Switch Settings

When Using Multiple Subwoofers

When using GLM and its AutoCal function for calibration, no manual adjustments on the control switches are necessary. If GLM is not available, manual adjustments are needed.

1. Calibrate the subwoofers one by one with all other subwoofers in the chain switched off. Start with the first subwoofer.

2. First calibrate the level between the subwoofer and all main monitors using the rotary level adjustment trimmer on the subwoofer and suitable test signals.

3. Adjust the phase of the first subwoofer as instructed in the chapter “Manual Phase Adjustment Method”.

4. Repeat phases 1 to 3 with all other subwoofers in the chain, one by one.

5. When two subwoofers connected in this way are positioned close to one another, bass level increases by 6 dB. Three subwoofers give an SPL increase of 9.5 dB and four subwoofers 12 dB compared to a single subwoofer. In order to match the SPL level of the complete subwoofer chain with the main monitor system, reduce the level of all subwoofers in the chain accordingly.

Maintenance

There are no user serviceable parts inside the subwoofer. Maintenance or repair must only be done by a Genelec certified service.

Guarantee

Genelec guarantees the subwoofers for two years against manufacturing faults or defects altering performance. Refer to the reseller for full sales and guarantee terms.

Safety Considerations

The 7360A and 7370A have been designed in accordance with international safety standards. To ensure safe operation, the following warnings and precautions must be observed:

- Servicing and adjustment must only be performed by a Genelec certified service.
- The subwoofer enclosure must not be opened.
- Do not use this product with a mains cable or mains outlet having no protective earth (potential equalizing) connection as doing so may result in personal injury.
- To prevent fire or electric shock, do not expose the product to water or moisture.
- Do not place objects filled with liquid, such as vases, on the subwoofer or near it.
- The amplifier is not completely disconnected from the mains power unless the mains cable is removed from the amplifier or the mains outlet.

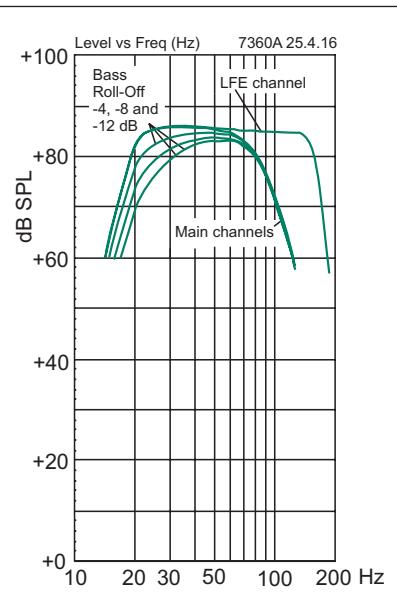


Figure 5. The curves above show the main channel's frequency response with 85 Hz lowpass filtering, the frequency response of the LFE channel and the effect of the Bass Roll-Off adjustment to the response of the 7360A.

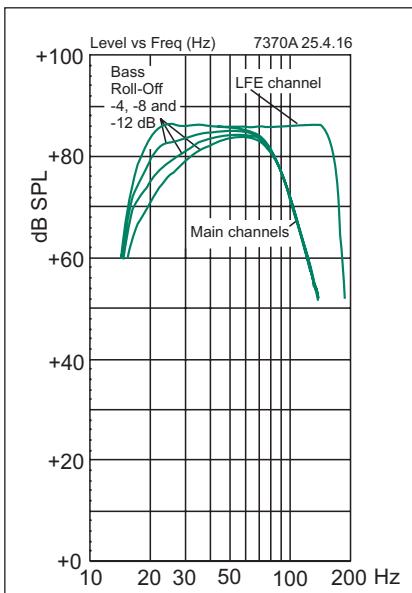


Figure 6. The curves above show the main channel's frequency response with 85 Hz lowpass filtering, the frequency response of the LFE channel and the effect of the Bass Roll-Off adjustment to the response of the 7370A.

- Free flow of air behind and around the subwoofer is necessary to maintain sufficient cooling. Do not obstruct airflow around the subwoofer.
- These subwoofers are capable of producing sound pressure levels in excess of 85 dB, which may cause a permanent hearing damage.

Compliance to FCC Rules

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the

instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment under FCC rules.

SPECIFICATIONS

Model	7360A	7370A
Lower cut-off frequency -6 dB	19 Hz	19 Hz
Upper cut-off frequency -6 dB (main channel/LFE)	100 Hz/150 Hz	100 Hz/150 Hz
Driver	250 mm (10 in) (magnetically shielded)	305 mm (12 in) (no magnetical shielding)
Harmonic distortion at 1 m on axis in half space, 30 to 85 Hz	2nd ≤ 3% @ 90 dB SPL 3rd ≤ 2% @ 90 dB SPL	2nd ≤ 3% @ 95 dB SPL 3rd ≤ 3% @ 95 dB SPL
Maximum short term sine wave SPL output averaged from 30 to 85 Hz, measured in half space at 1 meter	≥ 109 dB SPL	≥ 113 dB SPL
Maximum peak SPL output with random pink noise, measured in half space at 1 meter	≥ 114 dB SPL	≥ 118 dB SPL
Self generated noise at 1 m on axis (A-weighted)	< 5 dB	
Weight	27 kg	48 kg
Dimensions H x W x D	527 x 462 x 365 mm 20 ³ / ₄ x 18 ³ / ₁₆ x 14 ³ / ₈ in	625 x 555 x 496 mm 24 ⁵ / ₈ x 21 ⁷ / ₈ x 19 ¹ / ₂ in

