

# 7300 Series

Operating Manual 操作手册

Genelec 7380A Smart Active Subwoofer

真力 7380A 智能有源超低音箱

**GENELEC®**



# Genelec 7380A Smart Active Subwoofer

## Introduction

Thank you for choosing a Genelec product! Fulfilling our customers' dreams by offering people the most truthful sound reproduction possible has been the source of our enthusiasm since 1978. There's already over one million Genelec monitors around the world - welcome to our story!

All Genelec monitors are designed, hand assembled and individually tested at our factory in Iisalmi, Finland. Our products are designed to last for decades and we take care that our customers receive excellent support and technical services throughout the lifetime of the products.

Please register your monitor at <http://www.community.genelec.com/>. You will receive an extended 5 year warranty for spare parts. More information about our service and technical support: <http://www.genelec.com/customer-service>.

## System Description

The Genelec 7380A SAM subwoofer integrates easily into environments based on analog or digital interfacing. The 7380A even introduces outstanding GLM™ features to the lower octaves of monitoring systems based on main speakers from a different vendor.

The 7380A is designed for precise monitoring of multichannel analog audio signals and stereo AES/EBU signals. Multichannel AES/EBU signals can be monitored by using the 9301A multichannel digital audio interface device connected to the subwoofer.

The subwoofer can be fully set up using the controls built into the unit. The 7380A can also be precisely calibrated to the monitoring room acoustics using the Genelec Loudspeaker Manager (GLM) computer software. The GLM software runs on Mac OS and Windows computers and enables detailed acoustic calibration permanently inside the subwoofer. It is also possible to use the GLM software as a monitoring management system for more than 30 SAM monitors and subwoofers.

In its power save mode, the 7380A consumes less than 2 W of power. Energy saving Intelligent Signal Sensing (ISS) can automatically put the subwoofer into a power save mode when audio has been absent for a selected time. Upon sensing an input signal, the subwoofer wakes up to full operation. The time before entering the ISS power save mode can be configured using

the GLM software. When the ISS is active you can have your monitoring system ready for action at all times.

## Package content

Each subwoofer is supplied with a mains cable, one 5 m GLM network cable and an operating manual.

### Genelec Loudspeaker Manager™ (GLM™) Software And GLM User Kit

The GLM software gets the most out of 7380A and tailor-fits it to your room. GLM is available for download free of charge at [www.genelec.com/glm](http://www.genelec.com/glm). Check in from time to time to take advantage of new features, or consider using the cloud-based version.

A GLM User Kit comprising the necessary hardware, including the GLM Adapter and measuring microphone is needed for building and operating the GLM network. This kit can be purchased at certified Genelec dealers.

## Connections

Before connecting signal cables, switch the subwoofer and monitors off.

### Analog inputs 1 to 7

The 7380A SAM subwoofer accepts balanced XLR inputs. These are the outputs typically provided in a console or a monitor controller. The maximum balanced audio signal level is +24 dBu.

### LFE In

A dedicated XLR input is provided for the analog LFE signal. The bandwidth for a signal fed to the LFE input is 120 Hz. The LFE input sensitivity can be set the same as for the main channels or at +10 dB relative to the main channels. This feature is set using the +10 dB DIP Switch or in the GLM software.

### AES/EBU input

One AES/EBU digital audio XLR input is available on the 7380A subwoofer. This can take a stereo digital audio signal.

Multichannel digital audio monitoring is possible with the 9301A interface device. The 9301A connects to the digital audio input in the 7380A subwoofer and expands the number of digital audio inputs to four XLR digital audio inputs. This supports a 7.1 audio system, including an LFE channel.

## Analog Output 1 to 7

Analog balanced XLR connectors connect the subwoofer to monitors.

The 7380A SAM subwoofer supports two bass management methods. Depending on the chosen bass management method, these analog outputs carry either unfiltered copy of the inputs (SAM distributed crossover) or a high-pass filtered signal (fixed crossover).

The fixed crossover is set to 85 Hz. The SAM distributed crossover method allows the subwoofer crossover to be adjusted in the GLM software from 50 Hz to 100 Hz.

See chapter "Bass Management" for details.

### LFE Out

The analog LFE Out is a copy of the signal at the analog LFE In. Typically, the LFE Out is used in connecting to the LFE In of the next subwoofer when multiple subwoofers are used together.

### Link Out

The sum of the analog inputs 1 to 7 is available at the analog Link Out. The Link Out is used in connecting to the next subwoofer when subwoofers are used together while using analog signals. See chapter "Using Multiple Subwoofers."

### Link In

The analog Link In accepts the signal from the analog Link Out. The Link In input is used when multiple subwoofers are used together while using analog signals. When the Link In is connected, the analog inputs 1 to 7 should not be connected.

See chapter "Using Multiple Subwoofers."

### OUT1 / Test 1

The analog OUT1 / Test 1 output XLR passes a test tone for aligning the phase of the subwoofer with a monitor.

This test tone has a frequency of 85 Hz when the 7380A SAM subwoofer is set up using the controls built into the subwoofer. The test tone is enabled with the DIP Switch labeled Test Tone. For more details on the use of this output, see the section 'Manual Phase Alignment Method'.

### OUT2 / Test 2

This analog output XLR is reserved for future use.

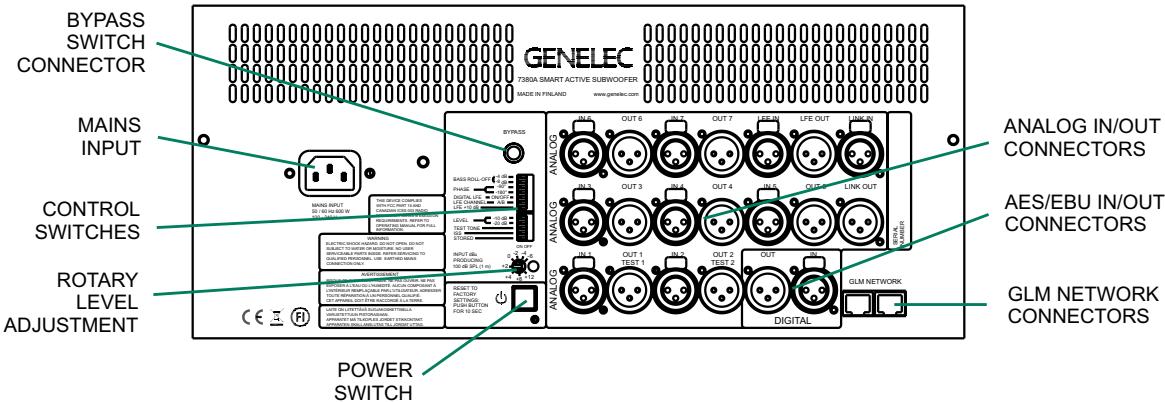


Figure 1. Connector panel of the 7380A.

### AES/EBU Out

The AES/EBU Out is a bit-to-bit copy of the digital audio signal on the AES/EBU IN. This output can be used for digital sharing of the audio between subwoofers in the case where multiple subwoofers are used. This output can also be used for distributing a stereo digital audio signal to monitors. This can create a 2.1 digital audio stereo monitoring system.

### Bypass

The Bypass input accepts a 6.3 mm tip-ring-sleeve (TRS) or tip-sleeve (TS) plug. This plug supports a contact open/close switch device. Connecting the TIP to the SLEEVE activates the bass management bypass. When the bass management bypass is active, the subwoofer only reproduces the LFE signal and the outputs bypassed to the monitors are exact copies of the inputs.

