GENELEC®

SE™ Small Environment System Operating Manual

AutoCal™ dsp GLM SE

GENELEC SE™ SMALL ENVIRONMENT DSP SYSTEM OPERATING MANUAL

Do not attempt to operate the system without first becoming acquainted with this manual.
This document refers to software version 1.2.x. The third digit “x” denotes small corrective updates and may vary.

Contents

INTRODUCTION

Congratulations and thank-you for the purchase of this Genelec SE™ DSP Loudspeaker System. This system is designed to integrate easily into the digital production environment. There are several ways to configure and operate the SE™ systems for a wide variety of high quality audio applications.

This manual addresses the Genelec Loudspeaker Manager GLM.SE™ and the proprietary Genelec loudspeaker control network, guiding step-by-step through the setup process. The SE7261A subwoofer can also be used in stand-alone mode just like any other subwoofer, but without enjoying the benefits of additional flexibility and versatility of the GLM.SE™.

SOFTWARE REGISTRATION

Please register your software at Genelec's website www.genelec.com. The registration form is in the Professional Monitoring/Products/DSP Monitoring Systems section. The user registration is essential to Genelec as it allows keeping track of software versions as well as customer hardware revisions, allowing us to serve you better.

This registration process requires the GLM software "Box Nr." code. This code is physically printed on the software package. Software updates cannot be obtained without complete, prior system registration.

GLOSSARY

.gse file	GLM.SE™ System Setup File
.gtd file	Genelec Time Data file containing the computed impulse responses of a loudspeaker or subwoofer.
3.5 mm Measurement Signal Cable	A 3.5 mm stereo jack-to-jack interconnection cable used to connect the MIC OUT socket on the Network Interface to a computer's soundcard input.
AccuSmooth	A proprietary smoothing algorithm that has a higher resolution (narrower smoothing bandwidth) at low frequencies than a standard 1/3 octave smoothing, and a similar resolution at high frequencies. This is used by AutoCal™ to ensure accurate placement of notch filters at critical bass frequencies.
Acoustical Settings Editor	A page in the GLM.SE™ that provides access to the Acoustical Settings in the loudspeaker or subwoofer. The Interactive Response Editor can also be accessed here.
Acoustical Setup Wizard	A self-guided Wizard that allows for manual or automated (AutoCal™) calibration of the Loudspeaker Acoustic parameters.
Audio channel	Although the definition of an audio channel is rather straightforward and clear, it should not be confused with loudspeakers or audio cables in the loudspeaker system. The AES/EBU digital audio cables may carry one or two audio channels. There may be one or more loudspeakers reproducing one audio channel.
Bass Management	Bass Management is used to reproduce the low frequency content of audio channels over one or more subwoofers instead of loudspeakers. This can be the low frequency content from the full-bandwidth audio channels. Parts or the entire LFE audio channel can also be bass managed.
Digital Signal Cable	The digital signal cable carries an AES/EBU audio signal. The GLM.SE™ supports AES/EBU digital audio cables typically carrying two channels of audio.
Digital Thru	The connector on the back of a loudspeaker used to pass the AES/EBU digital audio signal presented to the digital input connector onto another loudspeaker.

Genelec 8200A Calibration Microphone	A factory calibrated acoustic measurement microphone used for AutoCal™ system alignment.
Genelec AutoCal™	Genelec AutoCal™ is a property of the GLM.SE™ software that utilizes built-in test signal generators inside the Genelec SE7261A Subwoofer to acoustically measure and align the loudspeaker system.
Genelec AutoPhase	Genelec AutoPhase is a part of Genelec AutoCal™. It aligns the phase of the subwoofer in the system to the designated loudspeaker(s).
Genelec Sound Card	Genelec Sound Card is a high quality sound card integrated in the Network Interface device. It provides a precise frequency response measurement with Genelec 8200A Calibration Microphone and Genelec AutoCal™ function. The Sound Card is only active when AutoCal™ function is used.
GLM.SE™ Control Network	The GLM.SE™ loudspeaker control network is a proprietary network allowing the setting, reading and monitoring of loudspeakers and subwoofers on the GLM.SE™ network. System setup can be achieved very rapidly by simply opening a System Setup file, which causes all system and loudspeaker settings to be automatically communicated to all loudspeakers.
GLM.SE™ DSP Loudspeaker Manager Package	The GLM.SE™ control network delivery package containing all hardware and software to build a GLM.SE™ Loudspeaker Manager environment. 8130As and SE7261As are purchased separately.
GLM.SE™ DSP Multiroom Expansion Package	An expansion package providing a license and hardware to install the GLM.SE™ in multiple rooms within a single facility.
GLM.SE™ Main Page	The face of the GLM.SE™. This page is used to access all other functions of Loudspeaker Manager.
Network Interface / Sound card	The Network Interface is a USB device that connects the computer to the GLM.SE™ loudspeaker control network. The Genelec Sound Card is integrated in the Network Interface. The Network Interface translates communication between the computer and the control network, enabling a very large and physically long control network with multiple loudspeakers. The Network Interface isolates the private and confidential messaging with loudspeakers from any public data networks and from the functioning of the computer running the GLM.SE™ software.
GLM.SE™ System Setup Editor	This page is used to access more detailed sections of the GLM.SE™ including the Acoustical Settings Editor.

GLM.SE™ Software	GLM.SE™ is an abbreviation for the Genelec Loudspeaker Manager. This software enables setup and control of loudspeakers on the GLM. SE™ control network through the use of system setup files, and supports fully automated loudspeaker system setup.
Group	Loudspeakers or audio channels designated to play simultaneously.
ID Tone	A built-in tone in the SE7261A used to identify which loudspeaker is being communicated to.
IEC Mains Cable	A standard detachable mains cable used to apply mains electrical power to the loudspeaker or subwoofer.
Interactive Response Editor	Located in the Acoustical Settings Editor, this Editor allows for the interactive adjustment of a measured response using the Room Response Controls.
Loudspeaker	This term is used for loudspeakers that are not subwoofers. An 8130A Digital Input loudspeaker.
Manual Cabling Wizard	A self-guided Wizard that allows for more complicated and versatile System Setups not found in the Rapid Cabling Wizard.
Manual Controls	The user interface settings on a loudspeaker or subwoofer used when in stand-alone mode.
Microphone Holder	The rubber mounting hardware to attach the Genelec 8200A Calibration Microphone to a standard microphone stand.
MultiPoint	A method of spatial averaging used in AutoCal™ measurements, used when optimizing the Acoustical Settings.
Network Cable	A CAT5 cable with RJ45 connectors (type PC-to-HUB, straight not crossed wiring). This cable is also used as an Ethernet network cable. Network cables connects the Network Interface to the SE7261A subwoofer to form a network of devices that may be controlled using the GLM.SE™ software
Network Control Mode	The use of Genelec DSP loudspeakers with the GLM.SE™ software and the control network.
Rapid Cabling Wizard	The GLM.SE™ contains pre-made system setups of the most typical loudspeaker arrangements. Rapid Cabling makes system setup simple and fast by allows the selection of one of these presets.
Room Response Controls	A collection of controls used to modify the loudspeaker or subwoofer response in order to improve the in-room sound quality at the listening position.

SinglePoint	A measurement taken in the main monitoring position used by AutoCal™ when optimizing the Acoustical Settings.
Software CD	The CD-ROM containing the install files for Genelec Loudspeaker Manager and AutoCal™.
Stand-Alone Mode	The use of Genelec SE7261A subwoofer as an individual subwoofer, without the GLM.SE™ software and the control network.
Stored Settings	The settings stored inside a SE7261A subwoofer. These settings are used when the loudspeaker is operated in the stand alone mode
Subwoofer	An SE7261A subwoofer with 8 channel bass management.
System Setup File (.gse)	Files stored on the hard drive of a computer running the GLM.SE™. Loading a System Setup File in GLM.SE™ automatically sets up all loudspeakers in the system with stored monitoring Group definitions, audio cable definitions, defaults for monitoring levels and all acoustical alignment settings.
System Setup Wizard	System Setup Wizard guides the user through the process of setting up the GLM.SE™.
Third-party Volume Controller	A peripheral device (e.g. Griffin PowerMate) used to control the system volume.
USB Cable	A type A-B USB cable used to connect the Network Interface to a computer.

SYSTEM PARTS

The Genelec SE7261A/8130A loudspeaker system consists of

- Two-way 8130A Digital Input loudspeakers
- SE7261A Subwoofer
- GLM.SE™ DSP Loudspeaker Manager Package containing the user interface software with the Control Network Interface including the Genelec Sound Card and a factory calibrated acoustic measurement microphone for controlling the SE7261A subwoofer.
- GLM.SE™ DSP Multiroom Expansion Package

A basic working system requires only loudspeaker(s). See Getting Started.

8130A Loudspeaker Delivery Content

Contents of the Delivery Box

- Loudspeaker
- IEC Mains Cable
- 8130A Loudspeaker Operating Manual

SE7261A Subwoofer Delivery Content

Contents of the Delivery Box

- Subwoofer Loudspeaker
- IEC Mains Cable
- Network Cable
- SE7261A Subwoofer Operating Manual

GLM.SE™ DSP Loudspeaker Manager Package Delivery Content

The GLM.SE™ Genelec Loudspeaker Manager is a loudspeaker control networking system that offers capability to control all system parameters as well as the possibility for detailed acoustical alignment of every loudspeaker in the system. The use of the GLM.SE™ is warmly recommended. Genelec AutoCal™ provides the GLM.SE™ with a fully automated multi-loudspeaker system acoustical calibration capability and comes with a factory-calibrated measurement grade microphone, microphone amplifier and microphone holder.

Contents of the GLM.SE™ delivery box

- Software CD
- Genelec GLM.SE™ System Operating Manual
- Quick Connection Guide
- Network Interface with a built-in calibration microphone amplifier and Genelec Sound Card
- USB Cable
- Genelec 8200A Measurement Microphone
- Microphone Holder
- Measurement Signal Cable with 3.5 mm stereo plugs

GLM.SE™ DSP Multiroom Expansion Package Delivery Content

The GLM.SE™ software is sold with a site-license permitting installation into multiple rooms. The GLM.SE™ DSP Multiroom Expansion Package delivers a Network Interface and cables for installation into one additional room. Each additional room needs a multiroom expansion pack.

- Network Interface
- USB Cable

LOUDSPEAKERS

This section provides a rapid overview of Genelec GLM.SE™ loudspeakers. In-depth information about the loudspeakers is available at www.genelec.com and in the Operating Manuals supplied with the loudspeakers.

Two-way Loudspeakers (8130A)

The two-way 8130A loudspeakers accept both AES/EBU digital audio and analog audio through the same connector, however in this system only a digital signal is passed from the SE7261A.

Digital Audio Input

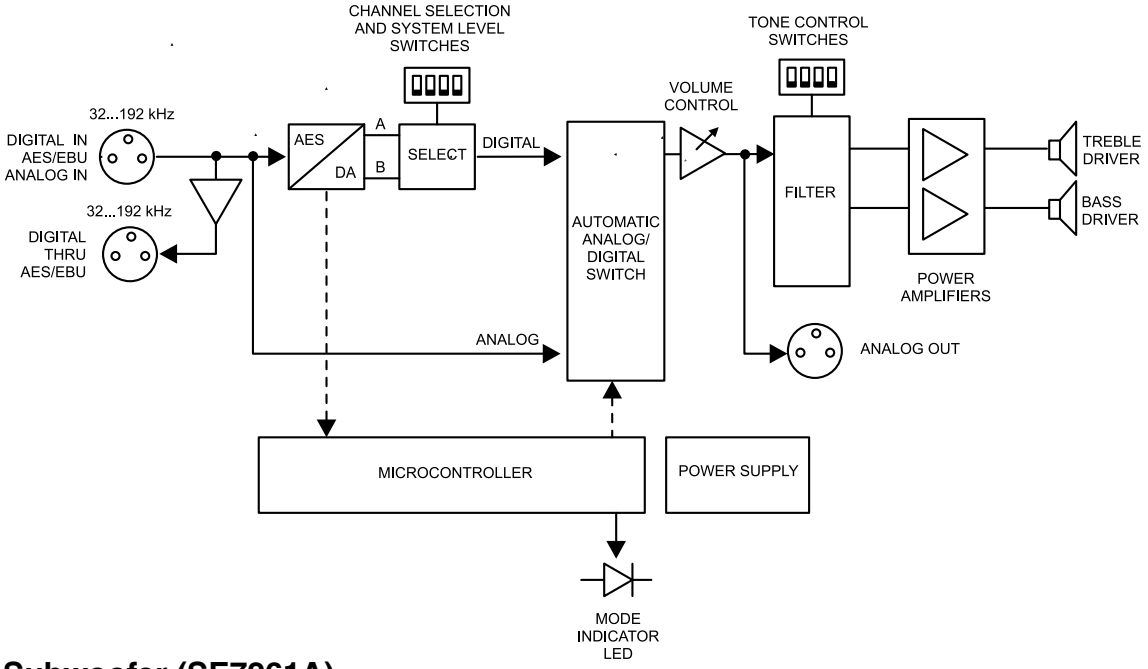
The digital input has a fixed sensitivity. Digital signals are represented relative to their maximum value, or Full Scale (FS) value. For example, -10 dBFS means that the digital audio signal level is 10 dB below the full scale or the maximum representable digital signal.

In the SE7261A/8130A System, the maximum theoretical audio level for a 0 dBFS digital audio input signal translates to 115 dB SPL at 1 m sound pressure level. For example, a signal having -36 dBFS level produces a sound level of 79 dB SPL at 1 m. This is a technical specification of the loudspeaker, and the Genelec Loudspeaker Manager GLM.SE™ can adjust the monitoring volume down from this level.

Digital audio sample rate can vary from 32 kHz to 192 kHz and word length from 16 to 24 bits. Only single wire-dual channel is supported.

Two-Way Loudspeaker Functional Blocks

All audio enters audio input stage where all crossover and filtering takes place. The audio outputs go via digital-to-analog conversion to built-in power amplifiers and on to the tweeter and woofer drivers. The loudspeakers have built-in user interfaces with switches and a rotary level control on the front of the loudspeaker.



Subwoofer (SE7261A)

Digital Audio Input

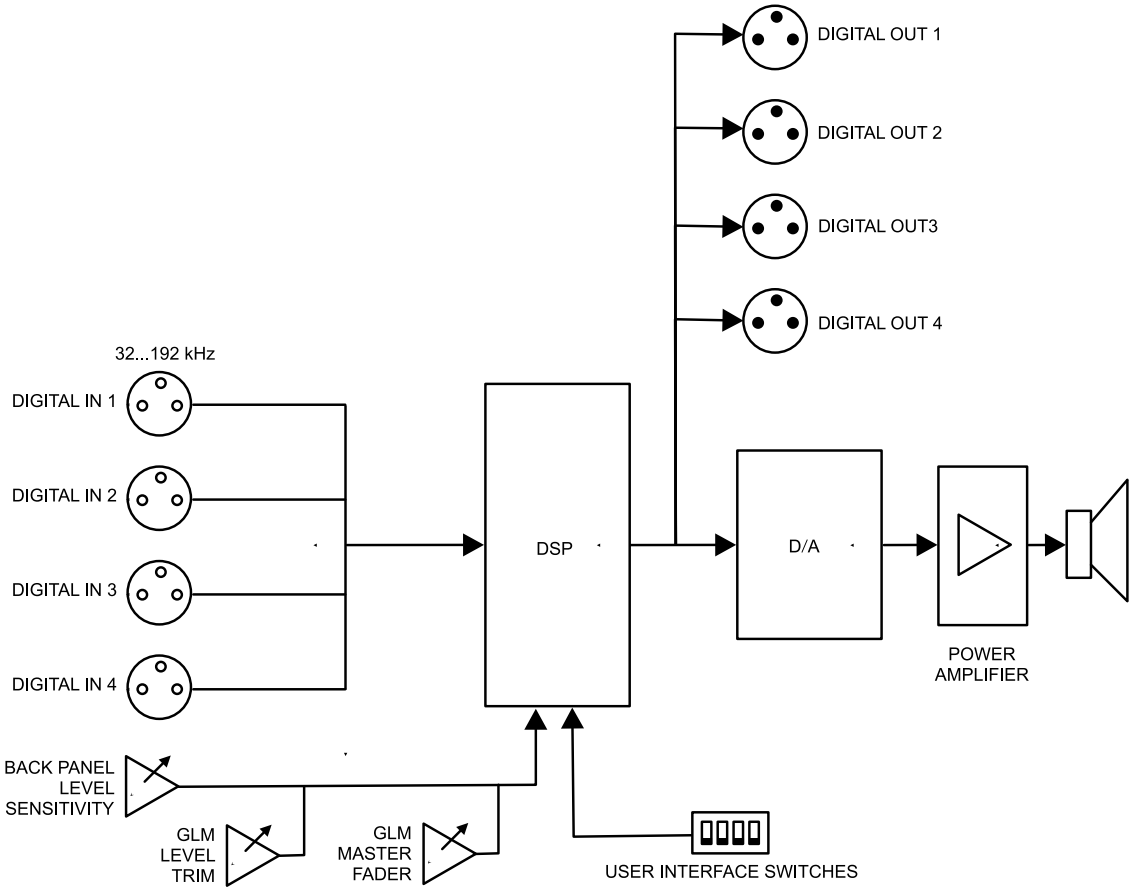
The digital input has a fixed sensitivity. Digital signals are represented relative to their maximum or Full Scale value. For example, -10 dBFS means that the signal level is 10 dB below the full scale or the maximum representable digital signal.

In Genelec SE7261A subwoofers, the maximum audio level of 0 dBFS translates to the theoretical 115 dB SPL at 1 m sound pressure level. For example, a -36 dBFS signal produces a sound level of 79 dB SPL at 1 m. Genelec Loudspeaker Manager GLM.SE™ adjusts the monitoring volume down from this level.

Digital audio sample rates can vary from 32 kHz to 192 kHz and word length from 16 to 24 bits. Single-Wire formats are only supported. Note that there may be a valid AES/EBU signal although the signal is silent.

Subwoofer Functional Blocks

The subwoofers have AES/EBU digital audio inputs only. There are no analog audio inputs. All audio enters the DSP processor, where all signal processing takes place. The output goes via digital-to-analog conversion to the built-in power amplifier and driver. High pass outputs are delivered via AES audio to the 8130As. The subwoofer has a built-in user interface with switches and rotary controls and a connection to the Genelec Loudspeaker Manager network enabling centralized management of up to 8 loudspeakers and 1 subwoofer in one installation.



PLACING LOUDSPEAKERS IN THE MONITORING ROOM

Here is a quick introduction to monitoring loudspeaker placement.