AMPLIFIER SECTION

Short term amplifier output power (Long term output power is limited by driver unit protection circuitry)	300W	400W
Amplifier system THD at nominal output	≤ 0.01%	
Mains voltage	100-240 VAC 50/60 Hz	
Power consumption Standby, ISS active Idle Full output, peak	<1 W 15 W 300 W	<1 W 20 W 400 W

SIGNAL PROCESSING SECTION

Analog signal input connector XLR female, balanced 10 kOhm	pin 1 gnd, pin 2 non-inverting, pin 3 inverting
Maximum analog input signal Analog input sensitivity (100 dB SPL at 1 m) rotary level adjustment	+25.0 dBu +12 to -6 dBu
Digital signal input connector XLR female 110 Ohm Digital signal output / Thru connector XLR male 110 Ohm	AES/EBU Single Wire AES/EBU Single Wire
Digital audio input Word length Sample rate Digital input sensitivity(100 dB SPL at 1 m) rotary level adjustment	16 - 24 bits 32 - 192 kHz -30 dBFS
Subsonic filter (18 dB/octave) below	19 Hz
Control network Type Connection	Proprietary GLM™ network 2 RJ45, CAT5 cables
GLM™ software frequency response adjustment parametric notch filters	20
System calibration	Genelec GLM AutoCal™
Crossover subwoofer/subwoofer output channels Centralized Bass Management Distributed Bass Management (GLM control only)	Subwoofer: low pass 85 Hz, output: high pass 85 Hz Subwoofer: low pass 50-100 Hz, output: no filtering
LFE cutoff	150 Hz
Midband rejection >400 Hz	≥ 50 dB
Bass Roll-Off control operating range in 4 dB steps	0 to -12 dB at 20 Hz
Phase matching control	90° steps with dip switch controls 15° steps with GLM control

7360A and 7370A Operating Manual

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真力 7360A and 7370A 智能有源超低音箱

介绍

感谢您选择 Genelec 真力 7300 系列超低音箱。本手册将为您介绍真力 7360A 和 7370A 的设置和使用方法。这两款超低音箱可以轻松集成到所有专业场合中，支持模拟输入和 AES/EBU 格式数字输入，专为模拟多声道系统和数字 AES/EBU 立体声系统的精准监听而设计。如需对数字多声道系统进行低频管理，可通过真力 9301 多通道数字音频接口将信号接入超低音箱。

智能休眠功能 (ISS™) 启用后，当音箱在一段时间内未检测到输入信号时，将自动进入待机模式，此模式下消耗的功率小于 1 瓦。当检测到输入信号时，音箱将自动回到工作状态。可通过 GLM™ 软件调整进入待机模式的等待时间。当启用 ISS 功能时，您的音箱既能够节能环保，又能够随时待命。

安装

每只超低音箱配备 1 根电源线，1 根长度 5 米的 GLM 网线，以及此操作手册。在连接信号线之前，请确保音箱处于关闭状态。

接口

模拟输入通道 1-7

这些卡侬 (XLR) 平衡输入接口通常与调音台或监听控制器的输出相连。最大输入电平为 +24 dBu。多声道低频管理的数字信号可以通过真力 9301 音频接口接入超低音箱。

模拟 LFE 输入

这个接口是 LFE 声道信号的专用输入接口。通道的截止频率上限到 150 Hz。通过打开音箱接口面板上的“LFE +10 dB”拨档开关，可额外提升电平 10 dB。

模拟环出通道 1-7

这些卡侬 (XLR) 平衡环出接口用于超低音箱与全频音箱之间的连接。根据低频管理部分的设置情况，环出接口会将未经任何处理或经过高通滤波的信号传输至全频音箱。详情请参阅“低频管理”章节。

模拟 LFE 环出

这个接口将 LFE 声道信号直通输出。当以菊花链方式连接多只超低音箱时，LFE 声道信号通过上一只音箱的该环出接口传输到下一只音箱的模拟 LFE 输入。

串接环出

模拟输入通道 1-7 的信号总和。当以菊花链方式连接多只超低音箱时，通过这个接口将低频管理的信号传输到其他超低音箱。详情请参阅“使用多只超低音箱”章节。

串接输入

以菊花链的方式连接多只超低音箱时，串接输入接口用于接收来自上一只音箱串接环出接口的信号。串接输入接口被使用后，请勿再使用此音箱上的模拟输入通道 1-7 接口。详情请参阅“使用多只超低音箱”章节。

输出 1 / 测试 1

在单机模式下（脱离 GLM 软件使用），从这个接口输出相位校准所需的 85 Hz 测试信号。通过打开“测试信号 (Test Tone)”拨档开关输出测试信号。

输出 2 / 测试 2

为后续功能预留。

AES/EBU 输入

支持两通道 AES/EBU 数字输入。可以通过 GLM 软件或使用“数字 LFE (Digital LFE)”和“数字 LFE 通道定义 (LFE Channel A/B)”拨档开关将这个输入接口配置为数字 LFE 输入通道。