The Bypass switch is intended to be used when the subwoofer is set up using the controls built in the subwoofer.

The GLM software control enables also bypassing the bass management and offers a wider set of controls and adjustments. When the GLM is used, the TRS bypass control is not needed.

### GLM Management Network

All controls and calibration features included in the 7380A SAM subwoofer can be set using the Genelec Loudspeaker Manager (GLM) software. Two GLM Network connectors are provided on the subwoofer for computer control. These connectors accept CAT5 or higher cable (RJ45 connector). Standard CAT cables can be used.

The GLM management network runs a proprietary protocol. This is not an Ethernet connection, do not connect to an Ethernet network.

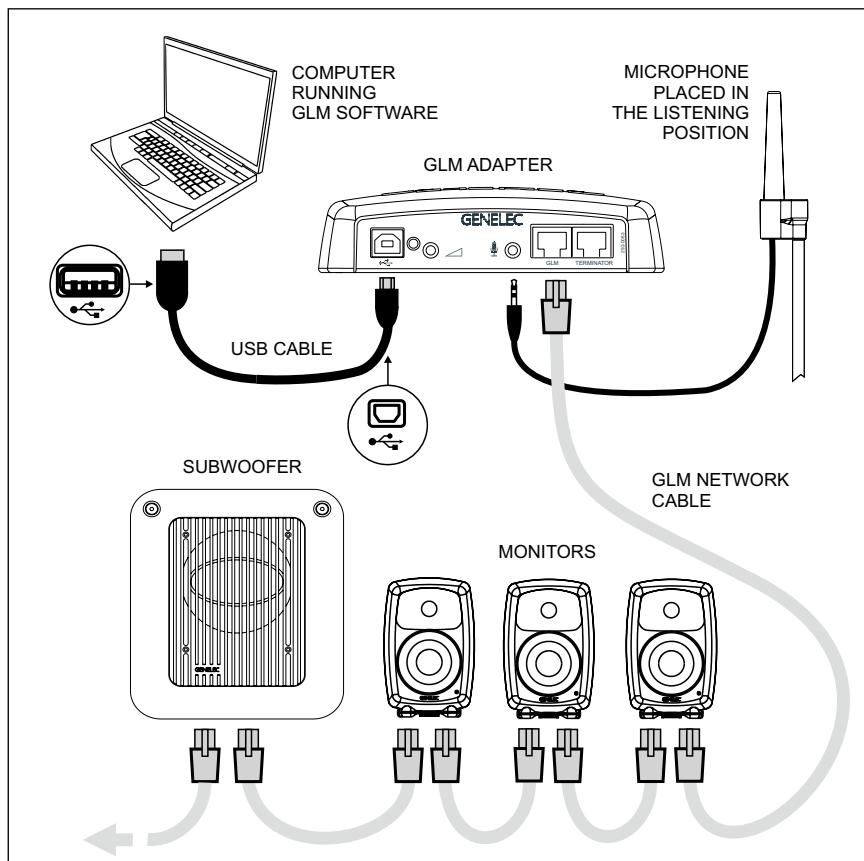


Figure 2. GLM Network cabling. Audio cabling not shown.

### Mains Power Input

The main power connection supports a wide mains voltage range (100-240 VAC, 50-60 Hz). This enables the 7380A SAM subwoofer to be plugged in anywhere globally. When the mains power is provided with a generator, inverter, or certain lower-quality UPS devices, we recommend filtering power to remove harmonics and ensuring the voltage supply is stable.

### Bass Management

Bass management divides the input audio signal into low frequency and high frequency content at the subwoofer crossover frequency. The signal content below the crossover frequency is reproduced by the subwoofer. The signal content above the crossover frequency is reproduced by the monitors.

The 7380A supports two bass management methods: the centralized bass management method and the distributed bass management method.

### Centralized bass management

The centralized bass management method uses fixed 85 Hz crossover filters in the analog output channels in the 7380A SAM subwoofer for the signal feeds going to monitors. All analog signal cables are first routed to the subwoofer's IN connectors and then from the OUT connectors to the respective main monitors. The outgoing signal has the low frequencies removed.

The fixed highpass filters inside the subwoofer can be used when using the in-built controls or with GLM software-based control. However, we recommend the much more flexible distributed bass management method.

### Distributed bass management

In the distributed bass management method the monitors and the subwoofer receive full bandwidth audio signal and the filtering is done separately inside each monitor and subwoofer. The lowpass and highpass filters are set in synchrony by the GLM management network. This method is only available in systems where GLM computer management is used and with monitors supporting this method. The subwoofer crossover frequency can be adjusted from 50 Hz to 100 Hz.

The distributed bass management supports three different signal cabling configurations:

- All channels are routed through the subwoofer's IN/OUT connectors to the respective monitors.
- Y-cables split each signal to the subwoofer's IN connector and the monitor's input.
- Signal sources with dual outputs for each channel, one going to the subwoofer, the other going to the monitor.

### Use With GLM Control Network

The 7380A SAM subwoofer is fully compatible with Genelec Loudspeaker Manager GLM software, the proprietary Genelec monitor management network, and all Genelec SAM monitors.

Managing the 7380A SAM subwoofer using GLM software control unleashes the full power of room compensation in the 7380A SAM subwoofer, enabling 20 parametric room compensation filters. This powerful room compensation functionality is only available when the GLM is used. Detailed information on the use with the GLM network is presented in the GLM System Operating Manual.

### System setup

The 7380A SAM subwoofer reaches its full potential when set up and calibrated using the GLM software. Genelec Loudspeaker Manager GLM and the proprietary Genelec monitor management network offer

- automated acoustic equalization individually for every monitor and subwoofer
- automated level alignment
- distance (acoustic time-of-flight) calibration
- aligning of the subwoofers for bass management

for any reproduction system from stereo to complex 3D immersive setups, including one or more subwoofers. GLM setup is fast and accurate. It can precisely address the typical narrow-band low frequency modal resonances and radiation loads of a room and offers precise frequency response compensations. The settings can be controlled with a computer or the settings can be permanently stored in the monitors and subwoofers, to make the setup available at all times even when the computer is not in use. Genelec recommends setting up SAM monitoring systems using the GLM. You can find a detailed description of the setup process and the use of GLM in the GLM System Operating Manual.

The setup using GLM 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 GLM Adapter device to the computer USB port using cable included in the GLM User Kit.
- Download the GLM software at the Genelec web site ([www.genelec.com](http://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 subwoofer, use the GLM

software to write the setting into the subwoofer (use menu item "Store | Store the Current Group Settings...").

After storing the acoustic settings using the GLM software, when the GLM network is disconnected, the settings are retrieved and activated by setting the STORED switch to the ON position.

With GLM software active and controlling the 7380A SAM subwoofer, the use of analog and digital inputs is controlled by the GLM software entirely. In the software 'Input Type' in the 'Group' definition sets this. The GLM software allows you to select and switch between the analog and digital audio inputs.

When using the in-built settings (stand-alone manual mode), an AES/EBU digital audio signal will override analog signal. This means, if a valid digital audio clock is detected, the digital audio is selected over the analog audio.

When the GLM acoustic settings have been stored in the 7380A SAM subwoofer and are active, the input is selected by the 'Group' settings in the GLM software when the settings are stored.

## Setup Without GLM

### Cabling

This subwoofer offers a fixed 85 Hz analog crossover filter. The fixed crossover filter is pre-selected when the subwoofer is delivered from the factory. All analog outputs on the subwoofer are highpass filtered in this mode of operation.