- Place the loudspeakers in their expected positions before cabling anything.
- For most applications, the two-way 8130A loudspeakers should be located within 1.7-2.5 meters (5-8 ft.) of the primary listening position.
- Attempt to place all loudspeakers at ear height for the person in the primary listening position. If a loudspeaker is higher than ear height, tilt and turn the loudspeaker toward the listening position. Genelec two-way loudspeakers feature a vibration-isolating monitor stand, the IsoPod™, which enables the positioning of the loudspeaker towards to the primary listening position.
- Aim the acoustic axis of all loudspeakers towards the main listening position both horizontally (turn towards the listening position) and vertically (tilt towards the listening position).
- Position subwoofer close to the wall(s).
- Remember that all audio cables must go to the subwoofer first and then to the loudspeakers. Make sure that enough cable length is available to move the subwoofer around the room to find a location of optimal performance.

The following sections provide more detailed information about placing loudspeakers in a monitoring environment.

Full-Bandwidth Loudspeaker Placement

Minimum Distance From a Wall Behind a Loudspeaker

Genelec two-way 8130A loudspeakers should be placed so that a minimum distance of 5 cm (2”) is left behind the loudspeaker for amplifier cooling and rear opening reflex port sound radiation.

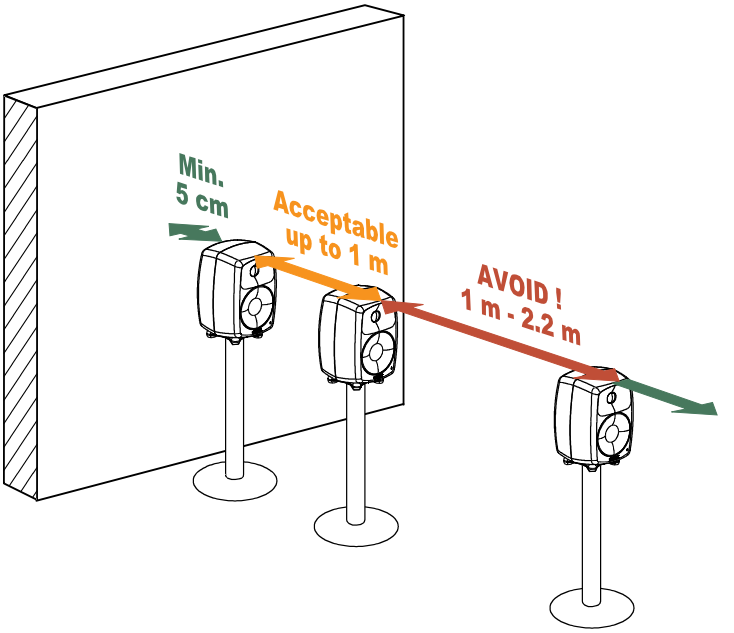
Low Frequency Cancellations

In general, when a loudspeaker’s front baffle is more than 0,3 meters (1 foot) away from the wall behind the loudspeaker, a reflection from this wall can cause a cancellation of low frequencies and hence reduction of bass output. For two-way loudspeakers, low frequency cancellations in the 40 – 80 Hz frequency range should be avoided. Cancellations in the 80 - 200 Hz range should also be avoided if possible.

Recommended Distances

Translating this into distance recommendations shows that loudspeakers can be placed close to a wall at a distance less than 1 meter (3 ft.). Distances between 1 and 2.2 meters (3-7 ft.) should be avoided.

Loudspeakers placed more than 2.2 meters (7 ft.) away from walls may suffer from cancellations around the low frequency cut-off of the loudspeaker limiting low frequency bandwidth. As a rule of thumb, the



Recommended distances from a single wall to the front baffle of free-standing loudspeakers. Correct (green), acceptable (orange) and not recommended (red).

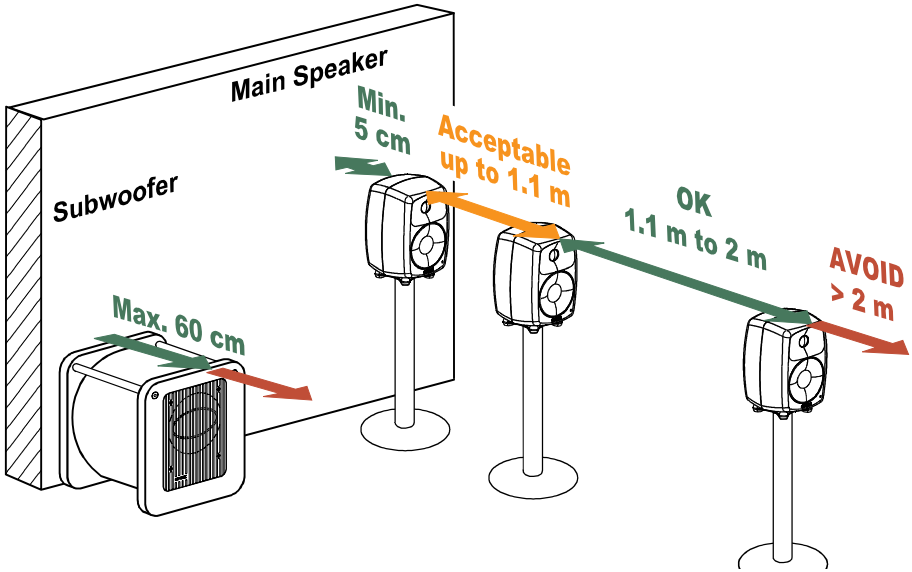
lower the low frequency cut-off the further away the loudspeaker must be placed from the wall in order to avoid this phenomenon.

Distances to the ceiling and other walls may be shorter than the distance to the wall behind a loudspeaker. Reflections from these surfaces may be important and should also be considered.

Subwoofer Placement

Subwoofers can make life much easier in producing high quality low frequency energy. When a subwoofer is used, the loudspeakers can be placed more freely, thereby allowing more flexibility in finding a good location in the room for the reproduction of low frequencies.

A subwoofer should be placed close to a wall, preferably closer than 0.6 meters (2 ft.) from a wall. This placement eliminates most possible cancellation sources and the subwoofer response remains flat and well loaded.



Recommended distances from a single wall to the front baffle of loudspeakers combined with subwoofer(s). Correct (green), acceptable (orange) and not recommended (red).

Using a subwoofer provides an additional crossover frequency (typically at 85 Hz). This makes placing loudspeakers much easier. Acceptable distances extend to 1.1 m because of the low frequency cut-off of loudspeakers. Loudspeakers may be placed between 1.1…2 m without serious compromises due to the wall behind the loudspeaker causing serious cancellation effects.

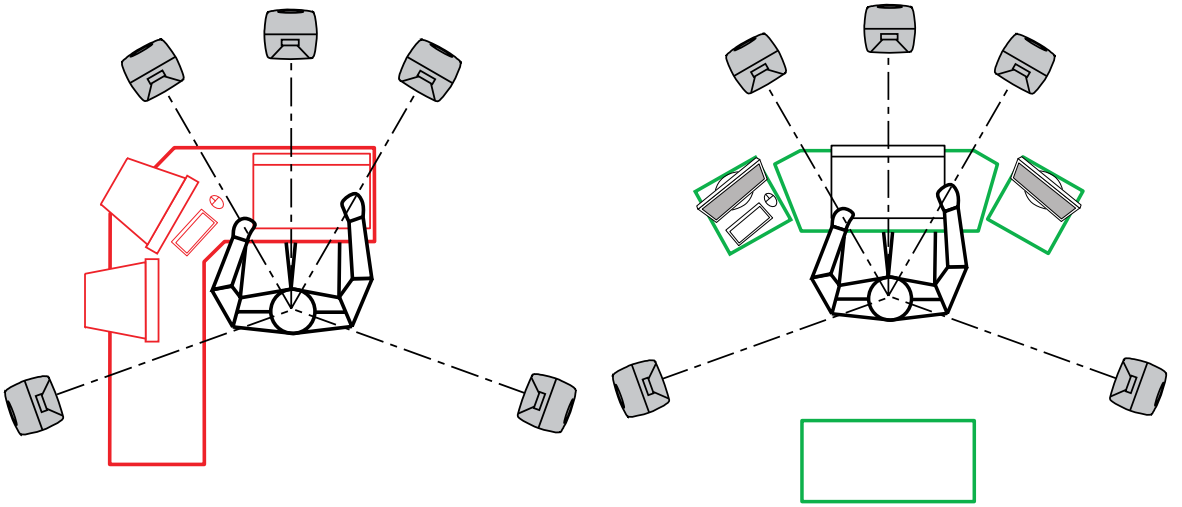
Although Genelec subwoofers provide accurate phase control at the crossover point, loudspeakers should not be placed further than 2 m (7 ft.) from a supporting subwoofer. Larger distance differences may cause tonal balance differences around the crossover frequencies due to loudspeakers and subwoofer(s) exciting different room modes.

Multi-Channel System Layout

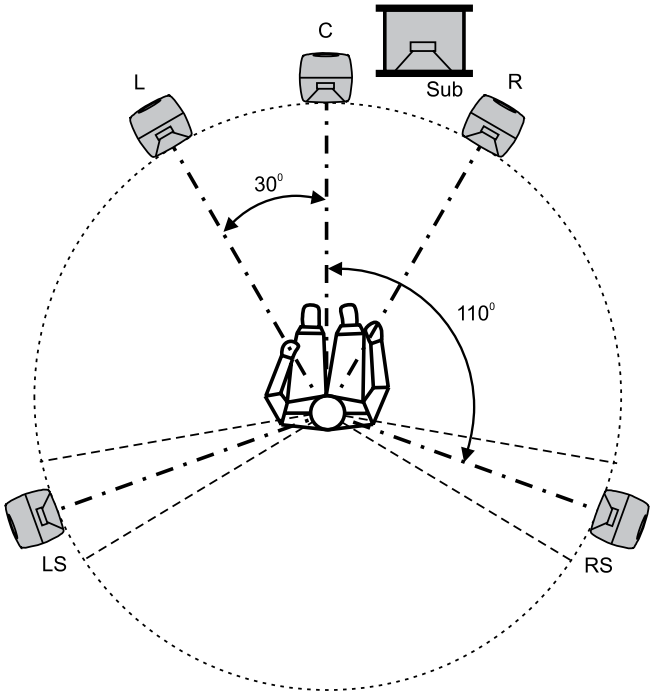
The positioning of tables, screens, racks, etc, is critical in order to maintain accurate imaging. Early reflections can smear the sound image and compromise localization. To avoid this, reflecting surfaces between loudspeakers and the listening position should be minimized. Symmetrical positioning of equipment is essential. Even with symmetry, reflecting surfaces should be removed from the vicinity of acoustic paths.

Front Loudspeaker, Multi-Channel Layout

For multi-channel audio the Left and Right loudspeakers should be placed 60 degrees apart, with the Center loudspeaker in the middle. All loudspeakers should be of the same type so there are no coloration changes when panning sounds across the front stage.



Left figure: Example of non-symmetrical layout producing reflections from computer screens and table surface totally different for different loudspeakers. This situation creates front-back and left-right localisation smearing. Right figure: Symmetrical layout minimizes reflection surfaces and maintains accurate localisation because reflections are similar due to symmetry.



Recommended loudspeaker positioning for 5.1 multi-channel audio reproduction.

Surround Loudspeakers

Surround loudspeakers should be placed in a positional window between ±100 to ±120 degrees from the centerline. If more than two loudspeakers are used an equal number of loudspeakers should be placed symmetrically on both sides of the center line, on a circle between ±60 to ±150 degrees. Most recording engineers choose ±110…130-degree position for a surround stereo pair.

System Location In the Room

It is important that the multi-channel installation is symmetrically located in the room. Reflections created by boundaries should be identical from left to right so that spatial information and panning of sources remains stable. It is also recommended that the listening position be located in the front half of the room so that the direct sound level is maximized relative to the reverberant energy in the room.

Aiming of Acoustical Axis

All loudspeakers should be aimed towards the engineer's listening position.

GETTING STARTED

Quick Course to System Basics

Control network and audio cabling are separate. The first observation to be made is that audio signals and control information travel along different cables. This has the inherent advantage of allowing one to operate the system with the control network (known as the network control mode) or without the control network if so desired (known as the stand-alone mode).

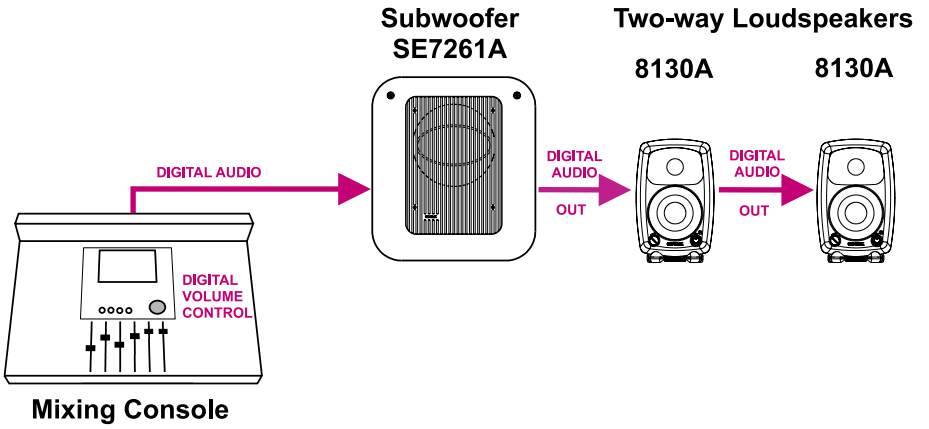
When using the Genelec loudspeaker control network, full control to all features in a loudspeaker become available. Attaching the control network automatically puts the system in the network-controlled mode.

Digital Audio

8130A active loudspeakers and SE7261A subwoofers have AES/EBU digital audio inputs. Run the AES/EBU audio cable(s) to the subwoofer first, then onto the main loudspeakers. The AES/EBU cable carries two digital audio channels, run another cable from the “Thru” output of the loudspeaker to the input of the next loudspeaker.

If the audio source has a volume control for the AES/EBU digital audio, it can be used to control the monitoring level.

If the AES/EBU outputs are fixed level line-outs, various volume controls options are available in the GLM. SE™ loudspeaker control software.

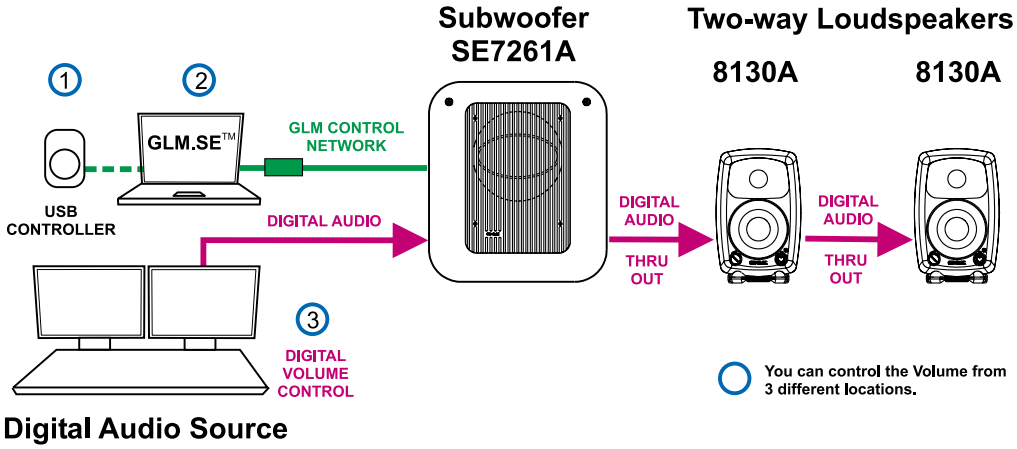


The GLM.SE™ software provides several volume control faders on the computer display. These volume controls can be used in the same computer running audio processing or recording software.

Third-party volume control knobs (for example Griffin PowerMate) that attach to a USB interface can also be used to control the monitoring level through the GLM.SE™ software and the Genelec loudspeaker control network.

Stand-alone mode refers to using the SE7261A subwoofer without the GLM.SE™ Control Network.

When calibrating the 8130A two-way loudspeakers one can select to use the same switch-based acoustic alignments that can be found on the analog loudspeakers, or to use a much more versatile set of room response controls available through the GLM.SE™ loudspeaker control software or both.



The GLM.SE™ software supports Windows XP Professional as well as Vista Professional. Apple MacIntosh is supported in OS, Panther, Tiger OSX, and Leopard OSX. The Network Interface connects the computer to the SE7261A. Using the GLM.SE™ software provides full access to all room response controls. After aligning the system acoustically, it is possible to store these settings in the GLM.SE™ software Setup File or inside the SE7261A memory.

Step-By-Step System Setup for GLM.SE™ Control Network Use

The Genelec GLM.SE™ DSP System uses a networking concept for controlling a multi-channel system. A control network cable is provided with all Genelec GLM.SE™ systems.

To setup quickly, follow the steps detailed below. For further information consult the sections of this manual mentioned in each step.

- Unpack and position the loudspeakers. See the “Loudspeaker Placement” section for details.
- Find the Genelec Control Network cables in the SE7261A delivery box. Connect the control network. See the “Genelec control network cabling” section for details.
- Find the Network Interface and follow cabling instructions. See the “GLM.SE™ Network Interface Device” section for details.
- Label and connect the audio cables. See the “Audio Cabling” section for details.
- Launch GLM.SE™, then follow the on-screen instructions to complete a System Setup. Select either Rapid Cabling Mode or Manual Cabling Mode and follow the instructions.
- Select the appropriate Rapid Cabling preset in the GLM.SE™ and launch the Rapid Cabling Wizard. See the “Rapid Audio Cabling” section for details.
- To acoustically align the system, run the Acoustic Setup Wizard in the GLM.SE™. See the “Acoustic Setup Wizard” section for details.
- Congratulations! Setup is now complete!

A more detailed system setup procedure can be found in the section describing the System Setup Wizard.

Step-By-Step System Setup for Stand-Alone Use

Stand-Alone Use

Genelec DSP loudspeakers can be used like any other loudspeaker system, without the GLM.SE™ control network. This is known as stand-alone use.

- Note that when a 8130A loudspeaker detects a valid AES/EBU word clock, the system will sync and run in the digital input mode.
- DSP subwoofers only have digital audio inputs and can be used in stand-alone mode running AES/EBU-digital audio.
- For more information on setting up and using loudspeakers in stand-alone mode, see the section on stand-alone operation.

GENELEC LOUDSPEAKER MANAGER GLM.SE™

Overview

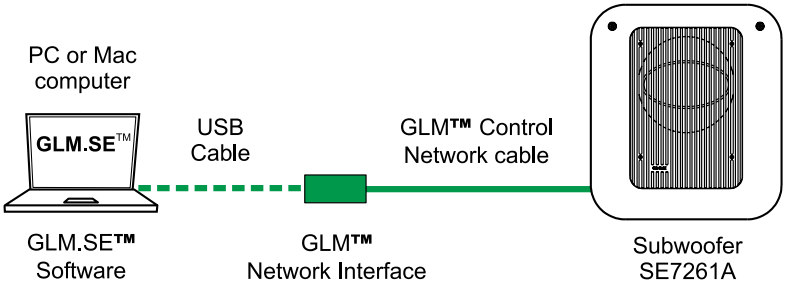
The Genelec Loudspeaker Manager GLM.SE™ is the control software for Genelec DSP loudspeaker systems. The GLM.SE™ runs on a personal computer.