AES/EBU 环出

将 AES/EBU 输入接口的数字信号从这个接口直通输出。

旁通

低频管理功能的旁通开关。在单机模式下，可连接 6.3 毫米规格的大三芯 (TRS) 或大二芯 (TS) 插头，通过断开/连通插头的触点来控制低频管理功能的打开或关闭。

GLM 控制网络

运行 GLM 软件的电脑通过适配盒连接到这个 CAT 5 网络接口 (RJ45) 对音箱进行控制。

电源输入

电源输入支持全球通用电压 (100-240 伏交流电, 50-60Hz)，可以用于不同电源规格的环境。当使用发电机、逆变器或低质量 UPS 等设备供电时，我们建议使用额外的设备来滤除电源杂波，并确保电压供应稳定。

低频管理

低频管理的主要功能是将输入信号按照所设置的分频点拆分为低频部分和高频部分。低于分频点的信号由超低音箱重放，高于分频点的信号由与超低音箱模拟环出接口相连的全频音箱重放。

7360A 和 7370A 支持两种低频管理模式：

集中式低频管理

采用集中式低频管理模式时，超低音箱中的高通滤波器和低通滤波器将都被启用。无论是否使用 GLM 软件，都可以采用此低频管理模式。模拟输入通道的 85 Hz 固定分频器默认在单机模式下被启用。但我们建议您采用更加灵活的分布式低频管理模式。

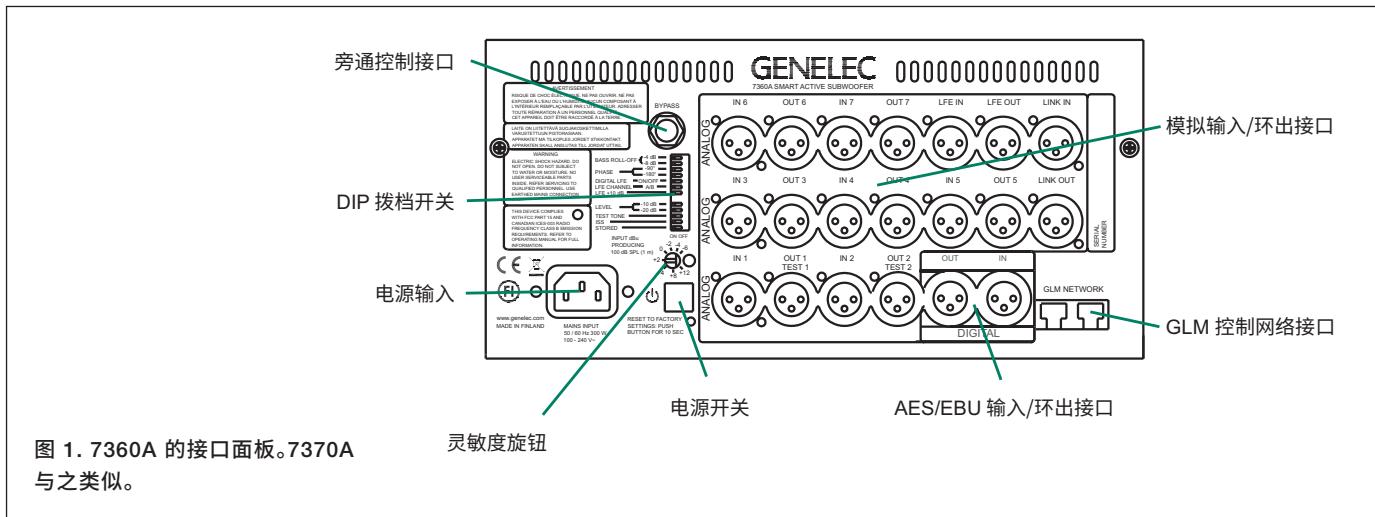
在集中式低频管理模式下，从音源输出的所有模拟线缆先连接到超低音箱的模拟输入接口，再由音箱的模拟环出接口连接至对应的全频音箱。

分布式低频管理

采用分布式低频管理模式时，超低音箱中的低通滤波器和全频音箱中的高通滤波器将被启用，在 GLM 软件中，用户可以协同设置全频音箱和超低音箱的分频滤波器。此模式仅适用于真力 SAM 系列音箱（个别型号不支持），且需要搭配真力 GLM 用户套件使用。

使用分布式低频管理时，可通过 GLM 软件调节分频点，分频点的范围为 50 Hz 至 100 Hz。

分布式低频管理模式支持三种不同的信号连接方式：



- 从音源输出的所有通道，需要先连接至超低音箱的输入接口，再由环出接口连接至对应的全频音箱。
- 使用一分二线缆，从音源设备输出分别连接至超低音箱和全频音箱。
- 每个通道占用音源设备的两个输出接口，分别连接至超低音箱和全频音箱。