When using this method, run each signal cable first to the subwoofer. Then, run a cable from the respective output to a monitor. When using the LFE signal, run the LFE signal to the subwoofer LFE in connector. No computer access to the subwoofer is needed to use this crossover mode.

### Stand-Alone Controls

Please note that there is a slight delay before the controls listed below take effect. This is normal.

The **BASS ROLL-OFF** controls compensate for the very low frequency boost caused by the boundary loading, reducing the 20 Hz level in 4 dB steps. Individual controls add together, applying both controls adds to a total of 12 dB attenuation. Setting both switches to the "OFF" position obtains a flat response.

The **PHASE** switches adjust the subwoofer phase. This enables the subwoofer to be put in phase with a selected main monitor.

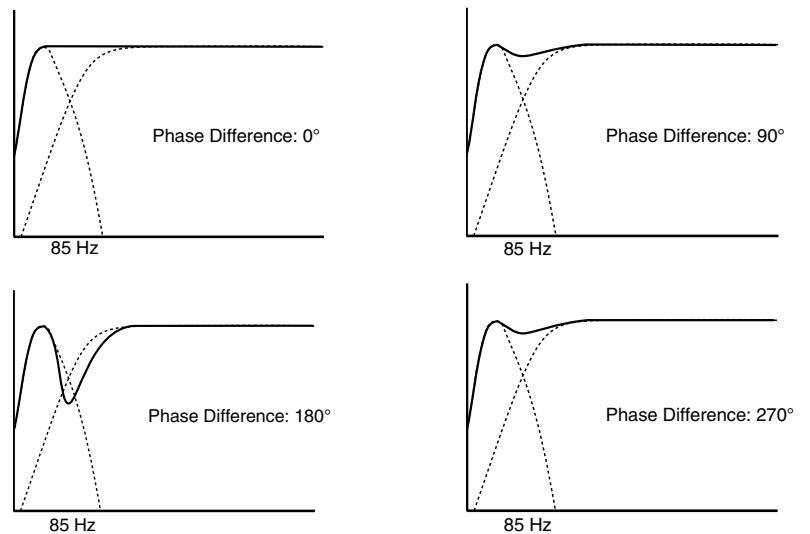


Figure 3. The effect of phase difference between the subwoofer and the main monitors

Incorrect phase alignment can cause a drop in the audio level at the crossover frequency. Correct phase alignment eliminates this level dip. See chapter "Setting the Phase Switches."

The **DIGITAL LFE** switch selects the low pass frequency for the LFE signal (see "LFE CHANNEL" below). The possible frequencies are 85 Hz for "OFF" position and 120 Hz for "ON" position.

The **LFE CHANNEL A/B** selects which subframe is carrying the LFE signal. The position "ON" selects subframe A as the LFE signal route, position "OFF" selects subframe B. If subframe A is selected for LFE, subframe B is assumed to carry the main channel audio and vice versa.

The **LFE +10 dB** function increases the LFE channel level by +10 dB. See chapter "Using the LFE +10 dB function."

The **LEVEL** switches scale down the subwoofer output level. The switch settings are additive and they combine with the rotary level adjustment control.

The **TEST TONE** switch turns on the 85 Hz test tone. This tone is intended for manually calibrating the subwoofer phase. See chapter "Manual Phase Adjustment Method"

The **ISS** switch activates the signal sensing automatic energy saving function. This function puts the subwoofer in very low power consumption state when there is no input signal for a period of time.

The **STORED** switch selects the room acoustic compensation settings stored inside the memory of the subwoofer instead of the settings in the built-in DIP switches in the subwoofer. The stored settings can be

created using the GLM Loudspeaker Manager Software and the GLM control network. The stored settings can provide superior flexibility and accuracy compared to the subwoofer's local user interface controls.

The **ROTARY LEVEL CONTROL** In addition to the LEVEL switches, the level of the subwoofer relative to the loudspeakers can be adjusted with this potentiometer.

#### Connector Panel Light

When used without a connection to the GLM software, the light on the connector panel is green, indicating normal operational mode. A 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 can cause a drop in the audio level at the crossover frequency (see Figure 3).

The phase alignment between the main monitors and subwoofer depends on the listening position, the position of the subwoofer and the monitors in the room. The phase adjustment should be done only after the preferred positions are found and the subwoofer and monitor levels have been aligned.

The GLM software can adjust the phase automatically.

If the GLM is not available, the following manual phase matching can be applied.

#### Manual Phase Adjustment Method

The Genelec 7380A subwoofer is equipped

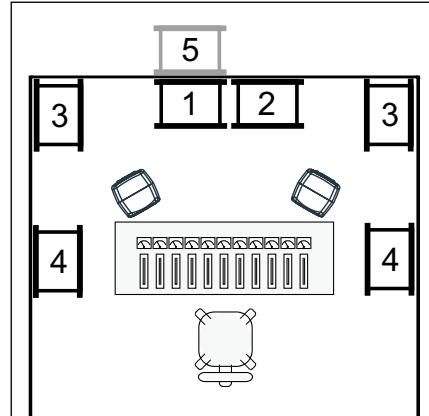


Figure 4. Examples of subwoofer positioning. 1 and 2 are good starting positions for a single subwoofer and also work well with two linked subwoofers. Position 3 causes a significant bass boost and may cause asymmetric spatial imaging if only one subwoofer is used. Position 4 also works best with two subwoofers. Flush mounting (pos. 5) generally works well.

with a built-in 85 Hz frequency test tone generator for phase alignment at the fixed 85 Hz crossover frequency. Connect the monitor to the subwoofer's "TEST 1" output with a cable. Set the TEST TONE switch to "ON." Now, you hear an 85 Hz test tone through the subwoofer and the main monitor.

- Toggle the -180° phase switch on and off. Set it to the position giving the lowest sound level at the listening position.
- Toggle the -90° phase switch on and off. Set it to the position giving the lowest sound level at the listening position.
- Finally, move the -180° phase switch to the opposite setting. Deactivate the test signal. The phase adjustment is now complete.

#### Using the LFE +10 dB Function

The LFE channel is usually recorded 10 dB lower than the main channels so that there is 10 dB of extra level (headroom) available.

Most AV processors automatically add 10 dB to the LFE channel to restore the level in the LFE channel but some medium format mixing consoles and many smaller consoles do not have the facility to apply the +10 dB gain to the LFE. To overcome this limitation Genelec subwoofers provide a +10 dB LFE gain selectionchannels, 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 the Subwoofer in a Room

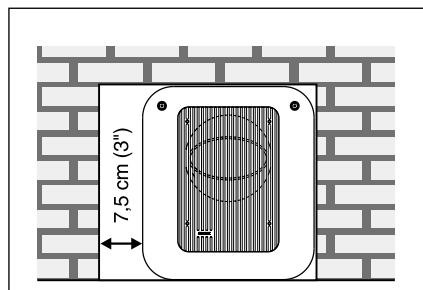
The location of the subwoofer can affect the frequency response and sound level dramatically particularly when the room acoustic effects are strong. Even small changes in a subwoofer's location can make a marked difference in the frequency response. To begin, place the subwoofer near the front wall slightly offset from the room center line. Often systematic 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 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). This avoids a loss of audio level at low frequencies created by the audio reflecting off the wall and cancelling certain frequencies radiated by the subwoofer.

### Operating Environment

This subwoofer is designed for indoor use only. The permissible ambient temperature is 15-35 degrees Celsius (50-95°F) and relative humidity 20 - 80% (non-condensing). When the product has been stored or transported in a cool environment and is taken into a warm room, wait about one hour 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.