The GLM.SE™ knows when an SE7261A subwoofer is present on the control network and provides access to all settings and system level controls.

The GLM.SE™ connects solely to a single SE7261A and offers control of everything within the subwoofer's DSP. This includes controls built into the high and low pass outputs as well as full system controls including monitoring volume, mute/solo for audio channels, audio channel Group selection and more.

All settings can be collectively stored into the computer as a System Setup File. Loading a System Setup File recalls all system level settings and sets all settings for all loudspeakers, including acoustic calibration.

Using the GLM.SE™, all acoustic settings can also be stored into the SE7261A for stand-alone use.



The basic structure of a GLM.SE™ Control Network has the following components

- Computer running the GLM.SE™ software.
- One USB port of the computer connected to the Network Interface.
- The Network Interface.
- Network cable connected to the SE7261A subwoofer.

GLM.SE™ software communicates only with the SE7261A subwoofer. All digital signal processing controlled by GLM.SE™ software is contained in the SE7261A.

GLM.SE™ Control Network

Network Interface Device with Genelec Soundcard

The Network Interface serves as the communicator between the SE7261A on the control network and the computer. Attach the Network Interface to a USB port. The device driver is installed automatically. The Genelec Soundcard is automatically enabled only when AutoCal is run.

The USB cable runs from the computer to the Network Interface. Once the Network Interface is connected to the computer flashing lights on the interface indicate that the network is active. If no communication lights are flashing, check that the control network cable and the USB cable are securely attached and the GLM.SE™ software is running.

The GLM.SE™ network runs on a CAT5 cable. These are the same cables that are used for Ethernet. Instead of using Ethernet for communication with the SE7261A, Genelec uses a proprietary protocol defining the method of communication between the SE7261A and the Network Interface that connects to the USB port on the computer.

There are several important reasons why a USB interface is used instead of, for example, the Ethernet. This keeps the network running at all times, even if the computer crashes. The Network Interface acts as the master controller on the network, and communicates to all aspects of the SE7261A, even if the computer is rebooting.

The Genelec network uses a proprietary communication protocol to ensure integrity of communication to and from the SE7261A. The Network Interface is used as a translator between the Genelec control network and any computer hardware using it. This ensures that loudspeaker control traffic remains insulated and secured from any public networks. This is necessary because of the possibility of congestion on public networks (loudspeaker control messages do not get through), and in order to limit the range of access (outsiders on a public network could possibly control the loudspeakers).

The USB interface is ubiquitous in the computer world. A USB cable run is normally limited to 5 m (15 ft.), but this is not a problem. The computer network cable from the Network Interface can extend to any practical distance needed. If the Network Interface cannot be placed close the computer the USB cable can be extended with actively buffered cables up to 25 meters (75 ft.) in length.

Note

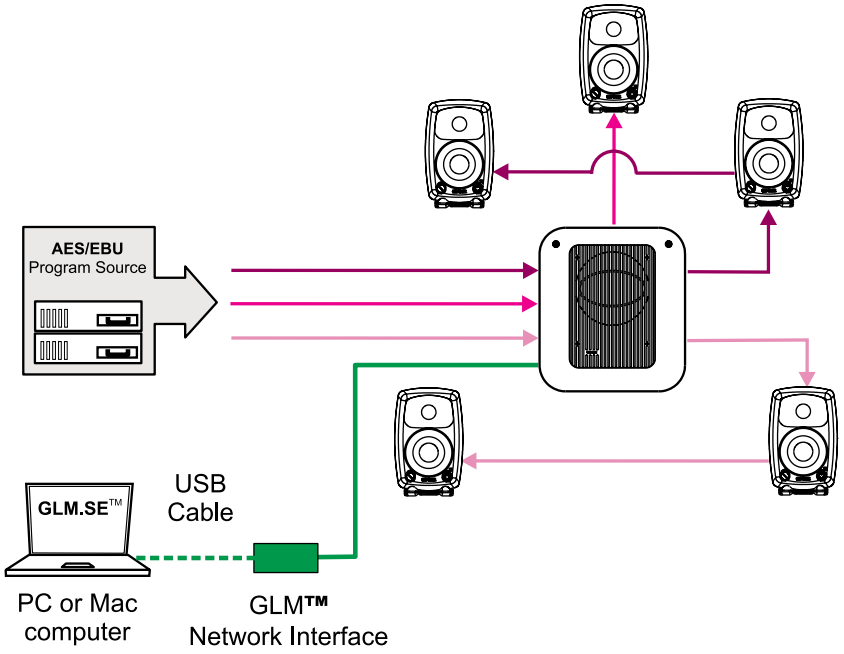
If the Network Interface is disconnected or the computer is powered down, the GLM.SE™ software will no longer control the SE7261A. In that event, the system maintains its current settings until the subwoofer is powered down or the “STORED” dip switch on the SE7261A is moved.

When the loudspeakers are re-powered and the GLM.SE™ software is not controlling the network, the SE7261A subwoofer obtains acoustic settings based either on the user interface controls on the subwoofer (manual controls) or from its internal memory (stored settings). This choice is determined by the position of the switch marked “STORED/MANUAL CTRL” on the SE7261A connector panel.

GLM.SE™ Control Network Cabling

Control comes from the computer running the GLM.SE™ software. The computer connects to the Network Interface via the USB port (a 1.5-meter USB cable is provided). The Network Interface connects onwards to the SE7261A using the provided network cable. No other network connections are needed since the SE7261A does all the DSP processing.

Consider an example with five 8130A loudspeakers and one SE7261A subwoofer. The digital audio uses AES/EBU cabling where each physical audio cable carries two channels of digital audio. All audio cables run to the subwoofer first and then to the 8130A loudspeakers. The GLM.SE™ Control Network starts from the USB port of the system-controlling computer, runs through the Network Interface and onwards to the SE7261A.



Installing the GLM.SE™ Software

Windows
Insert the software CD in the CD-ROM drive. The installation application will open automatically (if autorun is disabled then the Install.exe file must be manually launched from the CD). Click 'Install GLM.SE™ software' button to launch the installation. To finish the installation the system needs to be restarted.

Macintosh
Open GLM.SE™ CD with Finder and select the software version that matches the OS X version (Panther, Tiger, or Leopard) to be used and launch that package. To finish the installation the system will be restarted. Macintosh installation package will always install X11 application from the CD. If X11 application already exists in the system, use customized installation type to remove X11 from the installation task.

Running the System Setup Wizard

The System Setup Wizard is a self-guiding program designed to make the installation process easy and complete. The basic flow of setting up the system is detailed below. Consult the sections of this manual mentioned in each step for further details. Before running the System Setup Wizard, make sure that all audio source equipment output levels are turned down.

- Position the 8130A loudspeakers. See the "Loudspeaker Placement" section for details.
- Find the Genelec Control Network cable in the SE7261A delivery box. Connect the control network. See the "Genelec control network cabling" section for details.
- Find the Network Interface Device and follow cabling instructions. See the "Network Interface Device" section for details.
- Find the software CD in the Genelec Loudspeaker Manager package, insert it in computer and follow on-screen instructions to install Genelec Loudspeaker Manager GLM.SE™ on the computer. See the "GLM.SE™ Genelec Loudspeaker Manager" section for details.
- Label and connect the audio cables. See the "Audio Cabling" section for details.
- Launch the GLM.SE™, then follow the on-screen instructions to complete a System Setup. Select either Rapid Cabling Mode or Manual Cabling Mode and follow the instructions.
- If there is no applicable Rapid Cabling Preset, select the Manual Cabling Wizard. See the "Manual Audio Cabling" section for details. Plan all cabling according to the guidelines provided. Plan channel labeling and loudspeaker labeling and launch the Manual Cabling Wizard.
- To acoustically align the system, run the Acoustic Setup Wizard in the GLM.SE™. See the "Acoustic Setup Wizard" section for details.
- Use the fully automated alignment system AutoCal™ built into the Acoustic Setup Wizard.
- Finally Save the System Setup and study the basic use of the GLM.SE™.

Once the network cabling is complete, turn on all the loudspeakers. From the computer, launch the Genelec Loudspeaker Manager by clicking on the Genelec Loudspeaker Manager icon.

AUDIO CABLING

Always plan your audio cabling and label the cables before connecting them and running the System Setup Wizard. It is suggested that the digital audio cables are labeled using the following convention: “AES/EBU Channel number and Sub-frame – Loudspeaker location.” For example: “AES/EBU 1A – Front Left”

XLR Connector Pin Assignments for AES/EBU Signals

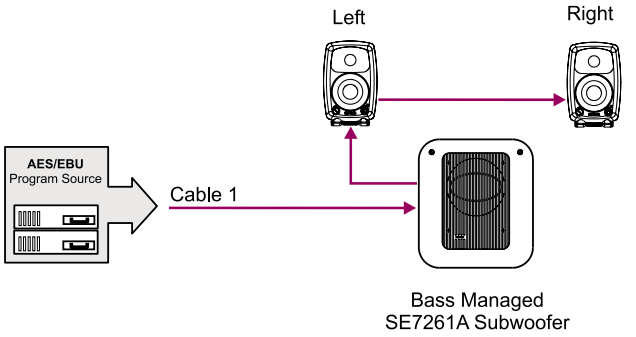
For digital applications cables specifically designed to carry high-speed digital audio should be used. This cable should have 110-ohm characteristic impedance. Do not use standard microphone cable intended for analog signals, as it does not have good performance for digital audio applications and may result in poor digital audio performance, especially for longer cable runs.

The inputs will sync for sample rates from 32 kHz to 192 kHz Single-Wire signals. Since AES/EBU audio is typically transmitted in audio channel pairs (Channel A and B), connections will have to be made from one loudspeaker to another. This is accomplished via the output connectors in the SE7261A subwoofer and by daisy-chaining the 8130As using the THRU connector on the back of the loudspeakers. Typical pairing in a two-channel stereo AES/EBU bit-stream has the Left audio channel carried in the AES/EBU sub-frame A and Right audio channel carried in the AES/EBU sub-frame B. The digital audio cable can go to either loudspeaker first. Select which sub-frame to reproduce by manually selecting Channel A or B on the back of the 8130A loudspeaker.

MAKE SURE ALL AUDIO CABLES ARE LABELED BEFORE STARTING THE CABLING PROCEDURE!

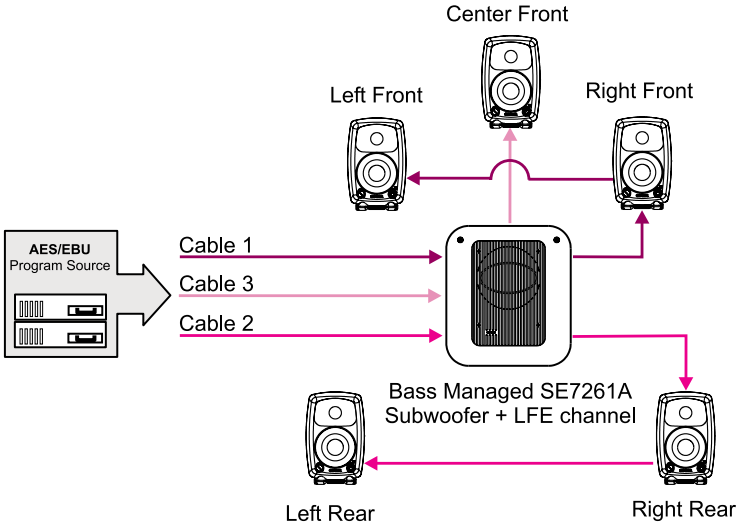
Stereo Setups

Digital audio cabling MUST go from source to the SE7261A subwoofer first, then to the 8130As, to either loudspeaker first, then on to the next using the THRU connector. Freely connect to either loudspeaker first.



5.1 Multi-Channel Setup

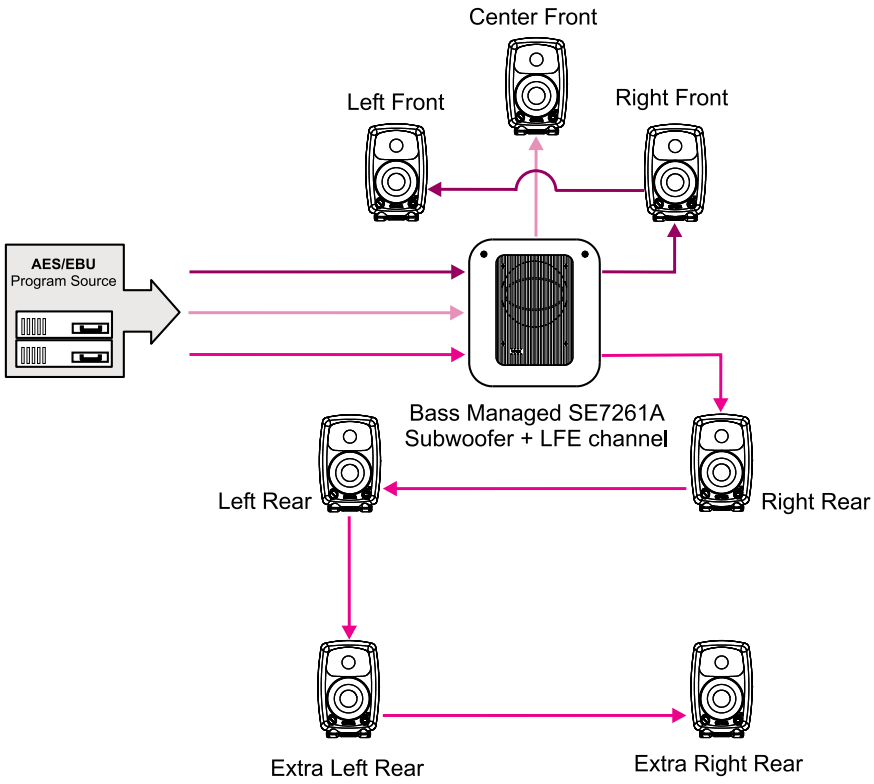
A 5.1 multi-channel setup carries six channels of audio. They are the Left Front, Right Front, Center Front, Left Rear, Right Rear, and LFE channels. The LFE channel is a bandwidth-limited low frequency effects channel. To reproduce such a 5.1 setup, one subwoofer and five loudspeakers are normally used.
All digital audio cables must run to the subwoofer first. The SE7261A DSP subwoofer uses AES/EBU input number 4 as the LFE input.



Duplicating Loudspeakers

It is also possible to daisy-chain digital audio signals to additional loudspeakers. One such application might be a movie mixing room where multiple loudspeakers must reproduce the rear and side channel signals.

In the example below the Left Rear and Right Rear loudspeakers have been duplicated. The system is built simply by daisy-chaining the AES/EBU cable out from one loudspeaker to the next unit until all loudspeakers have been connected. Be sure that the proper DIP Switch for channel reproduction is ON for each of the 8130As.



GLM.SE™ Rapid Cabling Presets

The Rapid Cabling Presets help speed up the System Setup by quick identification of the speakers and reduced text entries. The most common loudspeaker setups seen in listening rooms have been included with the Rapid Cabling Presets.

Table of Rapid Cabling Presets

Type of signal	Audio channel layout	Rapid cabling option	Support for LFE channel
AES/EBU single-wire	2.0	Stereo Pair with Subwoofer	No
AES/EBU single-wire	5.1	5.1 Surround System with Subwoofer	Yes
AES/EBU single-wire	6.1	6.1 Surround System with Subwoofer	Yes
AES/EBU single-wire	7.1	7.1 Surround System with Subwoofer	Yes

Here is a brief list of instructions on how to complete the Rapid Cabling Wizard.

- Before starting the GLM.SE™, identify in the Rapid Cabling Preset Table shown above, the description that matches the desired loudspeaker setup. Then, find the corresponding section below and study the cabling layout description and the AES sub-frame assignment table.
- At the sound source (mixing console, audio workstation, etc.) assign audio signals to the AES/EBU outputs according to the table provided in each Rapid Cabling System Description.

- Connect audio cables according to the description and the cable wiring diagram in the Rapid Cabling System Description. BE SURE TO MANUALLY SWITCH EITHER CHANNEL A OR B ON THE BACK OF EACH 8130A ACCORDING TO WHATEVER SUB-FRAME OF AES AUDIO YOU WISH THAT SPEAKER TO REPRODUCE.
- Connect the GLM.SE™ Control Network cabling.

- Start the GLM.SE™ and proceed to the System Setup Wizard. Select the Rapid Cabling Wizard. Then select the Rapid Cabling System Preset in the drop-down box.
- If the system is properly connected and loudspeakers turned on, an ID Tone is briefly turned on from output 1A. In all cases of rapid cabling, this should be the Left 8130A. Once the match is confirmed press “Next”. Repeat the procedure until all the 8130As have been identified.
- Press “Next”. The System Audio Connections page is shown. This provides a list of audio

channels and the loudspeakers that are connected to those channels. Press “Finish” if all entries match.

- Use “File | Save As…” to name the System Setup that has just been created. Press “File | Save” to save with the current name into the Default Folder locations provided by the GLM software install.

It is strongly suggested that the Acoustical Setup Wizard is now used to acoustically align the loudspeaker system. On the following pages each of the Rapid Cabling Presets are presented in more detail along with an easy-to-follow graphic.

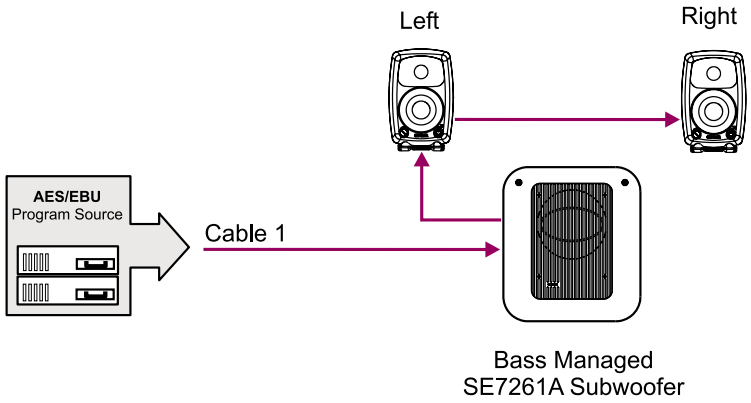
Stereo Pair with Subwoofer (AES/EBU Single-Wire)

Description. This Rapid Cabling Preset has one AES/EBU cable that carries both the Left and Right audio channels.

AES/EBU Sub-Frame Assignments. Sub-frame A carries the Left audio channel. Sub-frame B carries the Right audio channel. Be sure the proper DIP switch is turned ON for each 8130A.

Cabling. Run one AES/EBU cable from the source to the subwoofer, then from the output of the subwoofer having the same number as the input to the digital audio inputs of the Left and Right loudspeakers (the order of cabling the loudspeakers is irrelevant).