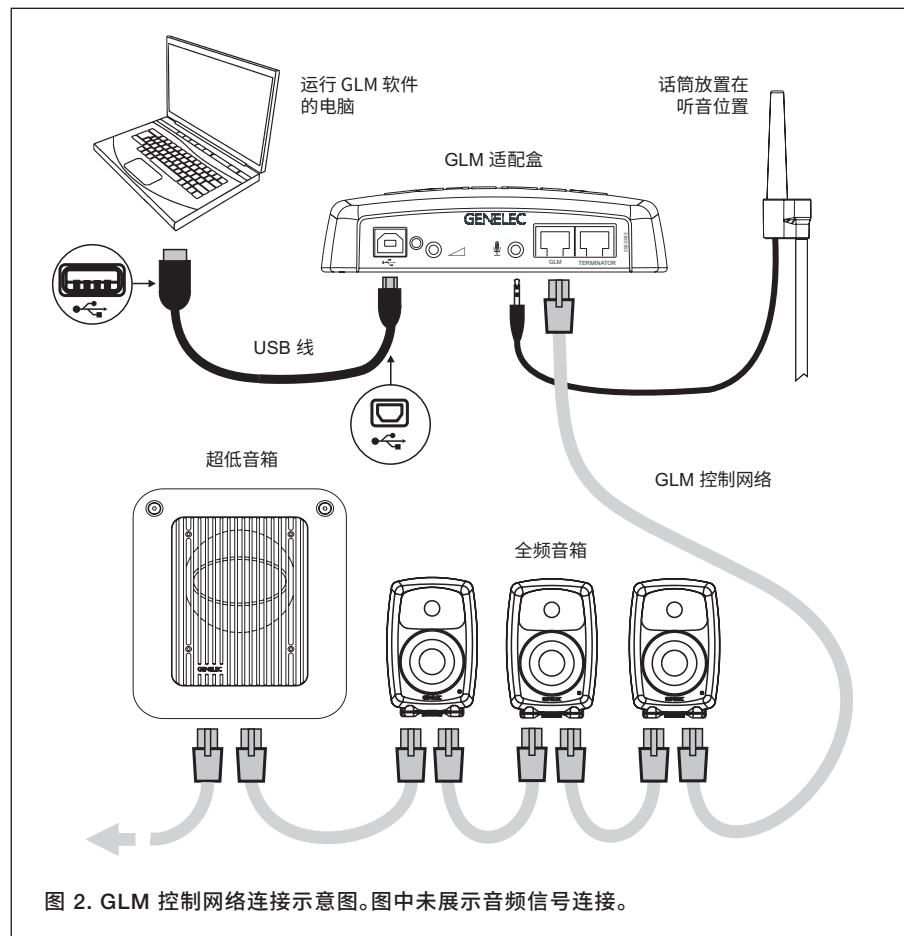
使用 GLM 进行音箱设置

7360A 和 7370A 与真力音箱管理软件 (GLM)、专有的真力控制网络，以及其他 SAM™ 系列音箱完美兼容。配合 GLM 软件使用时，7360A 和 7370A 才能启用 20 段参量均衡，发挥其房间声学补偿的全部性能。有关 GLM 控制网络使用的详情，请参阅《GLM 使用手册》。

系统设置

尽管 7360A 和 7370A 可以脱离 GLM 软件进行使用，但仅有经过 GLM 软件设置和校准后，才能发挥出其最佳性能。从简单的立体声系统到复杂的 3D 沉浸式系统，从仅使用一只超低音箱到使用多只超低音箱，真力 GLM 软件能为任何重放系统提供自动声学校准。GLM 软件使用便捷且结果准确，它可以精准地测量分析出房间内常有的低频模态共振和由于声波反射造成的特定频段能量过多现象，并精准地进行补偿。相关设置可以通过电脑控制，也可以存储到音箱中，无需随时在电脑上运行 GLM 软件。真力建议使用 GLM 软件设置 SAM 系列音箱。有关 GLM 软件使用的详细说明请见《GLM 使用手册》。

GLM 使用便捷，包括以下步骤：



1. 使用 5 类网线 (RJ45) 将每只音箱（包括超低音箱）串接起来，最终连接到 GLM 适配盒（见图1）；
2. 通过 USB 线将 GLM 适配盒连接到电脑；
3. GLM 用户套件中包含一支校准话筒。使用话筒支架，将真力校准话筒置于听音位
- 置。校准话筒指向正上方，话筒顶部与听音者耳朵齐平；
4. 将话筒连接到 GLM 适配盒的话筒输入接口；
5. 从真力官方网站 (www.genelec.cn 的“服务支持 > GLM 软件下载”页面) 下载最新的 GLM 软件；

6. 安装最新的 GLM 软件, 根据软件提示进行音箱设置和校准;
7. 如果您不需要随时在电脑上运行 GLM 软件来控制音箱, 可以将 GLM 设置存储到音箱中(利用菜单选项中的“编组预设 (Group Preset) > 保存到音箱 (Store to Loudspeakers) ”)。

使用 GLM 软件将声学设置保存到音箱。当断开 GLM 控制网络后, 您需要将音箱背板上的“保存 (Stored)”拨档开关拨至“ON”, 来启用存储在音箱内的声学设置。

当使用 GLM 软件控制音箱时, 当前的信号输入模式完全由 GLM 软件控制。可在“编组预设 (Group Preset) > 编辑 (Edit) > 输入模式 (Input Mode)”中选择模拟或数字。