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

### Flush Mounting

When the subwoofer is flush mounted in a wall or cabinet, ensure unrestricted airflow in the reflex port and amplifier cooling. 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 what is needed for ventilation as this may cause unwanted acoustic effects.

### Using Multiple Subwoofers

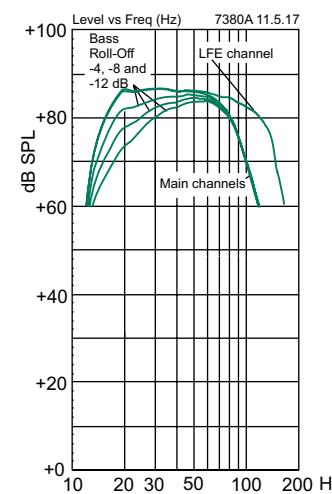
Multiple Genelec 7380A subwoofers can be coupled together in high SPL applications. The necessary cabling is different for digital and analog signals. When subwoofers are close to each other, the sound level increases typically by 6 dB for each doubling of the number of subwoofers. When subwoofers are far from each other, the total increase in the sound level can be less. It is safe to assume the increase is 3 dB for each doubling of the number of subwoofers. Accurate understanding of the increase in sound level requires acoustic measurements.

### Digital Cabling

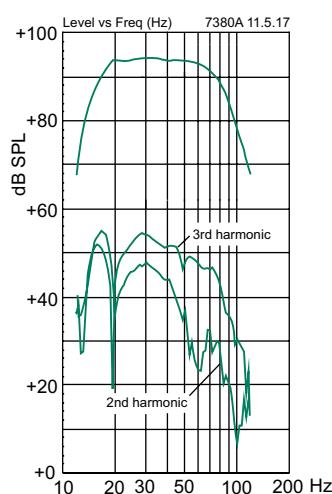
Run a signal cable from the AES/EBU OUT connector of the first subwoofer in the chain to the AES/EBU IN connector of the next subwoofer. Check that the Digital LFE and LFE Channel A/B control switches have the same settings in all subwoofers in the chain.

### 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.



**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 7380A.



**Figure 6.** The curves above show the harmonic distortion analysis of the 7380A in free field. In half space the SPL will be 6 dB higher.

### Control Switch Settings When Using Multiple Subwoofers

We recommend using the GLM software and its AutoCal function for subwoofer calibration. Then, no manual adjustments on the subwoofer are necessary.

- If the GLM is not available, manual adjustments can be done as follows:  
Calibrate subwoofers one by one. Turn on only one subwoofer at the time.
- Calibrate the subwoofer level to match

the level the monitors. Monitors are usually also calibrated to deliver the same level at the listening position. Use the rotary level adjustment trimmer on the subwoofer and suitable test signals. Normally an octave wide pink noise signal located around 1 kHz is used for monitors and an octave wide pink noise around 40 Hz is used for the subwoofer. If you use a sound level meter, correct for the weighting – for example using A weighting in an SPL meter reduces the level reading for low frequencies relative to the mid frequencies. We recommend using an acoustical measurement system able to show the full frequency response for improved accuracy.

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 accordingly.

## Maintenance

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

## Guarantee

Genelec guarantees the subwoofers for two years against manufacturing faults or defects

altering performance. You can extend the guarantee to five years by registering the product at [www.genelec.com](http://www.genelec.com). Refer to the reseller for full sales and guarantee terms.

## Safety Considerations

The 7380A has 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 Genelec certified service personnel.
- 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.
- Free flow of air behind and around the subwoofer is necessary to maintain sufficient cooling. Do not obstruct airflow around the subwoofer.
- This subwoofer is 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**

<b>Model</b>	<b>7380A</b>
Lower cut-off frequency -6 dB	16 Hz
Upper cut-off frequency -6 dB (main channel/LFE)	100 Hz/120 Hz
Driver	381 mm (15 in)
Harmonic distortion at 1 m on axis in half space, 30 to 85 Hz 2nd 3rd	≤ 1% @ 100 dB SPL ≤ 2% @ 100 dB SPL
Maximum short term sine wave SPL output averaged from 30 to 85 Hz, measured in half space at 1 meter	≥ 119 dB SPL
Maximum peak SPL output with random pink noise, measured in half space at 1 meter	≥ 123 dB SPL
Self generated noise at 1 m on axis (A-weighted)	<5 dBA
Weight	69 kg (152 lbs)
Dimensions H x W x D	685 x 718 x 492 mm (27 x 28 <sup>1</sup> / <sub>4</sub> x 19 <sup>3</sup> / <sub>8</sub> in)

**AMPLIFIER SECTION**

Short term amplifier output power (Long term output power is limited by driver unit protection circuitry)	800 W
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	<2 W 40 W 600 W

**SIGNAL PROCESSING SECTION**

Signal connectors	7.1 channel analog IN/OUT Analog Link IN/OUT Digital AES/EBU IN/OUT
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) Adjustment range (LEVEL dip switches + rotary level control)	+24.0 dBu -6 dBu +48 dBu 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	16 - 24 bits 32 - 192 kHz
Digital input sensitivity (100 dB SPL at 1 m) Digital input maximum attenuation Positive input gain selection (GLM control)	-30 dBFS 48 dB +6, +12, +18 dB
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™, GLM manual, Stand-alone
Crossover setting in subwoofer's input/output channels Centralized Bass Management (for analog signal) Distributed Bass Management (GLM control)	Input low pass fixed 85 Hz, output high pass fixed 85 Hz Input low pass selectable 50 to 100 Hz, output no filtering
LFE cutoff	120 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