Groups. The pre-assigned Groups are Stereo, Left, and Right.



Cable number	Sub-frame DIP Switch ON	Audio channel	Subwoofer Input Connector	8130A Input Connector
1	A	Left	AES/EBU input 1	Digital in
1	B	Right	AES/EBU input 1	Digital in

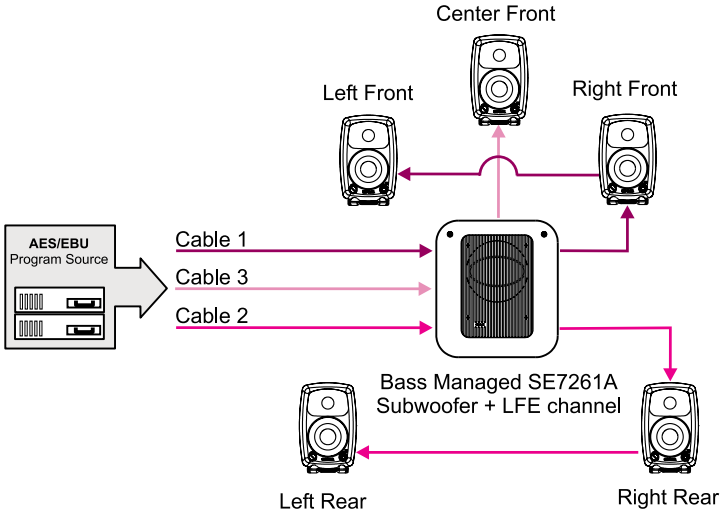
5.1 Surround System with Subwoofer (AES/EBU Single-Wire)

Description. This Rapid Cabling Preset utilizes three AES/EBU cables to carry 5.1-audio. “5.1” refers to having five full-bandwidth audio channels and an LFE channel. All three cables run to the subwoofer first, then from the subwoofer to the five loudspeakers.

AES/EBU Sub-Frame Assignments. The AES/EBU digital audio cables are numbered one to three. The AES/EBU sub-frame assignments and connectors to be used with the subwoofer and loudspeakers are provided in the table below.

Cabling. Run three AES/EBU cables from the source to the subwoofer AES/EBU inputs 1, 2 and 4. Subwoofer input number 3 is not used. Run the cables from the subwoofer AES/EBU outputs 1, 2 and 4 to the digital audio inputs of the loudspeakers. The cable that carries the LFE channel must be connected to the subwoofer input number 4.

Groups. The pre-assigned Groups are Surround, Stereo, and Rears.



Cable number	Sub-frame DIP Switch ON	Audio channel	Subwoofer Input Connector	8130A Input Connector
1	A	Left Front	AES/EBU Input 1	Digital in
1	B	Right Front	AES/EBU Input 1	Digital in
2	A	Left Rear	AES/EBU Input 2	Digital in
2	B	Right Rear	AES/EBU Input 2	Digital in
3	A	Center Front	AES/EBU Input 4	Digital in
3	B	LFE	AES/EBU Input 4	--

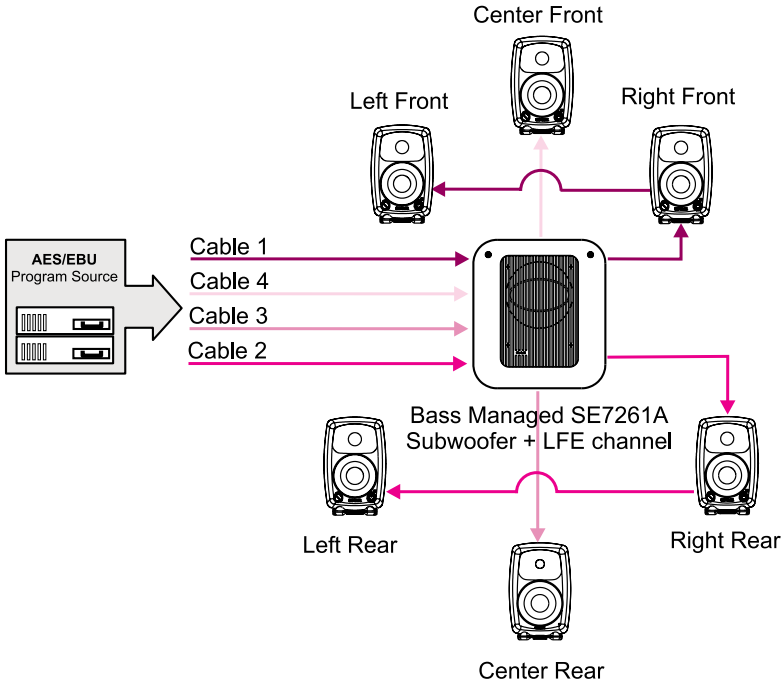
6.1 Surround System with Subwoofer (AES/EBU Single-Wire)

Description. This Rapid Cabling Preset utilizes four AES/EBU cables to carry “6.1-audio”. “6.1” refers to having six full-bandwidth audio channels and an LFE channel. All cables run to the subwoofer first, then from the subwoofer to the six loudspeakers.

AES/EBU sub-frame assignments. The AES/EBU digital audio cables are numbered one to four. The AES/EBU sub-frame assignments and connectors to be used with the subwoofer and two-way loudspeakers are provided in the table below.

Cabling. Run four AES/EBU cables from the source to the subwoofer AES/EBU inputs 1, 2, 3 and 4. Run the cables from the subwoofer AES/EBU outputs 1, 2, 3 and 4 to the digital audio inputs of the loudspeakers. The cable that carries the LFE channel must be connected to the subwoofer input number 4.

Groups. The pre-assigned loudspeaker Groups are Surround, Stereo, and Rears.



Cable number	Sub-frame DIP Switch ON	Audio channel	Subwoofer Input Connector	8130A Input Connector
1	A	Left Front	AES/EBU Input 1	Digital in
1	B	Right Front	AES/EBU Input 1	Digital in
2	A	Left Rear	AES/EBU Input 2	Digital in
2	B	Right Rear	AES/EBU Input 2	Digital in
3	A	Center Rear	AES/EBU Input 3	Digital in
3	B	Not used	Not used	--
4	A	Center Front	AES/EBU Input 4	Digital in
4	B	LFE	AES/EBU Input 4	--

7.1 Surround System with Subwoofer (AES/EBU Single-Wire)

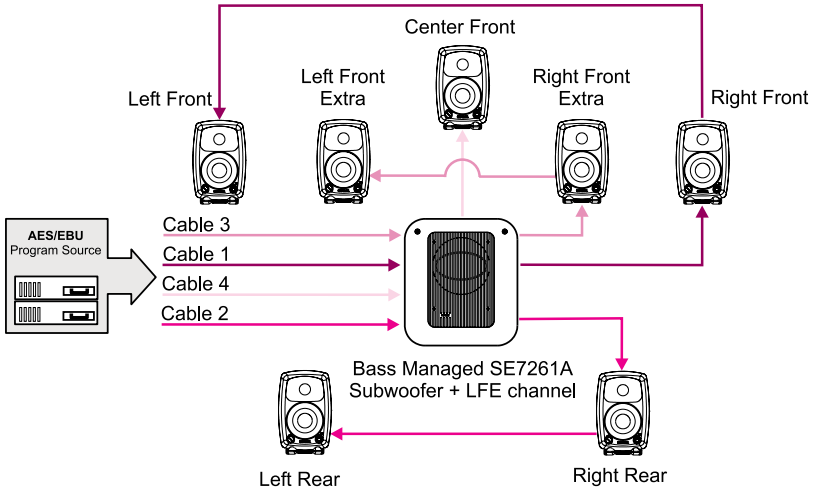
Description. This Rapid Cabling Preset uses four AES/EBU cables to carry 7.1 audio. 7.1 refers to seven full-bandwidth audio channels and an LFE channel. All cables run to the subwoofer first, then from the subwoofer to the seven loudspeakers.

In this system there are either:

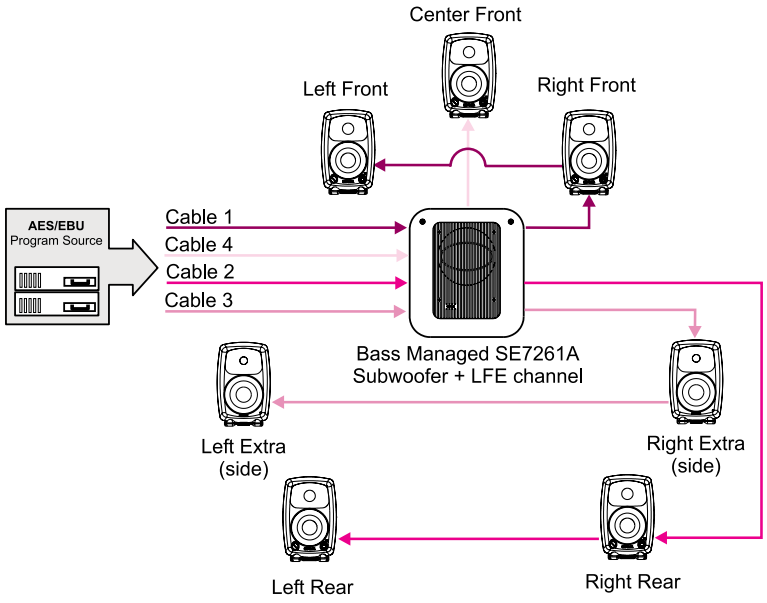
- SDDS System: five loudspeakers in the front (L, C, R, L Extra, R Extra), two loudspeakers in the rear (L rear, R rear) and the LFE Low Frequency Effects channel reproduced by the subwoofer
- HD Systems: three loudspeakers in the front (L,C,R), two loudspeakers in the side (L Extra, R Extra), two loudspeakers in the rear (L rear, R rear) and the LFE Low Frequency Effects channel reproduced by the subwoofer

AES/EBU sub-frame assignments. The AES/EBU digital audio cables are numbered one to four. The AES/EBU sub-frame assignments and connectors to be used with the subwoofer and two-way loudspeakers are provided in the table below.

Groups. The pre-assigned loudspeaker Groups are Surround, Stereo, and Rears.



Cabling in a 7.1 SDDS system



Cabling in a 7.1 HD system

Cable number	Sub-frame DIP Switch ON	Audio channel	Subwoofer Input Connector	8130A Input Connector
1	A	Left Front	AES/EBU Input 1	Digital in
1	B	Right Front	AES/EBU Input 1	Digital in
2	A	Left Rear	AES/EBU Input 2	Digital in
2	B	Right Rear	AES/EBU Input 2	Digital in
3	A	Left Extra	AES/EBU Input 3	Digital in
3	B	Right Extra	AES/EBU Input 3	Digital in
4	A	Center Front	AES/EBU Input 4	Digital in
4	B	LFE	AES/EBU Input 4	--

Custom Audio Cabling

If the chosen loudspeaker arrangement or audio channel cabling does not conform to the existing Rapid Cabling schemes, the Manual Cabling Wizard should be used for setting up. Manual Wizard allows a great deal of flexibility and freedom, but takes a bit more time to complete. See the Manual Cabling Wizard chapter for details.

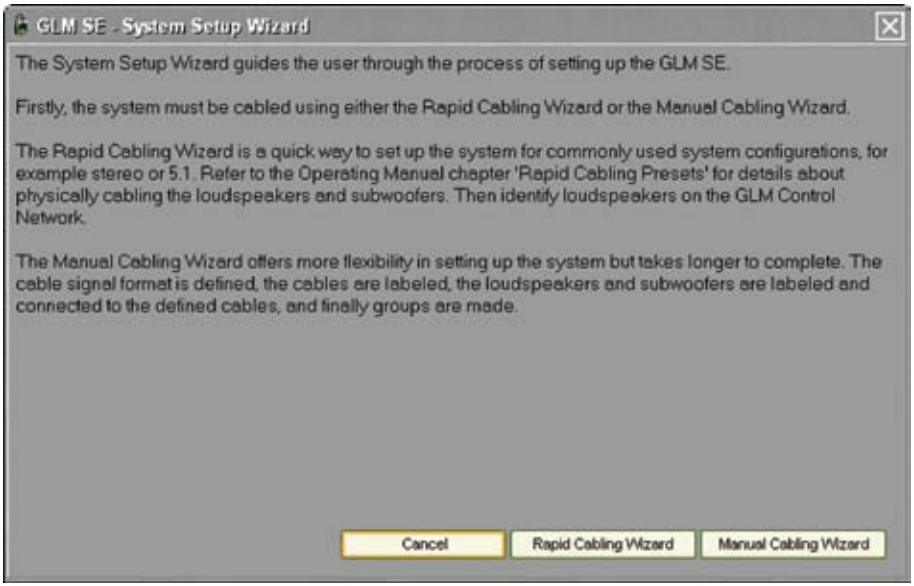
SYSTEM SETUP WIZARD

Wizard Introduction

There are several Wizards to help with loudspeaker system setup and acoustical alignment. The Setup Wizard allows selection between Rapid Cabling Wizard and Manual Cabling Wizard.

The Rapid Cabling Wizard is fast and effortless, and supports the most typical loudspeaker arrangements. Most System Setup tasks will be completed automatically. See the Rapid Cabling Wizard chapter for details.

The Manual Cabling Wizard should be used if the loudspeaker arrangement or the audio channel cabling does not conform to the existing Rapid Cabling schemes. Manual Wizard allows a great deal of flexibility and freedom, but takes a bit more time to complete. See the Manual Cabling Wizard chapter for details.



Rapid Cabling Wizard

Rapid Cabling Preset Selection

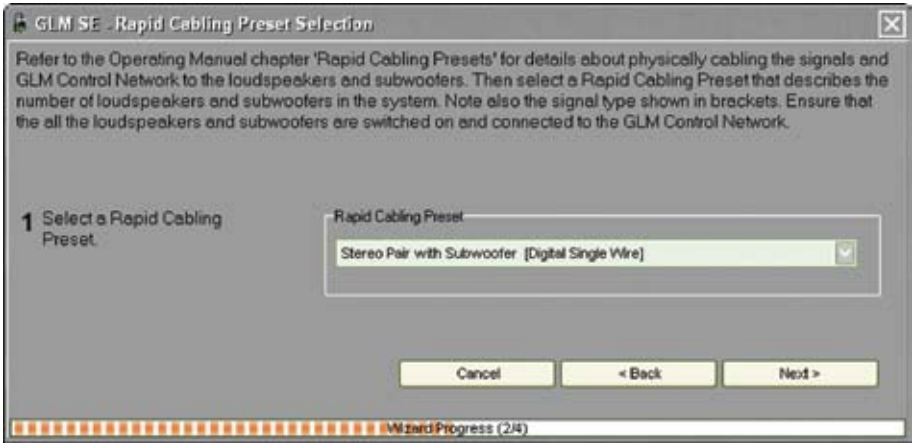
This window appears when launching the Rapid Wizard.

Rapid Wizard makes cabling up the loudspeaker system very fast and effortless by allowing one of the ready-made audio cabling schemes to be selected. Once a scheme has been selected, the Rapid Wizard will make most system definitions automatically.

The Rapid Cabling Presets available are:

- Stereo pair with subwoofer
- 5.1 system (five full-bandwidth audio channels and one LFE audio channel, reproduced by five loudspeakers and a subwoofer)
- 6.1 system (six full-bandwidth audio channels and one LFE audio channel, reproduced by six loudspeakers and a subwoofer)
- 7.1 system (seven full-bandwidth audio channels and one LFE audio channel, reproduced by seven loudspeakers and a subwoofer)

These Rapid Cabling Presets are available for Digital single-wire signal type. Select the appropriate scheme in the Rapid Cabling Preset window and click “Next”. This starts Rapid Wizard setup process.

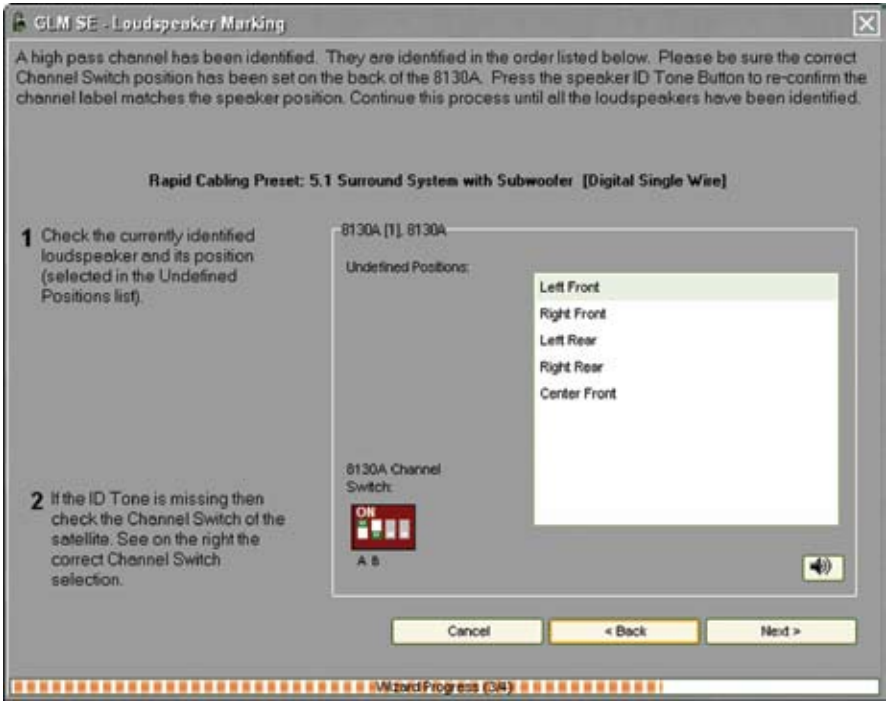


Loudspeaker Marking

This window is used with the Rapid Cabling Wizard.

Rapid Cabling allows selection of one of the ready-made digital audio cabling schemes. After having selected a scheme and cabled up, Loudspeaker Marking window allows the GLM.SE™ to assign each loudspeaker to an audio channel name available in the Rapid Cabling scheme.