在单机模式(脱离 GLM 软件使用)下, 当检测到 AES/EBU 数字信号时钟时, 音箱将强制切换为数字输入。

将校准后的声学设置保存到音箱并启用后, 在保存界面中的输入选择将作为音箱当前的输入模式。

脱离 GLM 进行音箱设置

连接

7300 系列超低音箱可以轻松设置其固定模拟分频器(85 Hz)。在出厂时, 此分频器默认为启用状态(此时音箱处于集中式低频管理模式), 音箱上所有模拟环出接口的信号都会经过此分频器进行高通滤波。在当前模式下, 请将每根信号线先连接至超低音箱, 再由其对应的输出连接至各只全频音箱。全频音箱接收到的信号将经过高通滤波, 只包含 85 Hz 以上部分。

当系统中包含 LFE 声道时, 将 LFE 声道信号接入超低音箱的模拟 LFE 输入(LFE IN)接口。

拨档开关

低频滚降 (BASS ROLL-OFF) 控制用于补偿超低频率的隆起, 以 4 dB 为步长衰减 20 Hz 附近的电平, 同时打开两个开关则共计衰减 12 dB。将两个开关都拨至“OFF”时, 可在无反射的消声室中获得平直的响应。

相位 (PHASE) 开关可调节超低音箱的相位, 使其与选定的全频音箱相位耦合。相位不一致会导致分频点附近频率的电平产生衰减。详情请参阅“相位”章节。

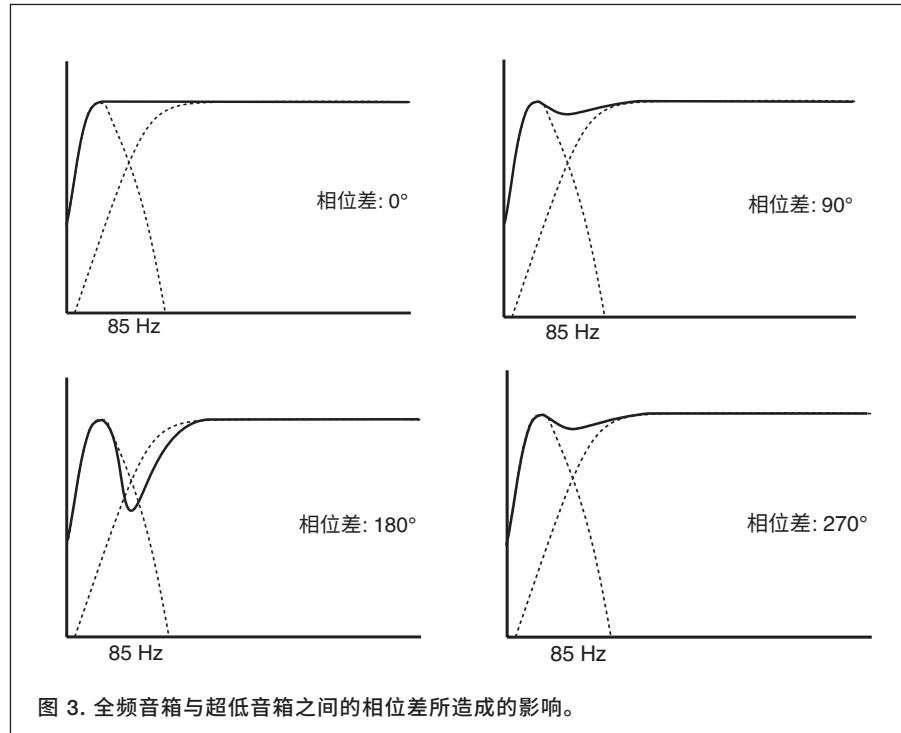


图 3. 全频音箱与超低音箱之间的相位差所造成的影响。

数字 LFE (DIGITAL LFE) 开关可将 AES/EBU 数字输入 (DIGITAL IN) 其中一个通道调整为数字 LFE 输入通道, 并将所选通道的低通滤波器设置为 150 Hz(参阅下方“数字 LFE 通道定义”)。

数字 LFE 通道定义 (LFE CHANNEL A/B)

开关用于选择 AES/EBU 数字输入的 A 或者 B 通道传输 LFE 声道信号, 将开关拨至“ON”时, 选择 A 通道, 拨至“OFF”时, 选择 B 通道。如果选择 A 通道作为 LFE 通道, 则 B 通道将承载主声道信号, 反之亦然。

LFE +10 dB 开关用于将 LFE 声道信号电平增加 10 dB。详情请参阅“使用 LFE +10 dB 功能”章节。

电平 (LEVEL) 开关用于线性衰减超低音箱的输出电平, 此开关与灵敏度旋钮可叠加使用。

测试信号 (TEST TONE) 开关用于打开手动校准相位所需的 85 Hz 测试信号, 详情请参阅“手动校准相位”章节。

智能休眠 (ISS) 开关用于开启 ISS 智能休眠功能。

保存 (STORED) 开关用于选择启用储存在音箱内的配置或者启动音箱背板上物理开关的设置。储存在音箱内的配置需要通过 GLM 软件进行设置, 相比物理开关能提供更丰富的功能。

接口面板指示灯

音箱接口面板指示灯通常为绿色, 表示音箱处于正常工作状态。当功放过载时, 指示灯会变为红色; 当音箱内部温度过高时, 指示灯会变为黄色。如果指示灯变成红色或黄色时, 请降低电平。