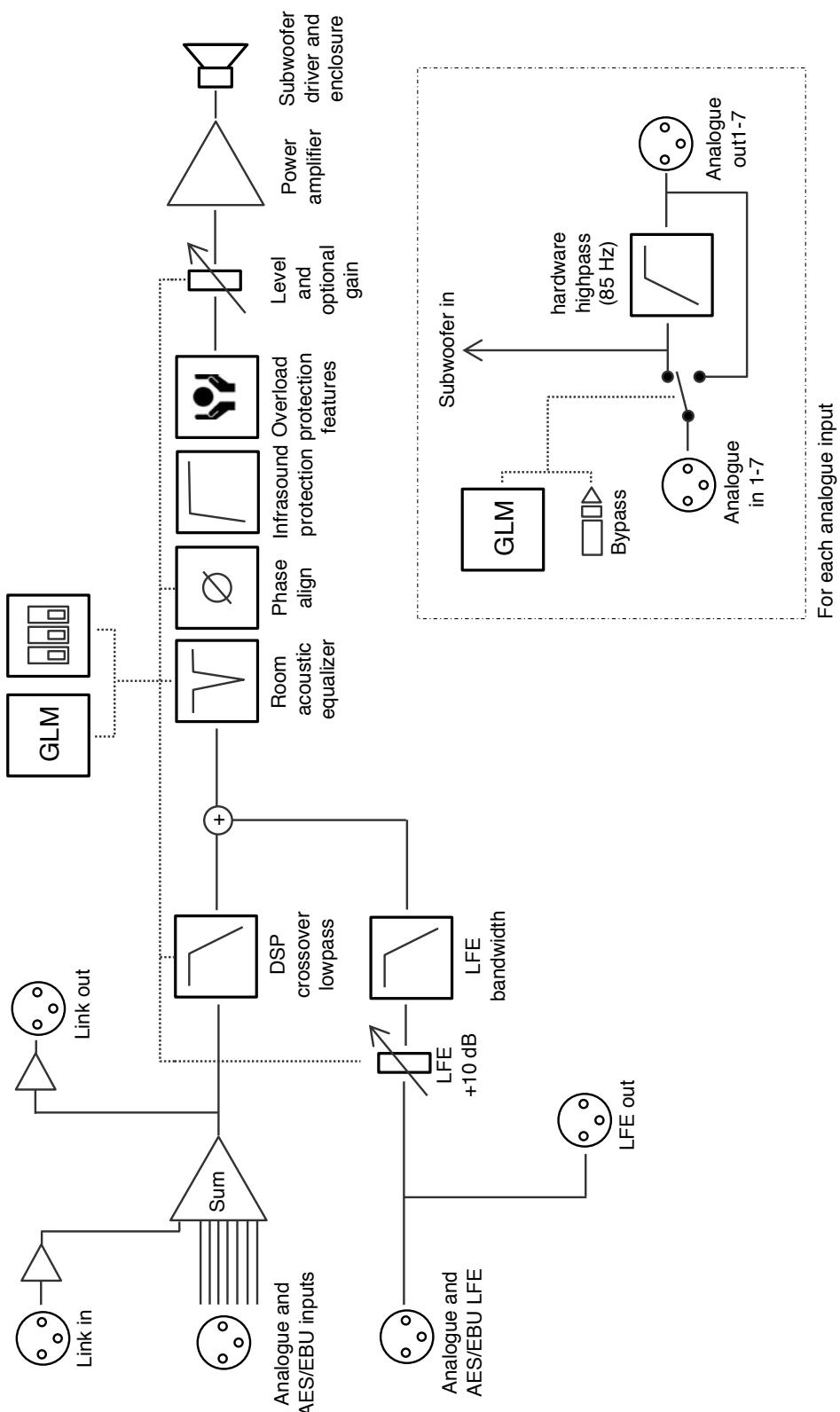


Figure 7. The signal path block diagram of the 7380.

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# 真力 7380A 智能有源超低音箱

## 介绍

感谢您选择 Genelec 真力。通过为您提供最精准的声音再现，实现您的梦想，是真力自 1978 年成立以来的不懈追求。如今，世界上已经有超过一百万只真力音箱正在使用中——欢迎加入我们！

每一只真力音箱都诞生于芬兰伊萨尔米的总部工厂，并且在出厂前逐一经过严格检测。真力音箱经久耐用，在产品周期内，我们力求为用户提供出色的技术支持和服务。

请扫描音箱包装上的二维码，注册您的音箱。注册之后，您的音箱将获得长达 5 年的质保服务。更多信息请参考 [www.genelec.cn](http://www.genelec.cn) 的“服务支持 > 维修与延保服务”页面。

## 系统概述

真力 7380A 智能超低音箱可以轻松集成到基于模拟或数字信号的系统中。7380A 可以搭配真力 GLM™ 软件使用，甚至可以为其他品牌的全频监听音箱提供低频扩展。

7380A 专为模拟多声道系统和 AES/EBU 数字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。

通过调节 7380A 接口面板上的物理开关就能满足基本使用需求，还可以通过真力音箱管理软件 (GLM) 针对房间声学对音箱进行精确校准。GLM 软件可以在 macOS 或 Windows 系统中运行，并能够将声学校准后的数据存储到超低音箱中。GLM 软件还可以作为监听控制器使用，支持同时控制 80 只以上的真力 SAM™ 系列音箱。

在待机模式下，7380A 消耗的功率小于 2 瓦。智能休眠功能 (ISS™) 启用后，在一段时间内未检测到输入信号时，7380A 将自动进入待机模式。当检测到输入信号时，它将自动回到工作状态。用户可通过 GLM 软件调整 7380A 进入待机模式的等待时间。当启用 ISS 功能后，您的音箱既能够节能省电，又能够随时待命。

## 包装

每只 7380A 配备 1 根电源线，1 根长度 5 米的 GLM 网线，以及此操作手册。

## 真力音箱管理软件 (GLM) 及用户套件

真力音箱管理软件 (GLM) 可以让 7380A 发挥出其最佳性能，使其与房间环境精准耦合。您可以在 [www.genelec.cn](http://www.genelec.cn) 的“服务支持 > GLM 软件下载”页面免费下载软件，请及时更新版本以享用最新功能，或考虑使用基于云服务的版本。

GLM 用户套件包含适配盒和校准话筒，是搭建和控制 GLM 网络必不可少的硬件。您可以从真力经销商处购买用户套件。

## 连接

在连接信号线之前，请关闭所有音箱的电源。

### 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接，最大输入电平为 +24 dBu。

### 模拟 LFE 输入

这个卡侬 (XLR) 输入接口是 LFE 声道信号的专用接口。此通道的截止频率上限到 120 Hz。LFE 声道的输入灵敏度可以设置为与主声道一致，或相对于主声道大 10 dB。可以通过打开音箱接口面板上的“LFE +10 dB”拨档开关，或在 GLM 软件中设置。

### AES/EBU 输入

7380A 提供 1 个 AES/EBU 数字卡侬 (XLR) 输入接口，用于接收立体声数字音频信号。

使用真力 9301 数字接口可以对数字多声道系统进行低频管理，9301 通过数字输入连接到 7380A，将超低音箱的数字卡侬 (XLR) 输入接口扩展至 4 个，正好满足包括 LFE 声道在内的 7.1 多声道音频系统。

### 模拟环出通道 1-7

这些卡侬 (XLR) 平衡环出接口用于连接全频音箱。

7380A 支持两种低频管理模式，根据不同的低频管理模式，模拟环出接口将输出不同的信号：未经任何处理的输入信号（在分布式低频管理模式时，采用可调分频器）或者经过高通滤波的输入信号（在集中式低频管理模式时，采用固定分频器）。

固定分频器的分频点为 85Hz。可调分频器的分频点可通过 GLM 软件调节，可调范围为 50 Hz 至 100 Hz。

详情请参阅“低频管理”章节。

### 模拟 LFE 环出

这个接口输出的信号，是模拟 LFE 输入信号的完整复制。通常，当系统中包含多只超低音箱时，可以将 LFE 声道信号从上一只超低音箱的模拟 LFE 环出接口传输至下一只超低音箱的模拟 LFE 输入。

### 串接环出

这个接口输出的信号为模拟输入通道 1-7 的信号总和。当采用低频管理的模拟系统中包含多只超低音箱时，超低音箱之间需要连接此接口传输低频管理部分的信号。详情请参阅“使用多只超低音箱”章节。

### 串接输入

这个接口用于接收来自串接环出接口的信号。采用低频管理的模拟系统中包含多只超低音箱时，超低音箱之间需要连接此接口传输低频管理部分的信号。当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

7380A 通过此接口输出测试信号，用于对齐超低音箱和全频音箱之间的相位。用户可通过打开 7380A 接口面板上的“测试信号 (Test Tone)”拨档开关来输出 85Hz 的单频测试信号。详情请参阅“手动校准相位”章节。

### 输出 2 / 测试 2

这个卡侬 (XLR) 输出接口为后续功能预留。

### AES/EBU 环出

这个接口输出的信号，是 AES/EBU 输入信号的完整复制。当系统中包含多只超低音箱时，通过 AES/EBU 环出接口将数字输入信号完整地输出给下一只超低音箱。在 2.1 数字监听系统中，还可以通过此接口将立体声数字信号分配给全频音箱。