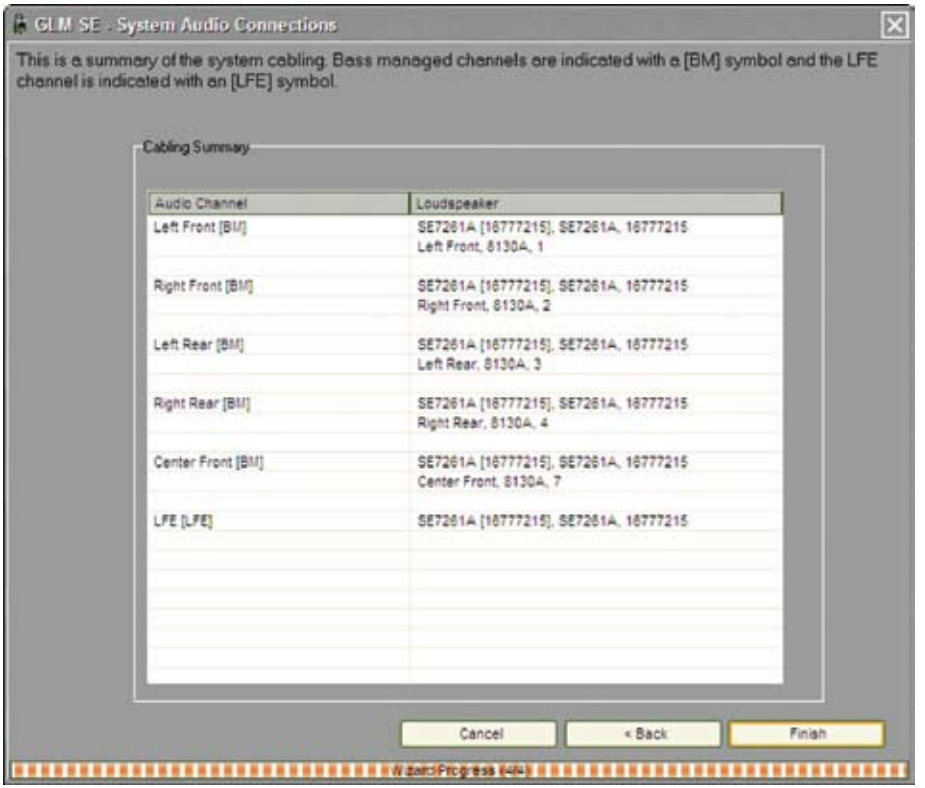
While displaying this window, one loudspeaker at a time will produce an audible identification tone from the loudspeaker to help locate it. The identification tone can be repeated by clicking the small loudspeaker icon. When using Rapid Cabling Presets, all identification tones start from output 1A (Left Channel, output 1). When using Manual Cabling Setups the first identification tone will come from the “A” side of the first connector that is identified and used on the SE7261A. Then click the “Next” button. After this another loudspeaker will be selected by the GLM.SE™. Again, match and affirm the described loudspeaker matches its actual position and click “Next”. This process will continue until all the loudspeakers have been identified. The GLM.SE™ selects the loudspeakers in the order in which they are wired to the subwoofer – starting with Channel (sub-frame) A, then B (if it is used).



System Audio Connections

The System Audio Connections window presents a summary of the audio channel definitions created and loudspeakers associated with each audio channel.

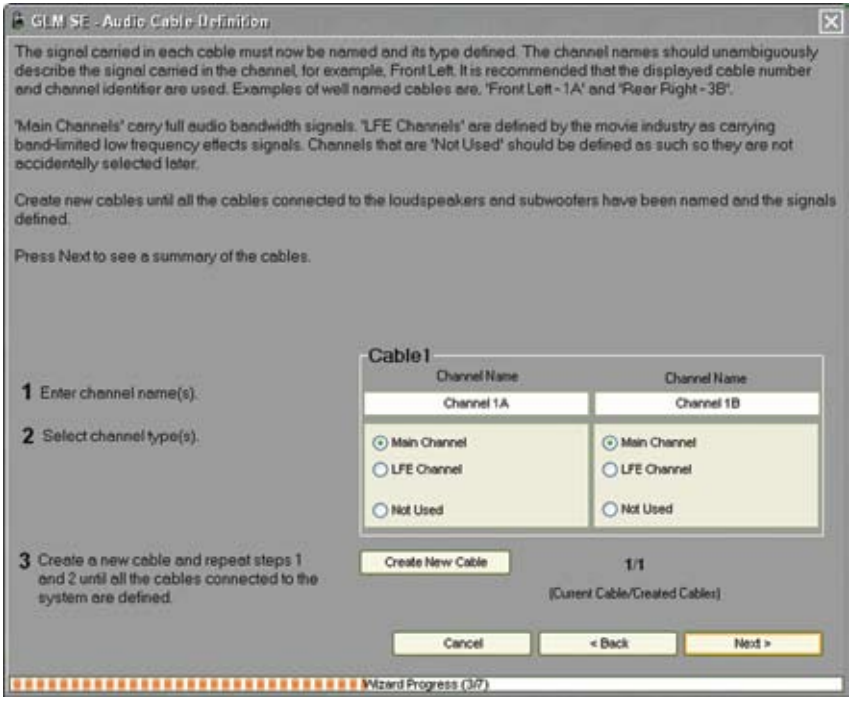
Verify that the information is correct. Use the Back button to reverse through the Cabling Wizard to a point where necessary corrections are required. When the information is correct, click “Next” to accept the System Audio Connections. This completes the System Setup process so the settings should be saved in a System Setup file. After this, proceed to run the Acoustical Setup Wizard.



Manual Cabling Wizard

The Manual Cabling Wizard can also be used to create a new setup. This happens automatically or by selecting the menu item “File | New” and then selecting in the appearing window the Manual Cabling Wizard.

The next screen to appear is the Audio Cable Definition page.

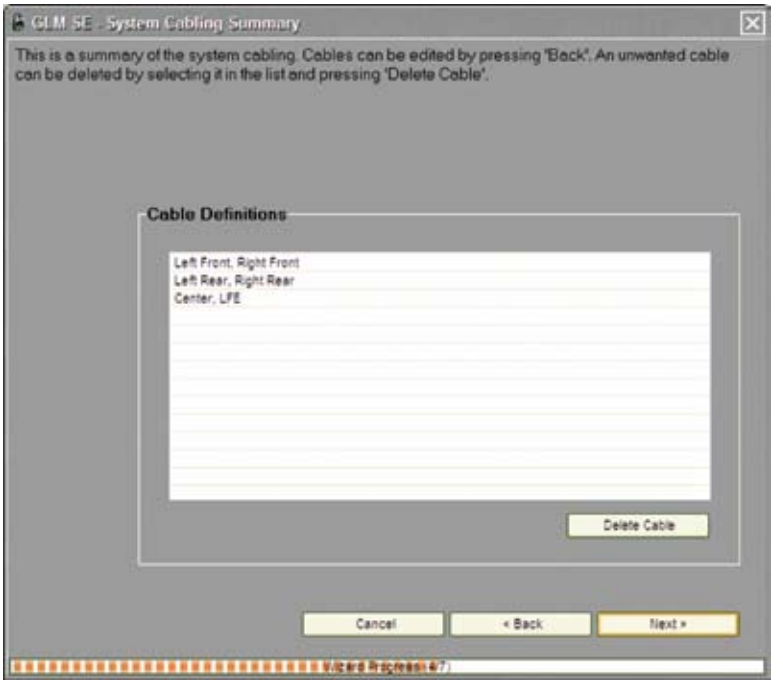


This screen displays the channels being carried on the two AES/EBU audio sub-frames. These are marked as Channel 1A and Channel 1B.

The example below shows the Left and Right channels being assigned to 1A and 1B respectively. Enter the channel names into each text box and select the proper channel type. If the system has more than two channels click “Create New Cable” until all the channels have been accounted for.

Click “Next>” to continue to the System Cable Summary.

Next is a summary of the loudspeaker system cable and audio channel definitions. Click the “<Back” button to move backwards to make changes or correct mistakes.



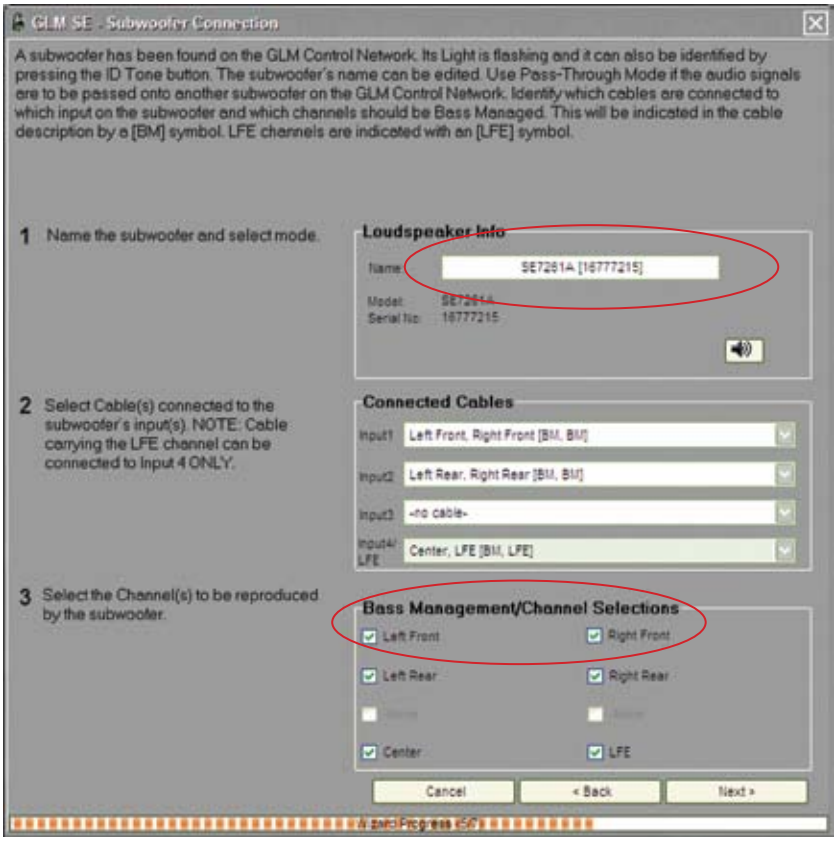
Click “Next>” to continue

Now the audio cable definitions are complete. Move on to describe connections in each loudspeaker.

Subwoofer Connection

Assign AES/EBU cables to appropriate inputs on the subwoofer. Use the pull-down menus under the area labeled “Connected Cables” to match the cables to the appropriate inputs. You can give a name to the subwoofer in “Loudspeaker Info” box.

Under the area labeled “Channel Selections”, note that the channels are automatically selected to be bass managed (BM). These channels will now be marked with “BM” in the “Connected Cables” area. If you do not want to have a channel bass managed, deselect the box adjacent to the channel label. Note that the LFE channel can only be connected to subwoofer AES/EBU input number 4.

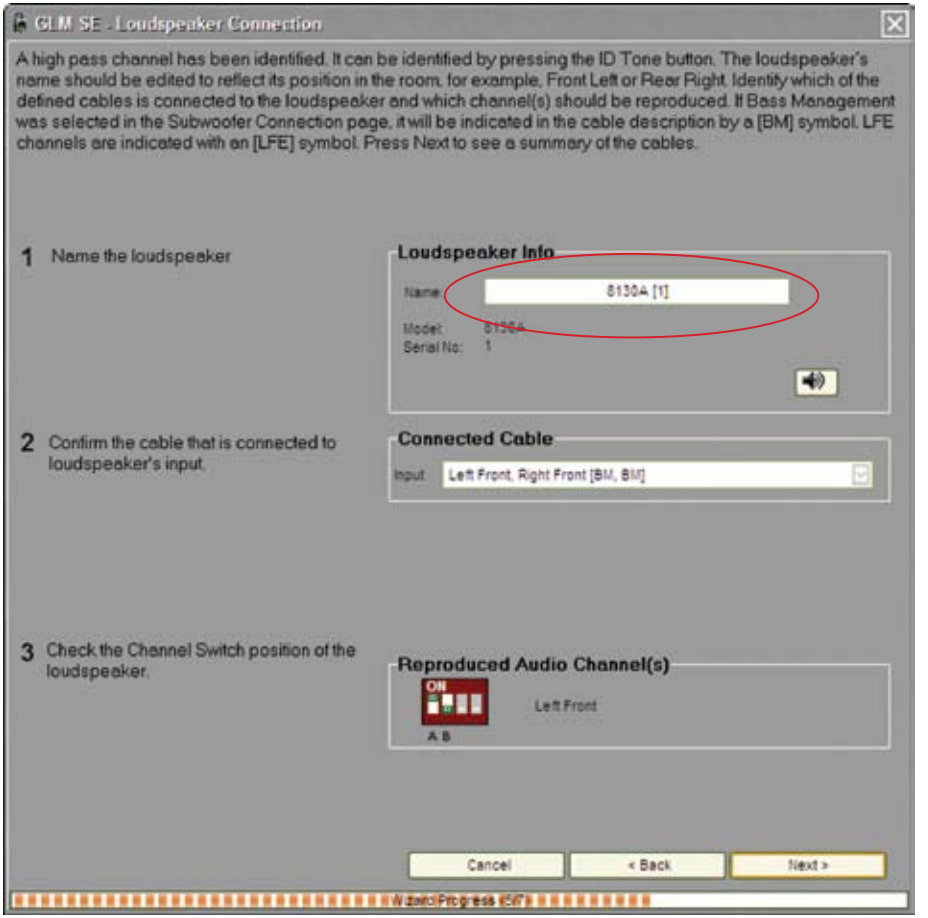


Click “Next>” to continue

Loudspeaker Connection

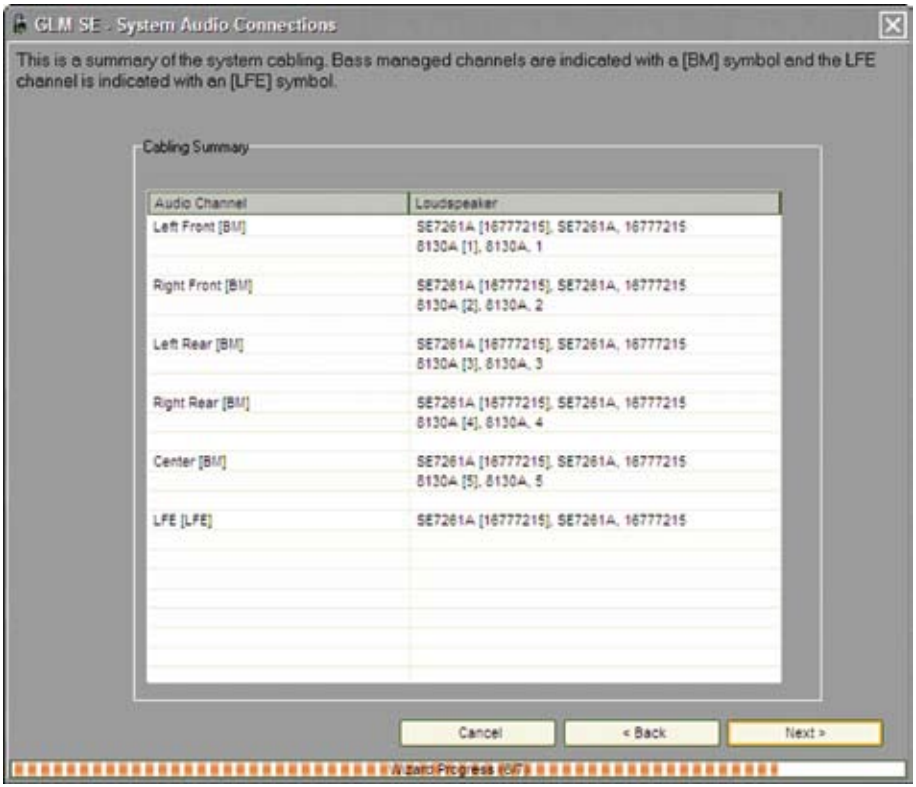
Now confirm the AES/EBU cables and the channel to be reproduced by the 8130A loudspeaker. To confirm that the settings of the correct loudspeaker are being edited, click the loudspeaker icon and an ID tone will be heard.

You may also name the 8130A loudspeaker in the “Loudspeaker Info” line.



Click “Next>” to continue to System Audio Connections

The System Audio Connections page displays channel labeling, cable connections, and all reproduced audio channels. In case changes need to be made, click the “Back” button to return to the earlier windows.



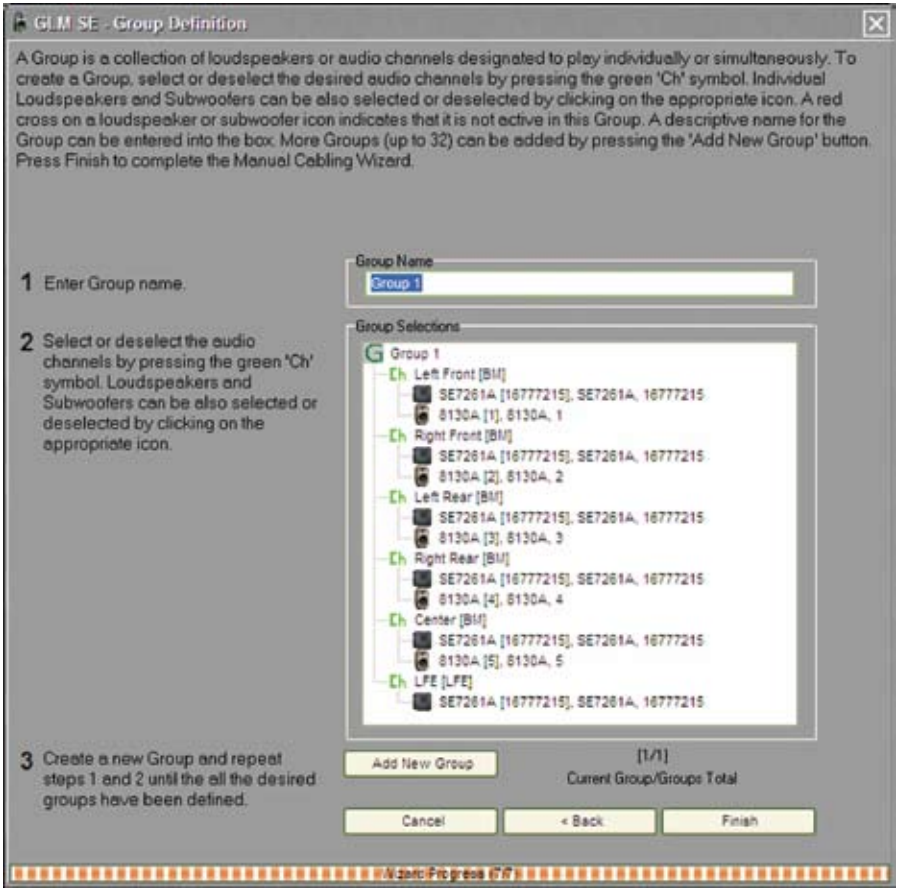
Click “Next>” to continue.

Creating Groups

A Group enables rapid selection of a set of audio channels/loudspeakers.

To create a Group, type in a name in the text box and select/deselect the desired loudspeakers for the Group by clicking on the loudspeaker icons.

Click “Add New Group” to create another Group. Up to 32 Groups can be created.
Click “Finish” to Save and complete the Manual Cabling Wizard.