相位

全频音箱与超低音箱之间相位未对齐, 会导致系统频率响应在分频点附近下降。图 3 展示了不同相位差对频率响应的影响。

全频音箱与超低音箱的相位耦合取决于听音位置以及超低音箱和全频音箱在房间中的摆位。因此, 请先在房间中为音箱找到合适的位置, 并匹配全频音箱与超低音箱之间的电平, 然后再进行相位调节。GLM 软件可以进行自动相位校准。如果 GLM 软件不可用, 则可以根据以下方法手动校准相位。

手动校准相位

真力 7360A 和 7370A 超低音箱内置了手动校准相位时所需的 85 Hz 测试信号。信号发生器会将信号传输至“测试 1 (TEST 1)”输出接口。临时将全频音箱连接至此接口进行相位校准。

打开系统并将“测试信号 (TEST TONE)”拨

挡开关拨至“ON”。此时,可以听到超低音箱和全频音箱同时重放 85 Hz 测试信号。

- 将 -180° 相位开关分别拨至“ON”和“OFF”进行聆听,并将开关拨至在听音位置上获得最低声压级的档位上。
- 将 -90° 相位开关分别拨至“ON”和“OFF”进行聆听,并将开关拨至在听音位置上获得最低声压级的档位上。
- 最后,将 -180° 相位开关拨至相反位置,并断开测试信号。相位校准完成。

使用 LFE +10 dB 功能

杜比数字和 DTS 编码格式的 LFE 声道相对于主声道需要有额外的 10 dB 增益补偿,多数环绕声解码器会自动在 LFE 声道增加 10 dB,以恢复电平平衡。

“LFE +10 dB”功能可以为制作系统中的 LFE 声道增加 10 dB。如果系统链路中除音箱之外的设备无法为 LFE 声道增加 10dB,将“LFE +10 dB”拨档开关拨至“ON”以启用该功能。如果 LFE 声道的输出电平已经比其它(非 LFE 声道)声道高 10 dB,此开关应拨至“OFF”。

在以下情况下,请勿使用“LFE +10 dB”功能:

- 在其他设备中已为 LFE 声道增加 10 dB,例如环绕声处理器或者调音台的输出矩阵。
- 制作的音频格式无需在 LFE 声道上增加 10 dB。

附加内容

音箱在房间中的摆位

超低音箱在房间中的摆位显著影响频率响应和声压级。房间声学对低频的影响极其强烈,即使音箱位置只发生细微变化,也会引起频率响应上的显著差异。

将超低音箱摆放在靠近房间前墙的地板上,略微偏离房间左右的中轴线。通常需要系统的试验才能找到理想的位置,使超低音箱的频率响应更加平直。为获得最大的输出,通常会将超低音箱靠近墙面摆放。超低音箱靠近角落摆放,也会让低频能量显著增加,但可能会导致低频声像不对称。超低音箱的单元到前墙的距离应小于 0.6 米(24 英寸),避免因墙面反射声引

发部分低频产生抵消现象。

使用环境

此产品仅限室内使用。允许的环境温度为 15-35°C (50-95°F), 相对湿度为 20% 至 80% (未凝结)。为了防止冷凝, 当此产品从温度较低的储存或运输环境转移至温暖的环境中时, 请静候至少 0.5-1 小时后再通电开机使用。

与墙面或其他物体之间的最小距离

请勿遮盖音箱格栅, 并在音箱格栅前方留出不小于 0.1 米(4 英寸)的开放空间。空间须保持通风, 或留有足够的空间以供散热, 确保环境温度不会超过 35 摄氏度(95 华氏度)。请确保超低音箱下方的空间允许空气流通。厚重的地毯可能会阻碍通风, 导致影响功放散热。为确保超低音箱的倒相孔正常工作, 请在箱体的倒相孔一侧留出不小于 7.5 厘米(3 英寸)的空隙。

嵌入式安装

当把超低音箱嵌入墙体或柜体安装时, 请为功放留出足够的散热空间, 并确保倒相孔附近空气正常流通。嵌入槽的宽度需比音箱宽度多 7.5 厘米(3 英寸)。请注意正确的安装方向, 音箱单元面向房间内部, 并在嵌入槽中靠右放置, 以便为倒相孔留出足够空间。请确保音箱四周有足够的空间用于通风, 但嵌入槽的高度和深度不应远大于音箱的尺寸, 这可能会导致有害的声学现象, 影响声音效果。

使用多只超低音箱

多只 7360A 或 7370A 可串接使用, 以获得更大的声压级。数字系统和模拟系统的连接方式有所不同。

数字信号连接

将链路中第一只超低音箱的 AES/EBU 环出 (DIGITAL OUT) 接口通过信号线连接至下一只超低音箱的 AES/EBU 输入 (DIGITAL IN) 接口。请确保音箱系统中每只超低音箱的“数字 LFE”拨档开关和“数字 LFE 通道定义”拨档开关设置相同。

模拟信号连接

以菊花链形式连接多只超低音箱并传输模拟音频信号时, 将第一只超低音箱的串接环出 (LINK OUT) 接口通过信号线连接至下一只超低音箱的串接输入 (LINK IN) 接口; 当