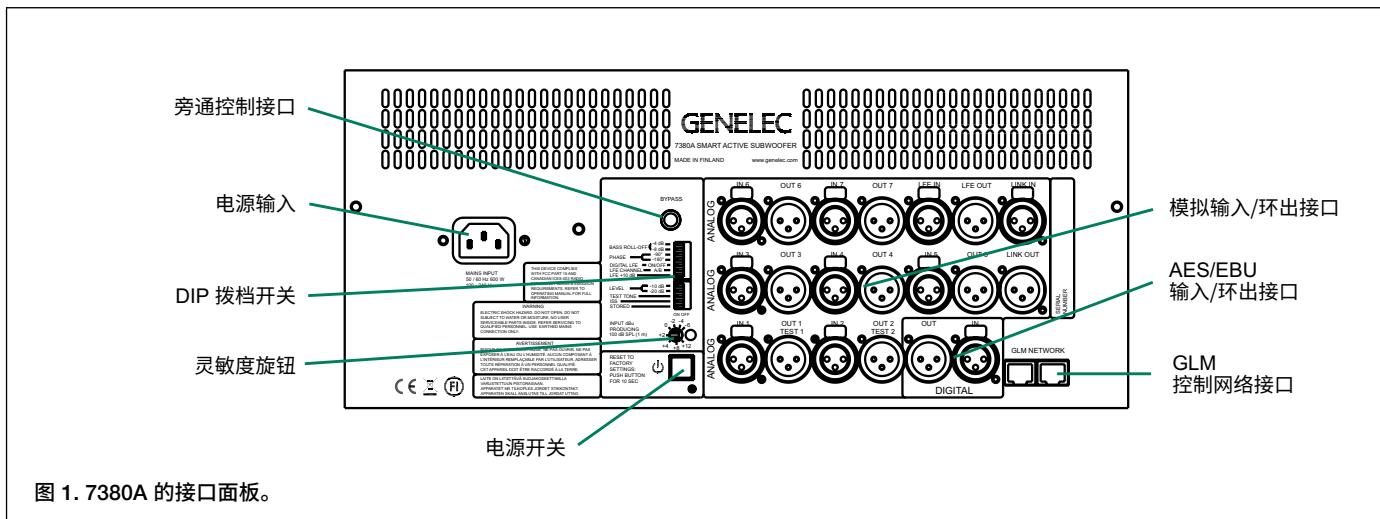


图 1. 7380A 的接口面板。

### 旁通

这个接口可连接 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。当插头的尖 (TIP) 与套 (SLEEVE) 连通时，低频管理功能将被旁通，也就是各通道信号将不经过低频管理。此时，超低音箱只重放 LFE 声道信号，模拟环出通道 1-7 的信号将不会经过高通滤波。

当超低音箱脱离 GLM 软件使用时，通过此接口来旁通低频管理功能。

用户在 GLM 软件中也可以旁通低频管理功能，并能进行更广泛的控制和调整，无需再使用此接口。

### GLM 控制网络

真力音箱管理软件 (GLM) 可以对 7380A 进行校准和控制。这需要将电脑通过适配盒连接至 7380A 的 GLM 控制网络接口。请使用 5 类及 5 类以上的网线 (RJ45)。

GLM 控制网络基于真力专有的协议，不兼容以太网，请勿连接以太网设备。

### 电源输入

电源输入支持全球通用电压(100-240 伏交流电, 50-60 Hz)，因此 7380A 可以在不同电源规格的环境中使用。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

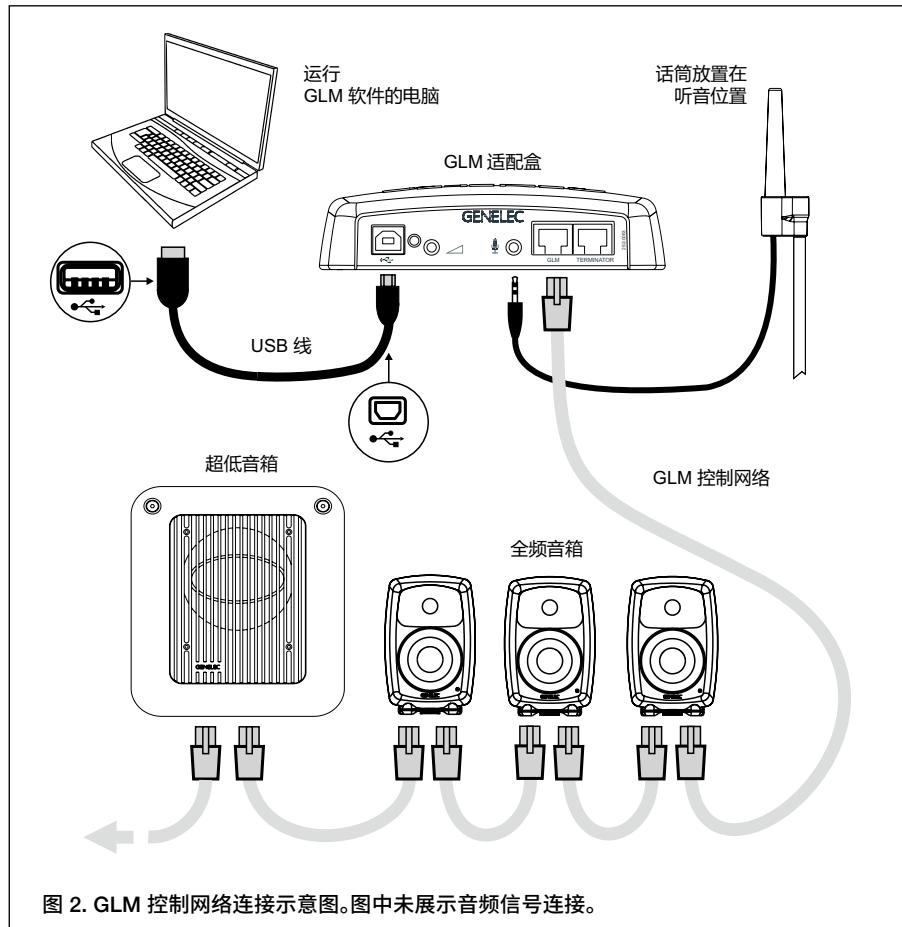


图 2. GLM 控制网络连接示意图。图中未展示音频信号连接。

### 全频音箱重放。

7380A 支持两种低频管理模式：集中式低频管理和分布式低频管理。

### 集中式低频管理

采用集中式低频管理模式时，7380A 的模拟环出通道 1-7 都将使用固定的分频滤波器，分频点为 85 Hz。从音源输出的所有模拟线缆，需要先连接到 7380A 的模拟输入接口，

再由其模拟环出接口连接至对应的各只全频音箱。采用这种方式时，全频音箱接收到的信号不包含 85 Hz 以下的低频内容。

无论用户是否使用 GLM 软件来设置音箱，此 85 Hz 固定分频器都可以被启用。但我们建议您采用更加灵活的分布式低频管理模式。

## 分布式低频管理

采用分布式低频管理模式时，超低音箱和各只全频音箱都将接收未经任何处理的音频信号，并通过其各自内部的滤波器进行处理。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。低频管理的分频点可在 50 Hz 至 100 Hz 范围内调节。

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，再由其环出接口连接至对应的各只全频音箱。
- 使用一分二线缆，从音源设备的输出分别连接至超低音箱和各只全频音箱。
- 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各只全频音箱。

## 使用 GLM 进行音箱设置

7380A 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，7380A 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