Saving the Setup

Automated Saving

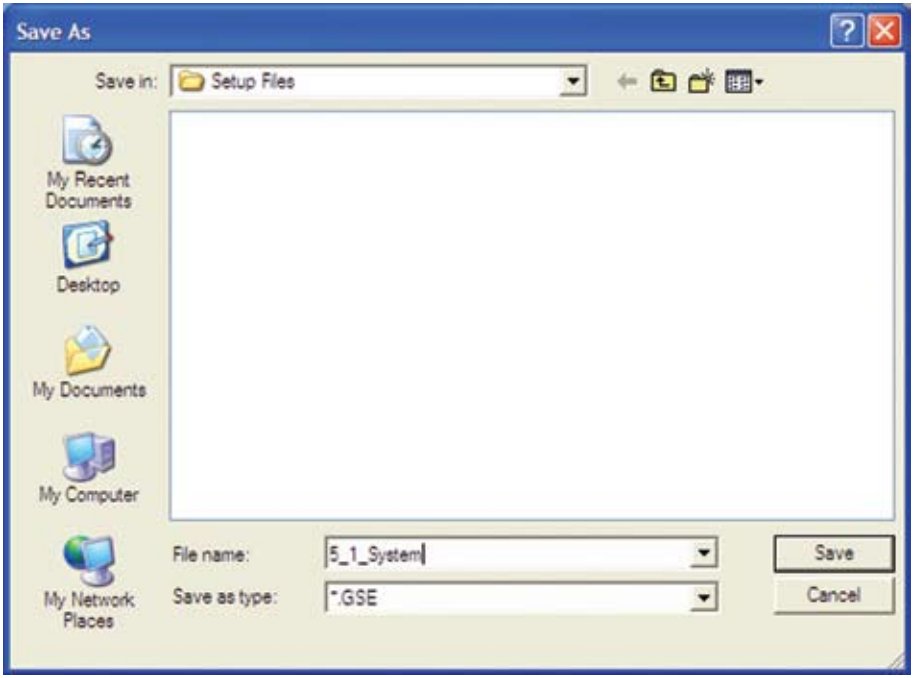
While running the GLM.SE™ Wizards, a question may appear asking the user to save the changes done up to that point. This allows for convenient and timely saving while running the Wizard.

At this point the user is asked to save the settings made so far into a System Setup file. To save the setup, type in a name and click “Save”. Once the setup has been saved there is a choice to run the Acoustical Setup Wizard or to proceed directly to the GLM.SE™ Main Page.

The setup can also be saved manually at any time after a Wizard has been completed. To save into the current setup, select the menu item “File | Save”.

To save a setup under a new name, select the menu item “File | Save As…”.

Note that Setup files should ONLY be stored in the default folder as specified by GLM.SE™.



ACOUSTICAL SETUP WIZARD

After the System Setup Wizard has been completed, there is an option to run the Acoustical Setup Wizard. The Acoustical Setup Wizard may also be accessed at any time from the Setup menu on the main page.

AutoCal™. AutoCal™ is an automatic calibration system that uses a calibrated precision measurement microphone, and is able to fully calibrate a multiple loudspeaker system. It is possible to manually edit the acoustic settings after running AutoCal™ using the Interactive Response Editor, which may be found in the Acoustical Settings Editor. To run AutoCal™, select one of the sound card options (Genelec sound card is recommended) and click “Yes”.

Study the section Placing Loudspeakers in the Monitoring Room to understand the most important acoustical principles of placing loudspeakers into a monitoring space and the best ways to optimize sound quality. It is important to note that electronic alignment should not be used to fix problems due to inappropriate loudspeaker positioning in the room or incorrect angling of cabinets. It is important to place and aim the loudspeakers correctly BEFORE equalizing. In addition, it is generally better to solve acoustical problems in the room using acoustical solutions rather than relying on electronic equalization.

AutoCal™ - Theory of Operation

AutoCal™ uses sequenced test signals and a high quality calibration microphone to find the correct acoustical alignments for the 8130A loudspeakers and SE7261A subwoofer on the GLM.SE™ Control Network. A high quality Genelec Sound Card is also integrated in the Network Interface to provide precise measurement signal handling. We recommend that you use the Genelec Sound Card when running AutoCal™. The procedure is described below.

AutoCal™ uses sine tone sweeps generated by the SE7261A subwoofer. These sweeps are recorded using a calibrated Genelec 8200A Calibration Microphone, over one or more positions, and the impulse responses calculated. AutoCal™ then determines the correct acoustical settings for each high pass output as well as the SE7261A to obtain:

- Flat frequency response at the listening position, or over an area.
- Equal delay from all loudspeakers to the primary listening position.
- Proper alignment of the subwoofer(s) in terms of output level and crossover phase (referenced to a selected loudspeaker).

When AutoCal™ has optimized the Room Response Control settings the results can be saved into the System Setup file. Further adjustment is then possible using the Acoustical Settings Editor.

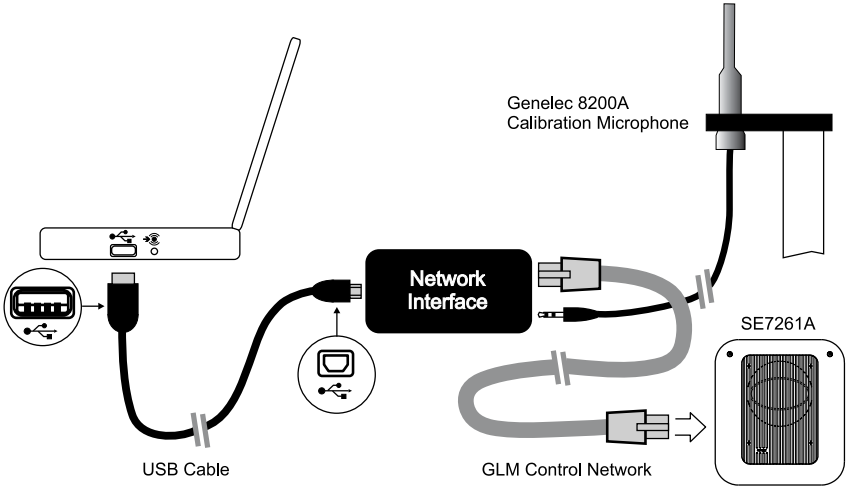
AutoCal™ is an acoustical measurement system, so do not move around, talk or stand close to the microphone when the measurements are being performed. A five second delay countdown starts from the moment the “P” button is pressed until the first sweep tone is emitted. AutoCal™ is not designed to compensate for poor room acoustics and/or poor loudspeaker positioning. These issues should be addressed before using electronic equalization.

Setting up for AutoCal™

To Set up for AutoCal™ with Genelec Network Interface / Sound Card

This option is STRONGLY recommended.

The Network Interface incorporates a high quality Genelec USB Sound Card and is only active when the AutoCal process is running. The Genelec Sound Card first initializes as a USB Audio CODEC when the AutoCal Window is opened. Once the AutoCal is completed, GLM automatically shuts down Genelec Sound Card and USB Audio CODEC disappears.



- Place the Genelec 8200A Calibration Microphone on a microphone stand using the microphone holder supplied in the GLM.SE™ DSP Loudspeaker Manager Package. This holder positions the microphone at the correct angle and mechanically decouples the microphone from the stand.
- Connect the microphone's cable to the "AutoCal™ Microphone" socket of the Network Interface.
- The output of the microphone preamp is carried via the USB port connection, not the "Mic Preamp out" jack.
- Confirm that the network connection properly exists between the computer and SE7261A via the Control Network / Sound Card Interface.

Optional Set up for AutoCal™ with Host Computer's Internal Default Sound Card

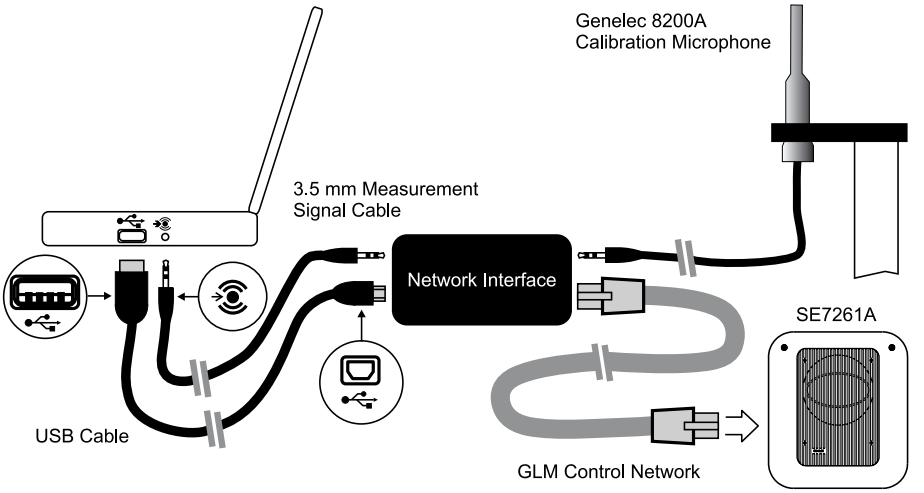
This option is only recommended if problems are encountered during Genelec Sound Card Installation.

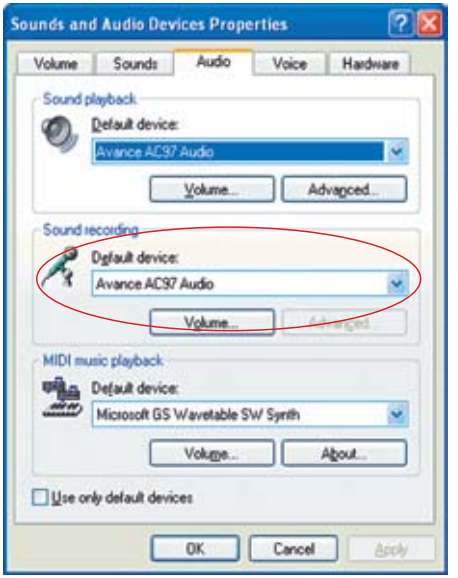
- Place the Genelec 8200A Calibration Microphone on a microphone stand using the microphone holder supplied in the GLM.SE™ DSP Loudspeaker Manager Package. This holder positions the microphone at the correct angle and mechanically decouples the microphone from the stand.
- Connect the microphone's cable to the "AutoCal Microphone" socket of the Network Interface.
- Connect one end of the 3.5 mm Measurement Signal Cable to the "Mic Preamp out" socket of the Network Interface and the other end to the microphone input of the computer's sound card.
- Confirm that the network connection properly exists between the computer and SE7261A via the Control Network / Sound Card Interface.

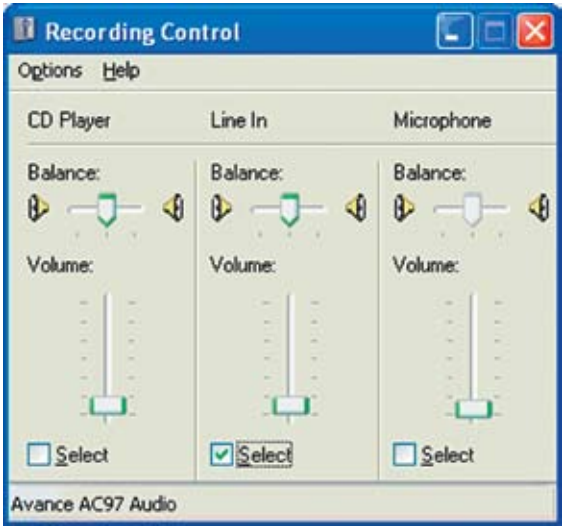
The AutoCal™ uses the default sound card in the GLM.SE™ computer and the line input or microphone input that has been defined in the Windows Control Panel settings. Ensure that the input where the measurement microphone signal has been connected is selected as the input in the Windows Control Panel.

This can be found in the Control Panel, Sound and Audio Devices, select "Audio" tab, in the Sound Recording frame, click on the "Volume..." button. This opens the "Recording Control" window. Ensure that the correct input has been selected. The use of a line input is recommended. However, all computers do not have a line input even if a line input is shown in the Recording Controls window. In that case you must use the microphone input, and select the microphone input in the Recording Controls window. AutoCal™ will automatically set the correct Volume setting for this input.

Make sure additional signal processing for automatic level control, microphone boost or telephone bandwidth filtering has been disabled in the computer control panel. Sometimes these settings will be found under the Advanced Settings button.


Genelec 8200A
Calibration Microphone
3.5 mm Measurement
Signal Cable
Network Interface
SE7261A
USB Cable
GLM Control Network


Sounds and Audio Devices Properties
Volume
Sounds
Audio
Voice
Hardware
Sound playback
Default device:
Avance AC97 Audio
Volume...
Advanced...
Sound recording
Default device:
Avance AC97 Audio
Volume...
MIDI music playback
Default device:
Microsoft GS Wavetable SW Synth
Volume...
About...
Use only default devices
OK
Cancel
Apply


Recording Control
Options
Help
CD Player
Line In
Microphone
Balance:
Volume:
Select
Avance AC97 Audio

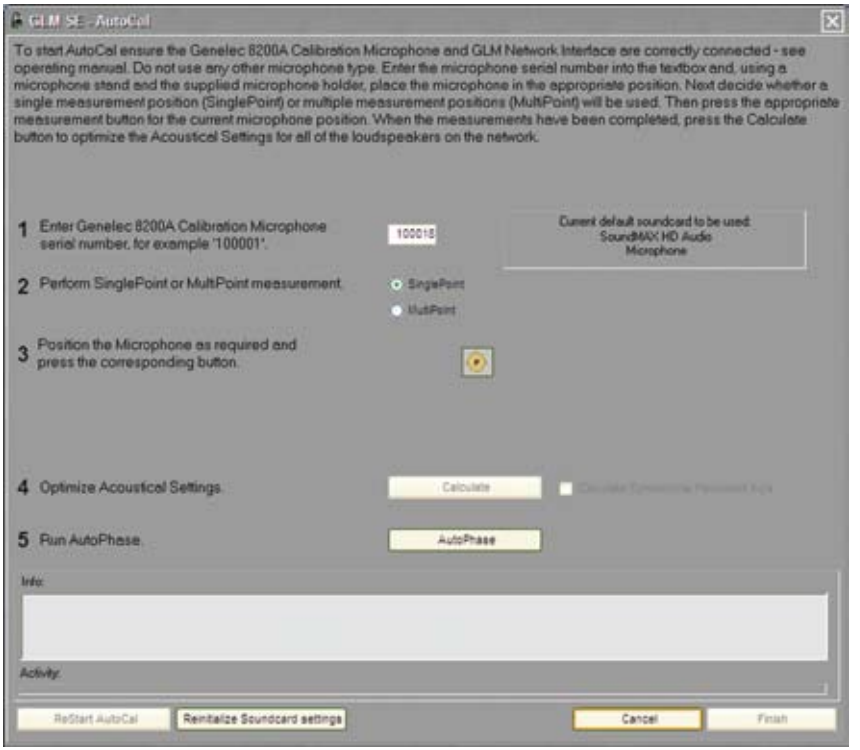
Running AutoCal™

AutoCal™ can be run at the end of either Cabling Wizards or from the GLM.SE™ Main Page menu “Setup | GLM.SE™ Acoustic Wizard”.

When the Sound Card Option window appears, select “AutoCal™ with Genelec sound card” and press “Yes”.

The AutoCal™ process consists of two main stages; firstly the acoustic responses of the SE7261A and 8130As are measured, secondly they are then aligned for flat response, equal delay and level. Below is a more detailed description of what happens and needs to be done by the user:

- Connect all the cables as described above.
- Type and enter the serial number printed on the side of the Genelec 8200A Calibration Microphone into the “Microphone Serial Number” box. This retrieves the calibration file for that microphone. The calibration file corrects for small frequency response and sensitivity differences between microphones.
- Before starting the measurements, decide whether only the primary listening position is to be measured (SinglePoint measurement) or whether additional measurement positions (MultiPoint measurement) will be used.



Note: Spatial averages generally show less variation than a single point measurement, therefore less equalization will be applied. This is useful if there is a listening area rather a single well-defined listening point. The primary listening position measurement constitutes 50% of the MultiPoint response and the sum of the other measurements makes up the remainder. This biases the results towards the center of the listening area.

- Position the microphone at the primary listening position (normally the center of the mixing console) and press the button labeled “P” (brown color).
- Before the loudspeaker measurements begin, AutoCal™ automatically compensates for the response of the input stage of the soundcard. This is done to ensure that the frequency response of the microphone input does not affect the acoustic measurement results. It only needs to be done once, when AutoCal™ is first run.
- Next, all the subwoofers and loudspeakers will be measured one at a time.
- If this is a MultiPoint measurement, move the microphone to a new position, press one of the numbered buttons and another set of measurements will be taken. Up to 3 optional

positions can be measured in this way. The additional points may be measured in any order. Any number of additional points up to three may be measured.

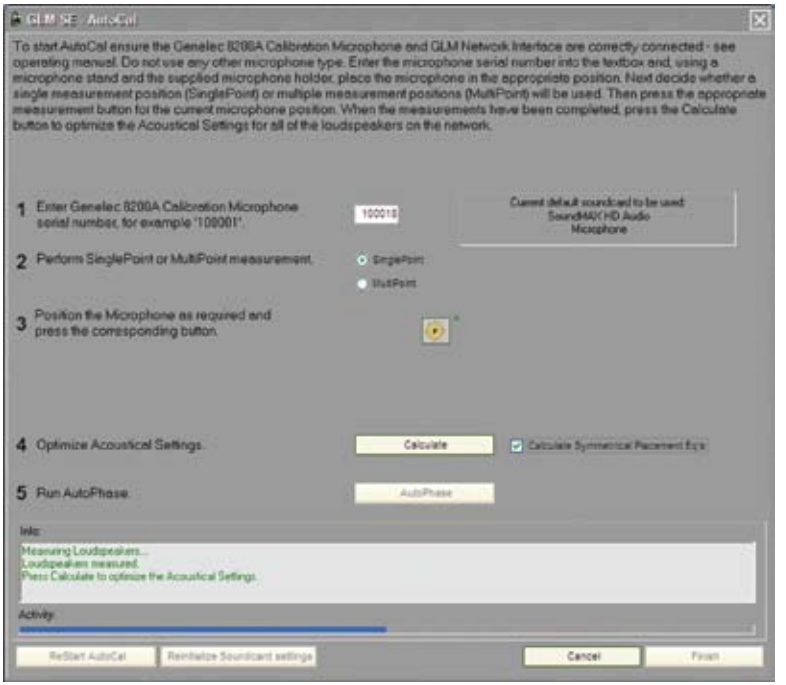
- Once the measurements have been completed, press the “Calculate” button to optimize the Room Response Controls in each subwoofer and loudspeaker. The measurement taken at the primary listening position constitutes 50% of the frequency response to be optimized. The remaining 50% is the sum of the MultiPoint measurements. Delays and levels are based on the primary measurement.
- After optimization, the result for each loudspeaker and subwoofer can be reviewed. The response of each loudspeaker may be viewed by clicking on the loudspeaker name in the Loudspeaker List.
- Finally press the “Finish” button and decide whether to save the results to the setup file, press the “Yes” button, or discard them, press the “No” button. New acoustical settings will be immediately set in all loudspeakers and subwoofers.