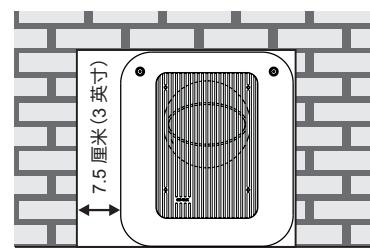


图 4. 超低音箱嵌入式安装。请注意倒相孔一侧需预留的空隙。

系统中包含 LFE 声道信号时, 将第一只超低音箱的模拟 LFE 环出 (LFE OUT) 接口通过信号线连接至下一只超低音箱的模拟 LFE 输入 (LFE IN) 接口。

脱离 GLM 使用多只超低音箱

我们建议使用 GLM 软件对超低音箱进行校准, 而无需手动调节音箱上的物理开关。如果无法使用 GLM 软件, 可以按照以下步骤进行手动校准:

1. 关闭链路中其他超低音箱, 对所有超低音箱逐只进行校准。
2. 使用合适的测试信号, 通过旋转超低音箱上的灵敏度旋钮来调节超低音箱的电平, 使其匹配所有全频音箱。
3. 按照“手动校准相位”章节中的说明, 校准第一只超低音箱的相位。
4. 按照上述步骤 1-3, 逐只校准系统中其他超低音箱。
5. 当两只超低音箱以上述的方式连接并紧靠摆放时, 声压级会增加 6 dB。相较于单只音箱, 三只音箱的总声压级会增加 9.5 dB, 而四只音箱会增加 12 dB。为了使得整个超低系统与主音箱的声压级匹配, 请相应降低每只超低音箱的电平。

维护

在音箱内部没有任何用户可自行维护的部分。任何关于音箱的维护或维修都应由真力授权的维修服务人员来完成。

质保

产品针对材料和工艺上的质量问题提供 2 年的质保服务。通过扫描包装箱上的二维码注册您的音箱，可将质保期延长至 5 年。详细质保条款可在 www.genelec.cn 的“服务支持 > 维修与延保服务”页面查看。

安全注意事项

7360A 和 7370A 严格按照国际安全标准设计，但您仍需注意以下警告和注意事项，确保安全操作：

- 任何关于音箱的维护或维修都应由真力授权的维修服务人员来完成。
- 切勿自行拆开音箱。
- 切勿使用未连接保护地的电源，这可能会危及人身安全。
- 切勿将音箱暴露在水中或潮湿环境，这可能会导致火灾或触电。
- 切勿在音箱上或其附近摆放装有液体的物品，例如花瓶。
- 本设备采用电源插头作为断开装置。除非将电源线从音箱上或电源插座上拔掉，否则设备并未完全与交流电源断开连接。
- 切勿阻挡音箱周围的气流。确保音箱后方有足够的空气流动，使音箱能够充分冷却。
- 音箱可以产生超过 85dB 的声压级，这可能会引起永久性听力损伤。

FCC 符合性声明

该设备符合 FCC 标准第 15 部分的要求。操作必须符合以下两个条件：

- (1) 此设备不造成有害干扰
- (2) 设备必须接收所收到的干扰，包括可能导致意外操作的干扰

注意：该设备已经过测试，符合 B 类数字设备的限制，且符合 FCC 标准第 15 部分的要求。这些限制旨在提供合理的保护，防止在住宅区安装时产生有害干扰。该设备会产生、使用并辐射射频能量，如果未按照说明安装和使用，则可能对无线通信造成有害干扰。但是，我们无法保证在特定安装中不产生干扰。如果设备

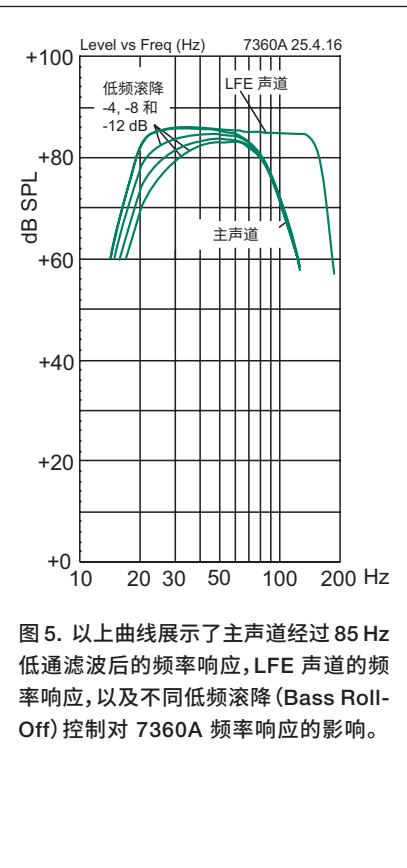


图 5. 以上曲线展示了主声道经过 85 Hz 低通滤波后的频率响应，LFE 声道的频率响应，以及不同低频滚降 (Bass Roll-Off) 控制对 7360A 频率响应的影响。