仅有经过 GLM 软件设置和校准后，7380A 才能发挥出其最佳性能。GLM 软件配合专有的真力控制网络可以提供以下功能：

- 对每只音箱单独进行自动均衡校准
- 自动电平校准
- 自动距离校准（声学延时）
- 自动相位校准（低频管理模式下）

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，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 软件来设置 SAM 系列音箱。有关 GLM 软件使用的详情请见《GLM 使用手册》。

### GLM 使用便捷，包括以下步骤：

1. 使用 5 类网线 (RJ45 接头) 将每只音箱（包括超低音箱）串接起来，最终连接至 GLM 适配盒（见图 1）；
2. 将 GLM 适配盒（包含在 GLM 用户套件中）通过 USB 线连接至电脑；
3. 使用话筒支架，将真力校准话筒（包含在 GLM 用户套件中）放置于听音位置。校准话筒指向正上方，话筒顶部与听音者耳朵齐平；
4. 将真力校准话筒连接到 GLM 适配盒；
5. 从真力官方网站 ([www.genelec.cn](http://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 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。用户可在“编组预设 (Group Preset) > 编辑 (Edit) > 输入模式 (Input Mode)”中选择模拟或数字输入。还可以通过 GLM 软件实时切换输入模式。

在单机模式（脱离 GLM 软件使用）下，AES/EBU 数字音频信号的优先级高于模拟音频信号，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

7380A 超低音箱内部搭载了固定模拟分频器 (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）。在此模式下，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。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。此模式无需连接电脑并运行 GLM 软件进行设置。

### 拨档开关

请注意，以下控制功能在启用时会略有延迟，属于正常现象。

**低频滚降 (BASS ROLL-OFF)** 控制用于补偿由房间墙面或地面引起的超低频率隆起，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声压级产生衰减。详情请参阅“相位”章节。

**数字 LFE (DIGITAL LFE)** 开关用于选择 AES/EBU 数字输入通道上低通滤波的截止频率（参阅下方“数字 LFE 通道”）。将开关拨至“OFF”时，频率为 85 Hz，用于低频管理功能。拨至“ON”时，频率为 120 Hz，用于传输 LFE 声道信号。

**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 85 Hz 测试信号，信号将从“输出 1 / 测试 1 (OUT1 / TEST 1)”接口输出。该测试信号用于手动校准超低音箱的相位，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。此功能启用后，当超低音箱在一段时间内未输入信号时，音箱将自动进入超低功耗的待机模式。

**保存 (STORED)** 开关拨至“OFF”时，音箱使用背板上物理开关的设置；此开关拨至“ON”时，音箱使用 GLM 软件校准后存储在音箱内部的设置，这些设置需要通过 GLM 软件生成。与音箱的拨档开关相比，GLM 软

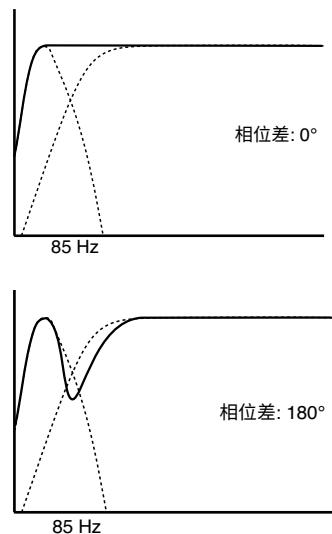


图 3. 全频音箱与超低音箱之间的相位差所造成的影响。

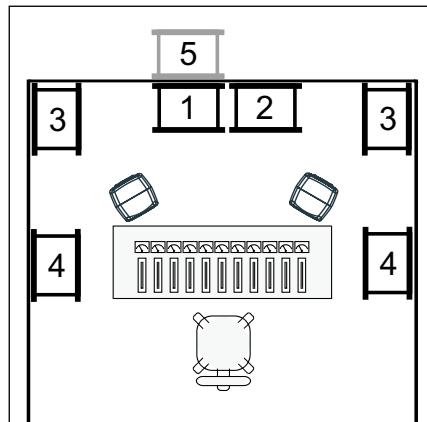
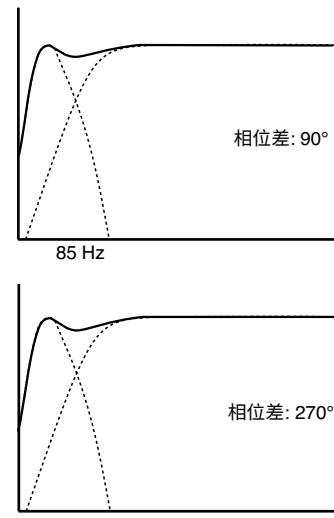


图 4. 超低音箱摆位示例。

使用一只超低音箱或两只串接的超低音箱(重放相同信号)时,位置 1 和位置 2 是较为理想的位置。摆放在位置 3 可以获得较为明显的低频提升,但需要左右对称摆放两只超低音箱,若仅使用一只,可能会导致低频声像不对称。位置 4 也适用于对称摆放两只超低音箱。嵌入式安装(位置 5)通常也是很好的选择。

件校准后的设置更具卓越的灵活性、准确性。

**灵敏度旋钮 (ROTARY LEVEL CONTROL)**  
同电平 (LEVEL) 开关一样,用于调节超低音箱的电平,使之与全频音箱匹配。

#### 接口面板指示灯

音箱在单机模式(脱离 GLM 软件使用)下,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,会导致分频点附近频率的声压级下降(见图 3)。

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 7380A 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。将全频音箱连接至该输出接口,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

LFE 声道通常在录制时,比其它主声道低 10 dB,以获得 10 dB 的峰值储备。

多数 AV 处理器会自动在 LFE 声道增加 10 dB,以补平 LFE 声道的电平。然而,在一些中型调音台和大部分小型调音台上,没有为 LFE 声道增加 10 dB 的功能。为了弥补这一限制,真力超低音箱提供了 LFE +10dB 的功能。此功能默认关闭。

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,通常可以将超低音箱靠近墙面摆放。超低音箱靠近角落摆放,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,导致低频能量被减弱。

#### 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 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，并确保倒相孔附近的空气正常流通。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，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 7380A 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。将多只超低音箱紧靠摆放时，音箱的数量每增加一倍，总声压级通常会增加 6 dB，而多只超低音箱互相远离摆放时，总声压级的叠加效果会有所减弱。保守估计音箱数量每增加一倍，总声压级会增加 3 dB。如需获得精确的声压级数值，请使用声级计等设备进行测量。

### 数字信号连接

只需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

当系统进行低频管理，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。

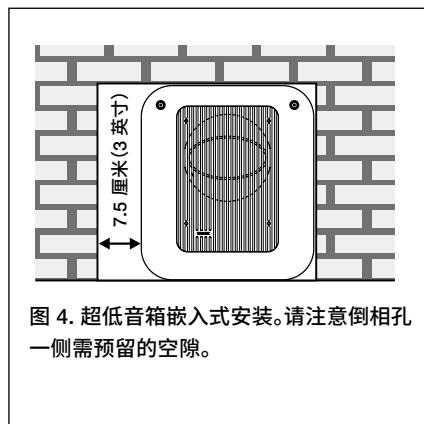


图 4. 超低音箱嵌入式安装。请注意倒相孔一侧需预留的空隙。

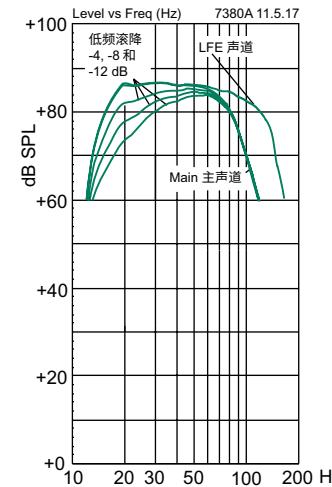


图 5. 以上曲线展示了主声道经过 85 Hz 低通滤波后的频率响应，LFE 声道的频率响应，以及不同低频滚降(Bass Roll-Off)控制对 7380A 频率响应的影响。