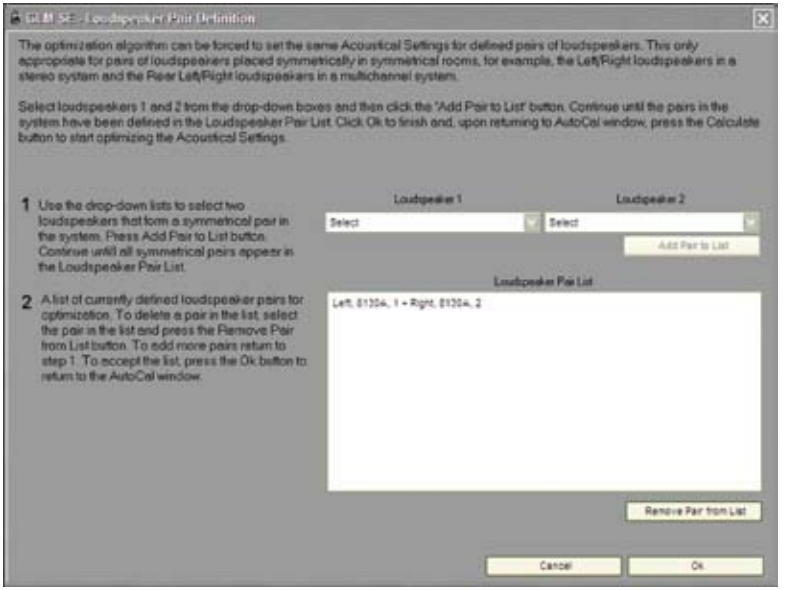
Symmetrical Placement EQ™

To maintain a very accurate stereo image AutoCal™ can be forced to design one filter used for both loudspeakers forming a stereo pair, for example the Left and Right Front loudspeakers. The intent of this feature is that it be used only in environments that are symmetrical and where the loudspeakers are placed symmetrically in that space. To do this, the “Calculate Symmetrical Placement Eq’s” checkbox need to be activated and the “Calculate” button needs to be engaged (The Loudspeaker Pair Definition window will be opened before the optimization starts.)

In the Loudspeaker Pair Definition window, select loudspeakers 1 and 2 in the drop-down lists, then click the “Add Pair to List” button and continue doing so until all stereo pairs in the system have been defined in the Stereo Pair List. Click “Ok” to finish and start the equalizer design.

A loudspeaker pair can be deleted from the Loudspeaker Pair List by selecting the pair from the list and pressing “Remove Pair from List” button. If the Symmetrical Placement is not desired then the “Cancel” button can be pressed (the equalizer design will not start before “Calculate Symmetrical Placement Eq’s” checkbox is deactivated and the “Calculate” button is engaged).


GLM SE - AutoCal
To start AutoCal ensure the Genelec 8200A Calibration Microphone and GLM Network Interface are correctly connected - see operating manual. Do not use any other microphone type. Enter the microphone serial number into the textbox and, using a microphone stand and the supplied microphone holder, place the microphone in the appropriate position. Next decide whether a single measurement position (SinglePoint) or multiple measurement positions (MultiPoint) will be used. Then press the appropriate measurement button for the current microphone position. When the measurements have been completed, press the Calculate button to optimize the Acoustical Settings for all of the loudspeakers on the network.
1 Enter Genelec 8200A Calibration Microphone serial number, for example "100001".
100018
Current default soundcard to be used:
SoundMAX HD Audio
Microphone
2 Perform SinglePoint or MultiPoint measurement.
SinglePoint
MultiPoint
3 Position the Microphone as required and press the corresponding button.
4 Optimize Acoustical Settings.
Calculate
Calculate Symmetrical Placement Eq's
5 Run AutoPhase.
AutoPhase
Info:
Measuring Loudspeakers...
Loudspeakers measured.
Press Calculate to optimize the Acoustical Settings.
Activity:
ReStart AutoCal
Reinitialize Soundcard settings
Cancel
Finish


GLM SE - Loudspeaker Pair Definition
The optimization algorithm can be forced to set the same Acoustical Settings for defined pairs of loudspeakers. This only appropriate for pairs of loudspeakers placed symmetrically in symmetrical rooms, for example, the Left/Right loudspeakers in a stereo system and the Rear Left/Right loudspeakers in a multichannel system.
Select loudspeakers 1 and 2 from the drop-down boxes and then click the "Add Pair to List" button. Continue until the pairs in the system have been defined in the Loudspeaker Pair List. Click Ok to finish and, upon returning to AutoCal window, press the Calculate button to start optimizing the Acoustical Settings.
1 Use the drop-down lists to select two loudspeakers that form a symmetrical pair in the system. Press Add Pair to List button. Continue until all symmetrical pairs appear in the Loudspeaker Pair List.
Loudspeaker 1
Loudspeaker 2
Select
Select
Add Pair to List
2 A list of currently defined loudspeaker pairs for optimization. To delete a pair in the list, select the pair in the list and press the Remove Pair from List button. To add more pairs return to step 1. To accept the list, press the Ok button to return to the AutoCal window.
Loudspeaker Pair List
Left, 81304, 1 + Right, 81304, 2
Remove Pair from List
Cancel
Ok

Subwoofer Phase Alignment Using the AutoPhase

The AutoPhase automatic subwoofer phase calibration process can individually select the optimal phase alignment setting for the subwoofer in the loudspeaker system for a specified crossover frequency and reference loudspeaker. The optimal phase alignment results in the best flatness of the acoustic response within the subwoofer-to-loudspeaker crossover region.

For optimal performance, the AutoPhase process should be rerun every time the crossover frequencies for the subwoofers are changed. Also, if you change the subwoofer Distance value in the Acoustical Settings Editor for Subwoofer, the AutoPhase process must be rerun for best performance.

Please note that when you run AutoCal™ for the entire loudspeaker system, the option to run AutoPhase is also available.

In order to run the subwoofer phase calibration process, the measurement microphone must be connected to the computer using the Network Interface, and the microphone must be placed at the primary listening position.

To access the automatic subwoofer phase alignment or AutoPhase, enter the Acoustic Wizard, select the AutoCal™, and click ”Yes”. This opens the AutoCal™ window presenting a five-point process of automatic calibration. To directly access the AutoPhase, find step number five, ”Run AutoPhase”, and click the ”AutoPhase” button.

This opens the AutoPhase window, presenting the SE7261A on the control network. For this subwoofer, select in the drop down boxes the Crossover, Channel, and Loudspeaker.

The Crossover defines the crossover frequency for the subwoofer.

The Channel is the audio output channel for the test tone in the subwoofer. The loudspeaker must be connected to reproduce this audio channel, and the audio cable must be connected from the subwoofer to the 8130A. The Loudspeaker is the reference loudspeaker for subwoofer phase alignment. One of the loudspeakers connected to the subwoofer is selected as the reference loudspeaker.

After crossover frequencies and reference loudspeakers have been defined for the SE7261A subwoofer, click the ”Calibrate” button to start the AutoPhase process.

When the calibration process is running, a test tone is switched on by the GLM.SE™, and the microphone signal is recorded and analyzed. All noise or other audio signals should be avoided during the calibration process, while the test tone is playing.

Editing AutoCal™ Settings Manually

Once AutoCal™ measurements have been taken, they become available in the GLM.SE™ Acoustic Editor. A new button will appear under the graphic presentation of the equalizer response.

Clicking the “Interactive Response Editor” button opens a new window, the Interactive Response Editor.

This window now shows the response measured by AutoCal™, the correction and the corrected acoustic response. This view is interactive and will immediately respond to changes in the controls on the Acoustical Settings Editor page. Manually editing the numbers in the Room Response Controls section on this page will change the correction in the loudspeaker. The same can be affected by pulling any controls on the

interactive filter response display. Also, any changes in filtering are immediately audible in the loudspeaker. This way it is possible to manually edit the equalization created by AutoCal™.

Click “Ok” in the Acoustical Settings Editor to save the edited settings in the System Setup File.

Storing Settings Permanently Into the SE7261A

The Acoustical Settings determined by AutoCal™ are not automatically uploaded to the memory inside the SE7261A. They are saved in the currently open System Setup file in the computer.

If the GLM.SE™ software is always used to control the system, it is not necessary to store the Acoustical Settings determined by AutoCal™ into the SE7261A subwoofer. Opening any System Setup file fully restores all Acoustical Settings in a system attached to that Setup.

If the GLM.SE™ is not used to control the system, the system will be working in the stand-alone mode. For stand-alone use, the Acoustical Settings determined by AutoCal™ should be written into the SE7261A subwoofer. This is achieved by selecting the Main Page menu item “Setup | Store Acoustic Settings to SE Subwoofer (With Full Master Level)” or “Setup | Store Acoustic Settings to SE Subwoofer (With Current Master Level)” depending on the master level you prefer to use.

Storing the Acoustical Settings inside the subwoofer’s memory is a very effective way of performing full system calibration for a stand-alone Genelec DSP loudspeaker system. Use AutoCal™ to determine the system calibration, store the settings permanently in the subwoofer and then remove the GLM.SE™ Control Network. One computer running GLM.SE™ can be used to set up any number of systems, for example a multi-room studio or broadcast facility. The settings for each system can be stored in different System Setup files and so are readily available should the system need to be reinstalled or maintained in some way.

One example of such maintenance is if a subwoofer fails. Simply replace the subwoofer and rewrite the system setup into the SE7261A on the GLM.SE™ Control Network. Another example is where systems may be warehoused and called out for use in one of several rooms. The loudspeakers must be re-assigned for this to succeed, i.e. the correct serial number must be found or serial numbers in the system setup file must be swapped to the serial number of loudspeakers actually existing on the GLM.SE™ Control Network. This process is explained in the section “Replacing Loudspeakers.”

Please note that the LFE +10 dB data is NOT written to the SE7261As internal memory. This is due to the fact that some multi-channel formats do not support the 10 dB boost. Session-to-session requirements may vary with respect to this. While in the Stored Settings mode of operation, the 10 dB boost switch is available to be changed, either at the connector panel switch or via the optional remote control (Order code 7000-416) connected to the RJ11 connector on the SE7261A connector panel.

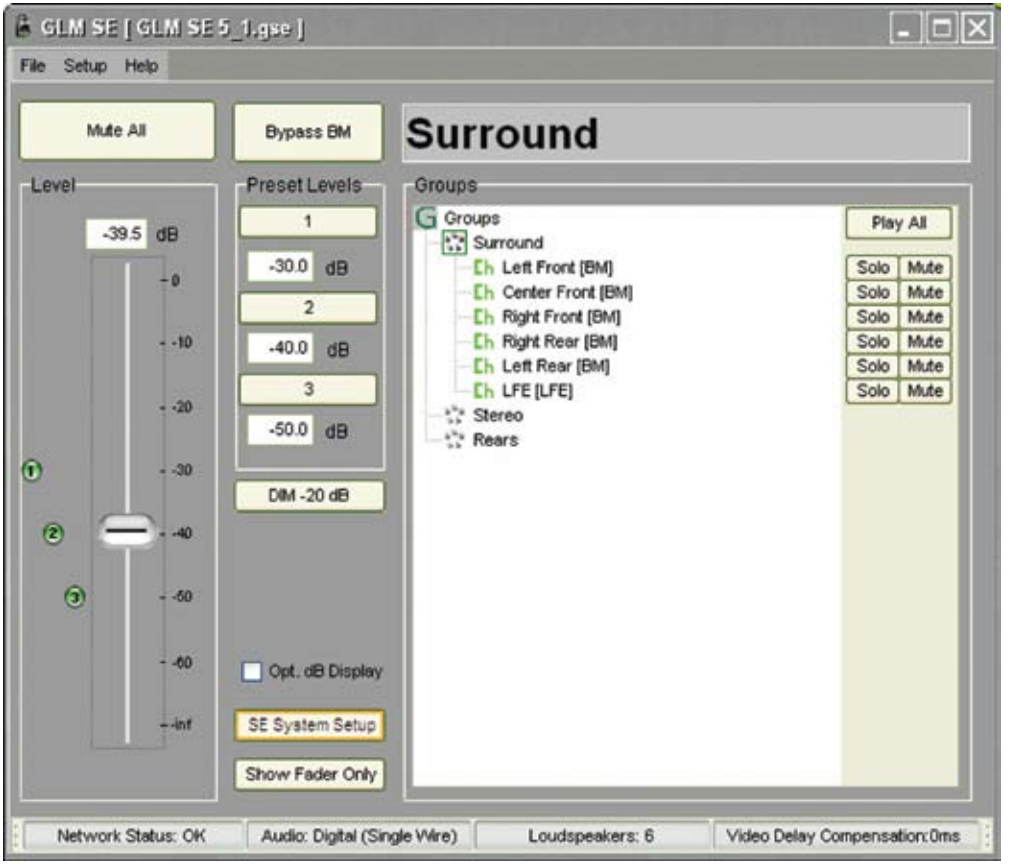
BASIC USE OF THE GLM.SE™

The Genelec Loudspeaker Manager provides a versatile set of tools to operate the loudspeaker system. For more details, study the section on the basic use of the GLM.SE™.

GLM.SE™ Main Page

The Main Page of the GLM.SE™ has the following primary functions:

- Volume functions (volume adjustment, volume presets, DIM, system mute)
- Bass management bypass
- Audio channel Group functions (group activation, solo and mute audio channels)



Mute All and Bypass BM

In the upper left corner there are two system level controls. When activated, the background color of these buttons will change to red.

The “Mute All” button mutes the entire loudspeaker system. Other functions in the GLM.SE™ may be operated while Mute All is activated. This control has an overriding effect, and any changes made elsewhere will take effect once the “Mute All” button is deactivated.

The “Bypass BM” button offers control of the subwoofer’s bass management system.

- When the “Bypass BM” button is engaged (red background), signals sent to the loudspeakers are not filtered in the subwoofer bass management section and the low frequency content in the signals remains intact.
- When the “Bypass BM” button is disengaged (grey background), audio content below the bass management crossover frequency are fed to the subwoofer and removed from the signals sent to the loudspeakers.

Note that this is not a “subwoofer mute” command. If there is an LFE channel (low frequency effects), the subwoofer will reproduce the LFE channel even while the “Bypass BM” is active.

Volume Control

The “Page Up” and “Page Down” keyboard keys and the “Up” and “Down” arrow keys can be used to increment the volume up or down in 0.5 dB steps. The mouse can also be used to increment the volume up and down in 10 dB steps by clicking on the volume fader.

A third-party USB physical volume controller knob (e.g. Griffin PowerMate) can be used to adjust control the volume, bass management bypass and mute functions. If the computer is located away from the listening position, the USB knob can be placed up to 25 meters (75 ft.) away from the computer using active buffered USB extension cables, or up to 5 meters (15 ft.) with passive USB extension cables.

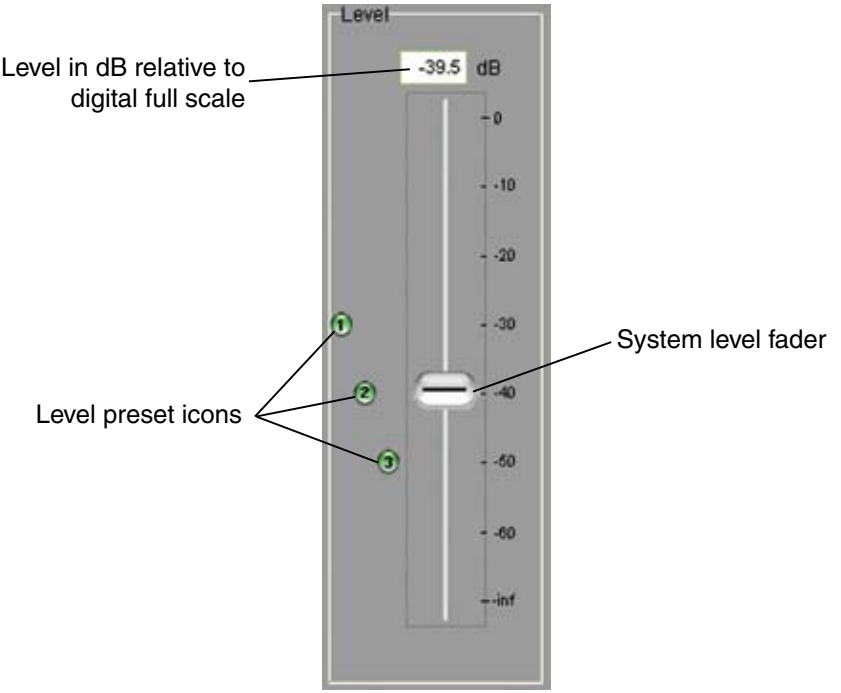
To the left of the volume fader there are three level preset icons. There are two ways to select a level preset.

- Click the left mouse button on one of the green level preset icons placed on the left of the system volume fader.
- Click the left mouse button on the level preset buttons in the “Preset Levels” frame.

The DIM button reduces the system volume by -20 dB. When activated, the button color changes to red. System volume and select volume presets are adjustable while the system DIM is active, but the actual volume remains -20 dB below the value shown in the main window.

If the system has been calibrated for a Reference Level (Menu … Setup | Calibrate Reference Level), a dB value will be displayed below the “DIM -20 dB” button.

The Reference Level is defined at the Primary Listening Position. Commercially released movies are normally mixed at a reference level of 85 dB. Domestic broadcast and DVD releases are normally mixed at a reference level of 79 dB. Music is mixed at whatever level the engineer prefers. The true or total sound level depends of the actual number of loudspeakers playing and the program material fed into them.



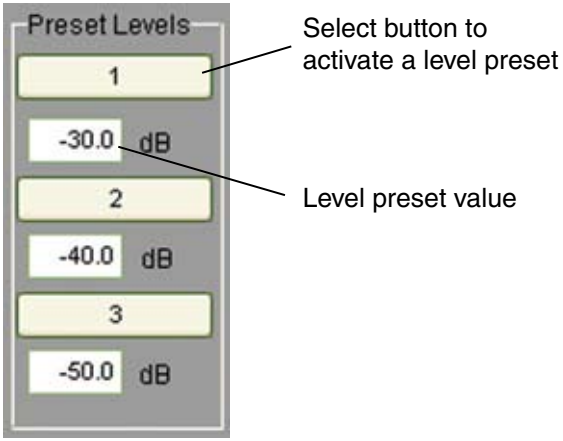
Clicking the “Show Fader Only” button selects between the full view of the main window and a small window showing only the level fader with the level preset icons.

Level Presets

The level preset section of the main window allows quick access to three preset sound levels.

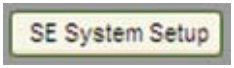
The are two-ways to set Level Presets.

- Enter a value into the “Preset Levels” value box.
- Hold down the SHIFT key, locate the mouse pointer on one of the green level preset markers to the left of the level fader and press down the left mouse button. Drag the icon to the required level and release the mouse button.



Access to the GLM.SE™ System Setup Editors

The “GLM.SE™ System Setup” button activates the System Setup Editor. This allows for changes to cabling, groups and acoustical settings of the loudspeakers in the system. For further details about editing system settings consult the System Setup Editor and Acoustic Setup Editor sections on this manual.