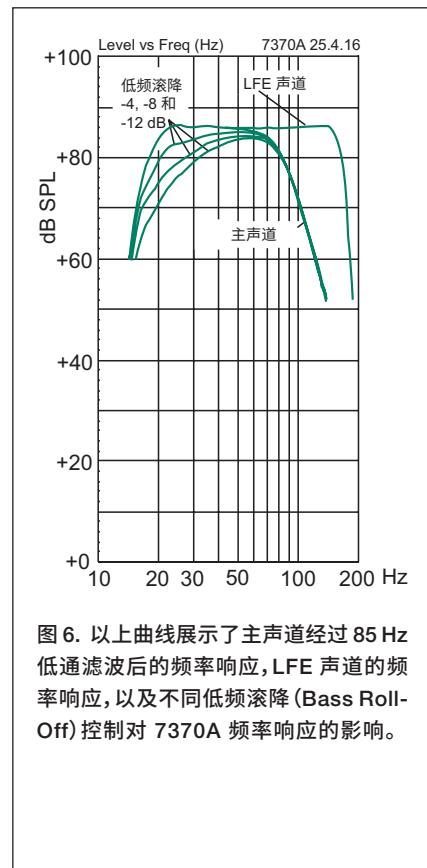


图 6. 以上曲线展示了主声道经过 85 Hz 低通滤波后的频率响应，LFE 声道的频率响应，以及不同低频滚降 (Bass Roll-Off) 控制对 7370A 频率响应的影响。

对无线电和电视的接收产生有害的干扰，用户可通过开关该设备进行验证，我们建议用户采用下述一种或多种手段消除干扰：

- 重新调整天线的方向和位置。
- 增加该设备与接收器之间的距离。
- 将该设备和接收器分别连接到不同电路的插座上。
- 向经销商或有经验的无线电/电视技术人员寻求帮助。

任何未经制造商许可的改动都将让用户丧失在 FCC 规定下操作设备的权力。

	7360A	7370A
低频截止频率 -6 dB	19 Hz	19 Hz
高频截止频率 -6 dB (主通道/LFE 通道)	100 Hz/150 Hz	100 Hz/150 Hz
频率响应精确度 ±3 dB	19 Hz - 100 Hz	19 Hz - 100 Hz
驱动单元	250 毫米 (10 英寸) (磁屏蔽)	305 毫米 (12 英寸) (无磁屏蔽)
半开放空间内, 总谐波失真 @1米 轴上 30 Hz - 85 Hz	2nd ≤ 3% @ 90 dB SPL 3rd ≤ 2% @ 90 dB SPL	2nd ≤ 3% @ 95 dB SPL 3rd ≤ 3% @ 95 dB SPL
半开放空间内, 轴上最大短时正弦波声学输出, 30 Hz - 85 Hz 均值 @1 米	≥ 109 dB SPL	≥ 113 dB SPL
半开放空间内, 使用随机粉噪测得的最大峰值声学输出 @1 米	≥ 114 dB SPL	≥ 118 dB SPL
自身噪声电平 @ 1米 轴上 (A计权)	< 5 dB	
重量	27 千克	48 千克
尺寸 高度 x 宽度 x 深度	527 x 462 x 365 毫米 20 ³ / ₄ x 18 ³ / ₁₆ x 14 ³ / ₈ 英寸	625 x 555 x 496 毫米 24 ⁵ / ₈ x 21 ⁷ / ₈ x 19 ¹ / ₂ 英寸

功放短期输出功率 (长期输出功率受限于驱动单元保护电路)	300 瓦	400 瓦
在标称输出功率下功放系统失真参数	≤ 0.01%	
电源电压	100-240 伏交流电 50/60 Hz	
功耗 待机 (ISS) 空闲 满输出	<1 瓦 15 瓦 300 瓦	<1 瓦 20 瓦 400 瓦

模拟信号输入接口:卡侬 (XLR) 母座 (平衡式 10k 欧姆)	针脚 1 :地; 针脚 2 :正极; 针脚 3 :负极
最大模拟信号输入电平 使用灵敏度旋钮时, 模拟输入灵敏度(100 dB SPL @1 米)	+25.0 dBu +12 dBu 到 -6 dBu
数字信号输入接口:卡侬 (XLR) 母座 (110 欧姆) 数字信号输出 / 环出接口:卡侬 (XLR) 公座 (110 欧姆)	AES/EBU 单线 AES/EBU 单线
数字信号输入 量化精度 采样范围 使用灵敏度旋钮时, 数字输入灵敏度(100 dB SPL @1 米)	16 - 24 bits 32 - 192 kHz -30 dBFS
超低频滤波器 (18 dB/倍频程) 低于	19 Hz
控制网络 类型 连接方式	专有的 GLM 控制网络 2 个 RJ45 接口, 5 类网线
GLM™ 软件频率响应调整参量陷波滤波器	20 段
系统校准	使用真力 GLM 软件进行自动或手动校准, 也可使用音箱接口面板上的拨档开关
超低音箱和超低音箱环出通道的分频设置 集中式低频管理 分布式低频管理 (仅支持在 GLM 软件中调节)	输入: 低通 85 Hz, 环出: 高通 85 Hz 输入: 低通 50-100 Hz, 环出: 无滤波器
LFE 通道截止频率	150 Hz
中频抑制 > 400 Hz	≥ 50 dB
低频滚降控制调节范围 (以 -4 dB 为步长)	0 — -12 dB, @ 20 Hz
相位耦合控制	拨档开关以 90° 为步长 GLM 软件以 15° 为步长

真力 7360A 和 7370A 智能有源超低音箱