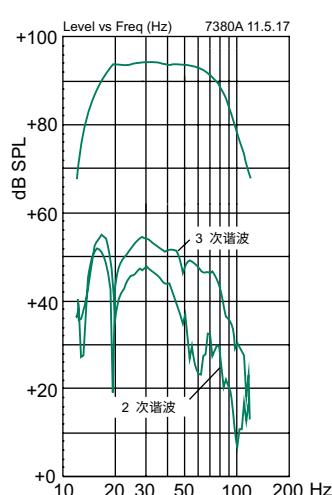


图 6. 以上曲线展示了 7380A 在自由场下的谐波失真分析。在半开放空间中，声压级会增加 6 dB。

### 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](http://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

7380A 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。

	7380A
低频截止频率 -6 dB	16 Hz
高频截止频率 -6 dB (主通道 / LFE 声道)	100 Hz/120 Hz
驱动单元	381 毫米 (15 英寸)
半开放空间内, 总谐波失真 @1米 轴上 30 Hz - 85 Hz 2 次 3 次	$\leq 1\% @ 100 \text{ dB SPL}$ $\leq 2\% @ 100 \text{ dB SPL}$
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	$\geq 119 \text{ dB SPL}$
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	$\geq 123 \text{ dB SPL}$
自身噪声电平 @ 1 米 轴上 (A 计权)	$<5 \text{ dBA}$
重量	69 千克 (152 磅)
尺寸 高度x宽度x深度	685 x 718 x 492 毫米 (27 x 28 <sup>1</sup> / <sub>4</sub> x 19 <sup>3</sup> / <sub>8</sub> 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)	800 瓦
在标称输出功率下的功放系统失真参数	$<0.01\%$
电源电压	100-240 伏交流电 50/60 Hz
功耗 待机 (ISS) 空闲 满输出, 峰值	$<2 \text{ 瓦}$ $40 \text{ 瓦}$ $600 \text{ 瓦}$

信号接口	7.1 通道模拟输入/环出接口 模拟串接输入/环出接口 AES/EBU 数字信号输入/环出接口
模拟信号输入接口:卡侬 (XLR) 母座 (平衡式 10 k 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 模拟输入灵敏度 (100 dB SPL @1 米) 调节范围(电平 (LEVEL) 拨档开关 + 灵敏度旋钮)	$+24.0 \text{ dBu}$ $-6 \text{ dBu}$ $+48 \text{ dBu} \text{ 至 } -6 \text{ dBu}$
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	16 - 24 bits 32 - 192 kHz
数字输入灵敏度 (100 dB SPL @1 米) 数字输入最大衰减 输入信号可选增益 (在 GLM 软件中调节)	-30 dBFS 48 dB $+6, +12, +18 \text{ dB}$
控制网络 类型 连接方式	专用的 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
超低音箱输入/环出通道分频设置 集中式低频管理 (仅支持模拟信号) 分布式低频管理 (仅支持在 GLM 软件中调节)	输入: 低通 85 Hz (固定), 环出: 高通 85 Hz (固定) 输入: 低通 50-100 Hz (可调节), 环出: 无滤波器
LFE 通道截止频率	120 Hz
中频抑制 > 400 Hz	$\geq 50 \text{ dB}$
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 软件中以 15° 为步长

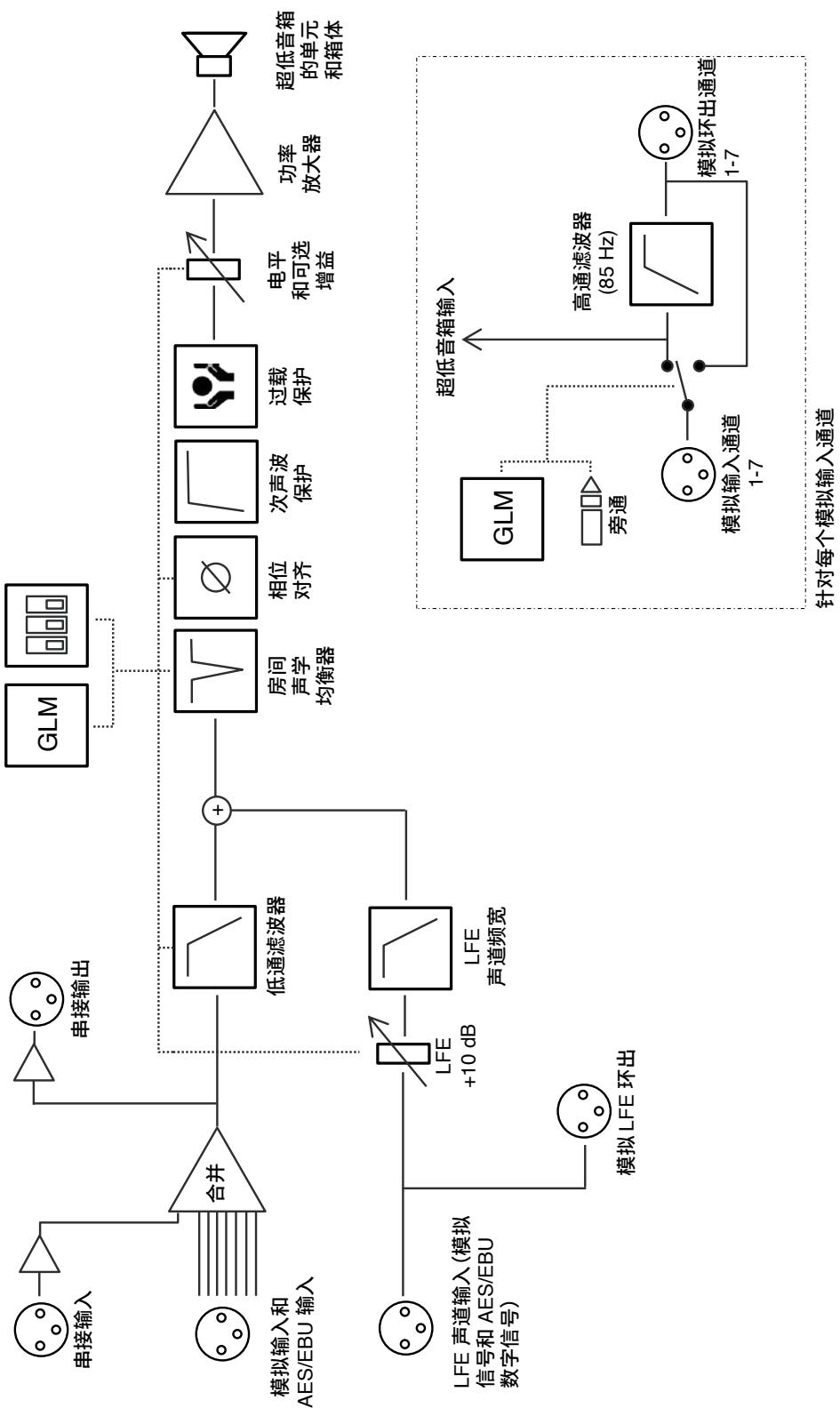


图 7. 7380A 的信号流程框图

# 7380A 操作手册