Information Data Banner

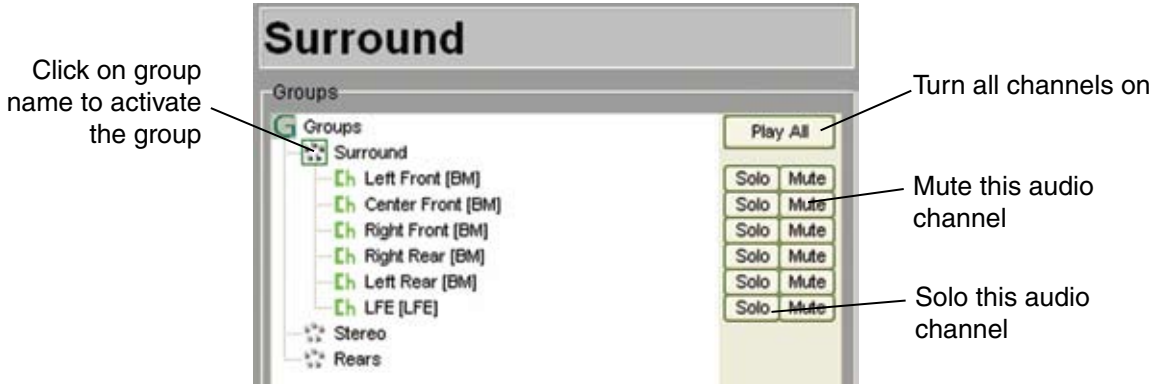
An Information Data Banner is located at the bottom of the screen and displays some useful data about the current System Setup.

- Network status. The alternatives shown are “OK” meaning that the control network is running normally; “Check IF” when the GLM.SE™ is searching to find a network interface in one of the USB ports on the computer; and “DEMO” when GLM.SE™ is run without the GLM.SE™ Network Interface connected.
- Type of audio cabling.
- This field can be used to verify what number of loudspeakers are currently being used in the Setup.
- Amount of Video Delay Compensation.

Audio Channel Group Functions

The right side of the Main GLM.SE™ page provides some Group functions. The audio channels in the loudspeaker system can be arranged into Groups, and clicking on the Group name activates a Group. When a Group is activated, it opens and shows the audio channels belonging to this Group. Only the channels belonging to the Group will play.

To the right of the audio channel names are the “Solo” and “Mute” buttons. By clicking on these buttons it is possible to solo and mute one or more audio channels. The “Play All” button resets any mute and solo selections. Note that clicking “Play All” does not turn the audio on if the “Mute All” button is active.



Menu Items

The “File” menu allows access to System Setup files.

- “File | New” Starts the System Setup Wizard and is used to make a new setup from the beginning.
- “File | Open” Loading a System Setup File in the GLM.SE™ automatically sets up all loudspeakers in the system with monitoring group definitions, audio cable definitions, defaults for monitoring levels and all acoustical alignment settings from a previously saved System Setup File.
- “File | Save” stores all settings into the currently open System Setup file.
- “File | Save As…” is used to save modifications in the current setup under a new System Setup file name.
- Up to five recently used System Setup files are listed below “Save As”.
- “File | Exit” closes the GLM.SE™.

- “Setup | Set GLM.SE™ Startup Level” reads and stores the current setting of the volume fader and uses this volume setting when starting the GLM.SE™.
- “Setup | Calibrate Reference Level” opens the Reference Level Calibration page.
- “Setup | Configure Powermate Controls” opens the Powermate configuration page.
- “Setup | Change Channel Order” allows for changes to be made to the order in which audio channels are listed in the Groups.

- “Setup | Password Protection” allows for password protection of System Setup files. After setting a password, a System Setup file can be opened but not saved without knowing the password. This way, System Setups can be protected from unwanted tampering or alteration.
- “Setup | Acoustical Setup Wizard” runs the Acoustical Setup Wizard for with the currently open System Setup file. To create a new setup from scratch, select “File | New” and then run the Rapid or Manual Cabling Wizard and Acoustical Setup Wizard.

- “Setup | GLM.SE™ System Setup Editor” open the System Setup Page.
- “Setup | Store Acoustic Settings to SE Subwoofer (With Full Master Level)” permanently stores all Acoustical Settings into the subwoofer. Note that the Acoustical Settings defined in the currently open System Setup file are used for all loudspeakers, but whenever a new System Setup file is opened, all acoustic settings for all loudspeakers will be written according to this new System Setup file. Any Stored Settings will be available in Stand-Alone mode if the switch on the subwoofer connector panel is set to the position “STORED CTRLS” and the GLM.SE™ Control Network is detached from the subwoofer.
- “Setup | Store Acoustic Settings to SE Subwoofer (With Current Master Level)” saves the acoustic settings with attenuation corresponding to the master level fader setting on the GLM.SE™ window.

- “Setup | Recall Acoustic Settings from SE Subwoofer” – this pulls all Stored Settings from the subwoofer’s memory and loads the values into the currently running Setup. NOTE: Settings will be read over the loaded setup file and original settings will be overwritten when save. Use “Save As” to keep the original setup file.

MANAGING SYSTEM SETUPS

A system setup contains information about

- The loudspeakers in the system setup
- How the audio channels have been assigned in the cables
- The input and output configurations of each loudspeaker
- The acoustic settings for each loudspeaker

The System Setup is saved as a .gse file extension and by default is saved into the location C:\Documents and Settings*user_name*\Genelec\GLM_SE\Setup Files (Windows XP), C:\Users*user_name*\Genelec\GLM_SE\Setup Files (Windows Vista), or in ~/Documents/Genelec/GLM_SE/ (Macintosh).

user_name = Login user name

A System Setup file is created as a result of running the System Setup Wizard. Acoustic settings can be added in the System Setup file by running the Acoustic Wizard. It is possible also to manually edit the settings by using the System Editor tools. To access System Setup Editor, click “SE System Setup” button.

Saving and Recalling Setups

The basic way to save system setups is to use the GLM.SE™ main window “File | Save” or “File | Save As…” commands.

The basic way to recall system setups is the “File | Open” command.

Additionally, the GLM.SE™ asks the user to save the settings into a System Setup file after changes have been made in the system’s settings by using the System Setup Editor. A dialog for saving changes will appear when this happens.

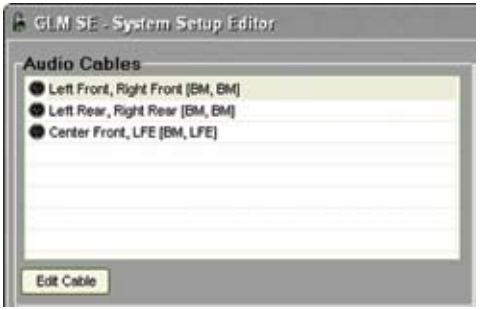
To create a System Setup file with a new name, use the “Save As…” menu item to save the setup. After that, make the desired changes in this new System Setup file.

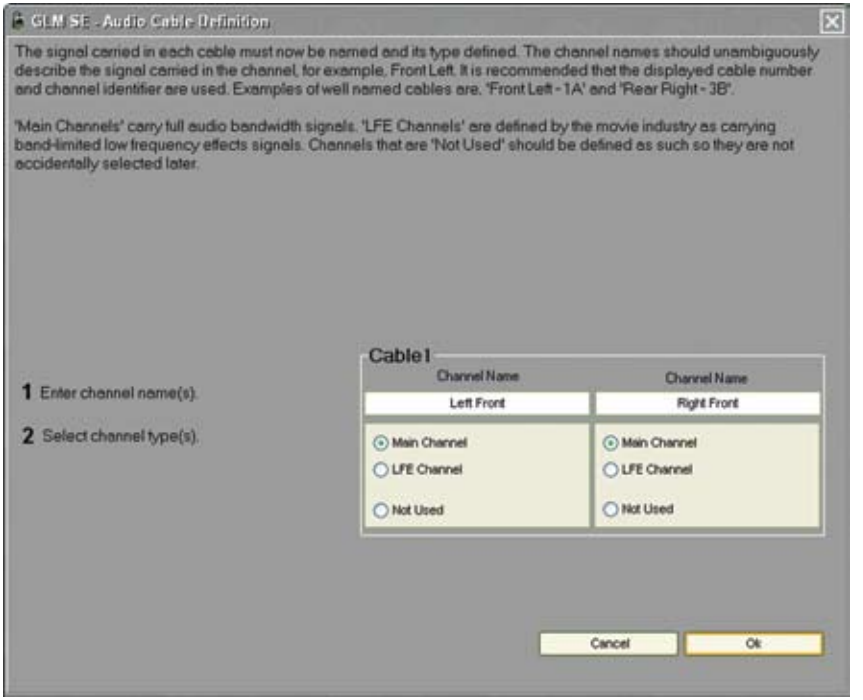
The System Setup Editor is divided into three main areas to:
- Edit the properties of audio cable definitions
- Create, remove and edit Group definitions
- Edit acoustical and input settings for loudspeakers or subwoofers

Editing Audio Cabling Definitions

Audio cables can be edited for purposes of re-labeling the cable or identifying its function.

The “Edit Cable” button opens the cable definition editor page to edit the selected cable. This would be used for example if you forgot to identify during the Manual Cabling Wizard a cable as carrying an LFE channel.





Editing Group Definitions

A Group is a set of audio channels playing simultaneously. Note that one or more loudspeakers may be reproducing one audio channel, and one or more audio channels may be reproduced by one loudspeaker, so it is important to understand that Groups are a collection of audio channels, not just Groups of loudspeakers. Groups can be added, copied, edited or deleted.

The “Add Group” button creates a new Group definition to the System Setup file. By default all channels are active in the new Group.

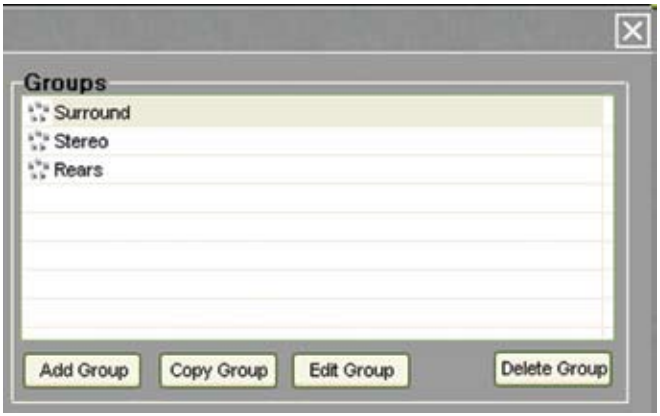
The “Copy Group” button creates a new Group definition to the System Setup file with the same content as the currently selected Group definition.

The “Edit Group” button opens a Group definition editor for modifying the selected Group.

The “Delete Group” button deletes the selected Group. There must be at least one Group in a System Setup file.

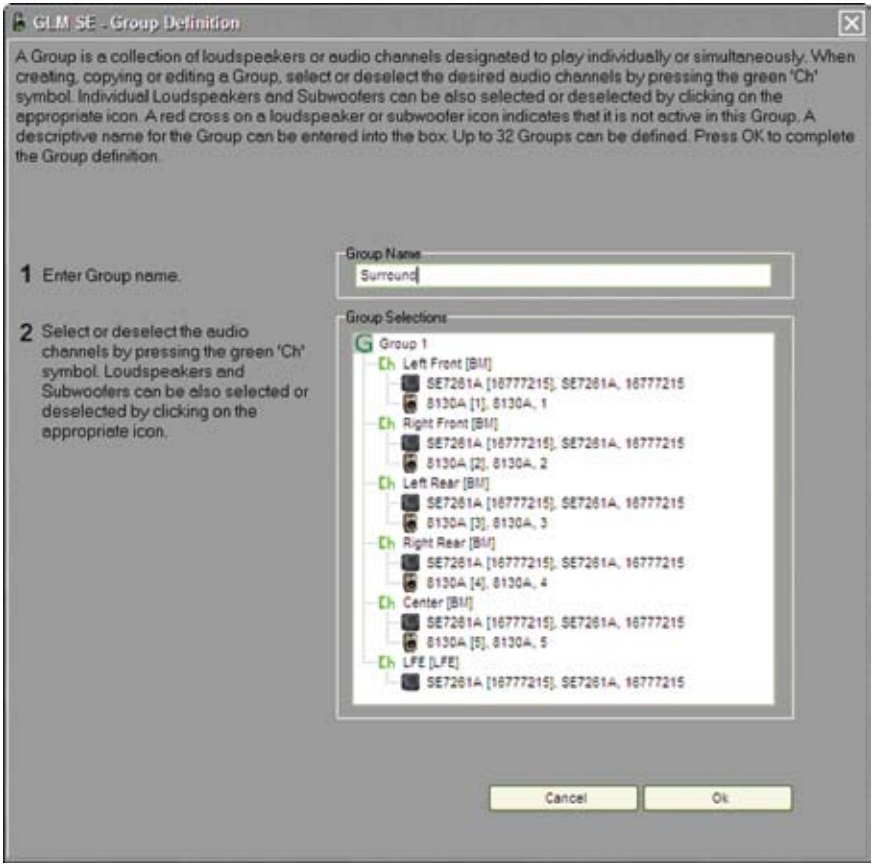
The Group definition editor provides step-by-step instructions when creating a new Group definition. The default setting when creating a new Group is that all audio channels are selected and all loudspeakers are playing.

To modify the Group, click on the audio channel nametags. This excludes (marked by a red “x’) all loudspeakers reproducing this audio channel. It is also possible also click on the individual loudspeakers



to exclude them from reproducing this audio channel. This allows editing of reproduction Groups on the audio channel or loudspeaker level.

Finally, click “OK” to accept the changes. A question will be presented about saving the modified Group definition in the currently active System Setup file.



Replacing and Removing Loudspeakers in a System Setup File

GLM.SE™ supports a situation where the SE7261A has changed. When one SE7261A is replaced with a new one, from the GLM.SE™ point of view, the old subwoofer has disappeared and the new subwoofer has appeared, but it still does not belong to the currently defined system.

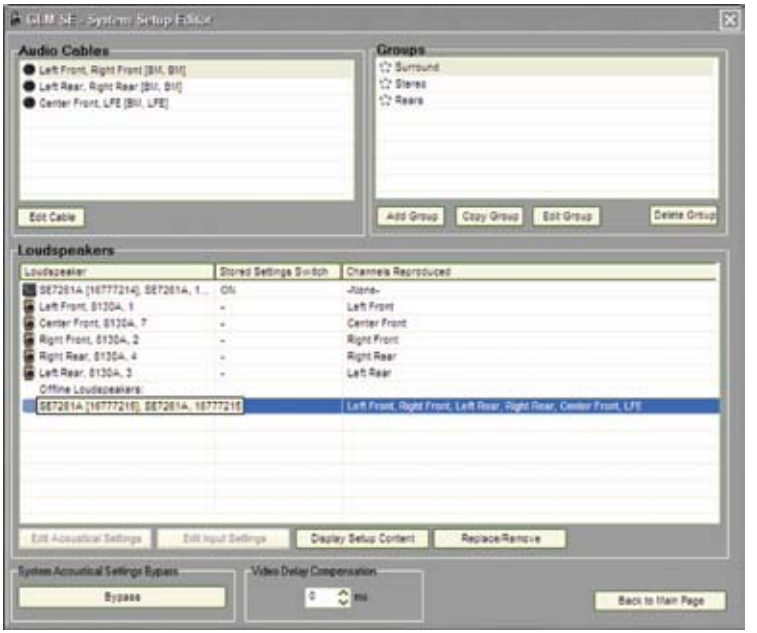
The SE7261A is identified with a unique identifier number. This ID number is recorded in the System Setup file.

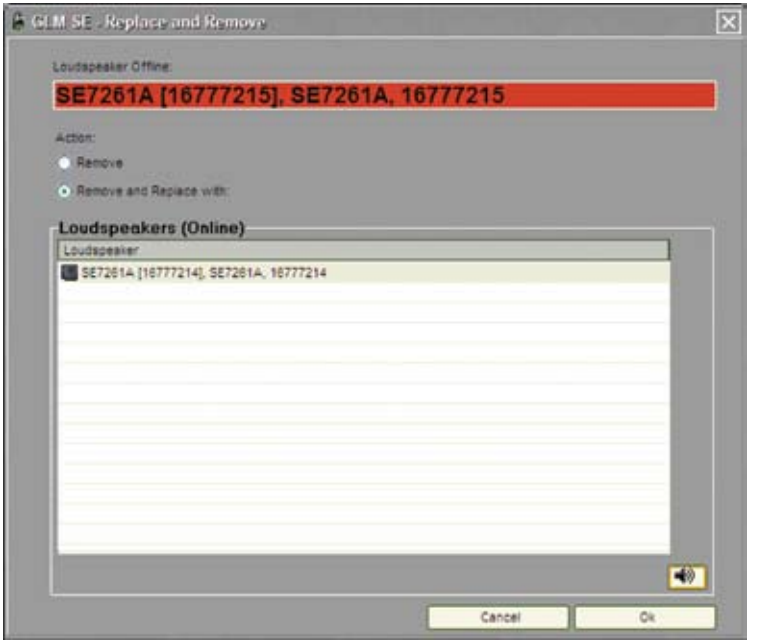
When there is a SE7261A definition in the System Setup, but this subwoofer is no longer found on the network, it is moved to the bottom of the list and identified as an Offline Loudspeaker along with all the 8130s. When this occurs, the GLM.SE™ activates the “Replace/Remove” button at the bottom of the System Setup Editor page.

When the ID number recorded in the System Setup file does not match the ID number of the SE7261A on the GLM.SE™ Control Network, the Replace/Remove tool must be used. Replacing a SE7261A with a new one means that the subwoofer’s settings are permitted to be written to the new SE7261A. This process is useful if a subwoofer breaks and is temporarily or permanently replaced with a new unit.

To replace a SE7261A

- Click the SE7261A definition that no longer is associated with a loudspeaker on the network.
- Click the “Replace/Remove” button. This opens the replace/remove editor.
- In the Replace/Remove editor, displayed at the top, is the loudspeaker to be replaced. At the bottom is a list of the available but unassigned loudspeakers.
- In the Offline Loudspeakers area, the SE7261A model is shown along with its given name and unique identifier number.
- To replace this subwoofer with another one available on the network, click on the SE7261A listed in the bottom table titled “Loudspeakers (Online)”. The selected subwoofer will flash its front panel light and the ID tone will play.
- Before clicking “OK”, check that the “Remove and Replace with” option has been selected as the “Action”.
- Click “OK” to perform the replacement.


Audio Cables
Left Front, Right Front [Bit, Bit]
Left Rear, Right Rear [Bit, Bit]
Center Front, LFE [Bit, LFE]
Edit Cable
Groups
Surround
Stereo
Rears
Add Group
Copy Group
Edit Group
Delete Group
Loudspeakers
Loudspeaker
Stored Settings Switch
Channels Reproduced
SE7261A [16777214], SE7261A, 1...
ON
-None-
Left Front, 8130A, 1
Left Front
Center Front, 8130A, 7
Center Front
Right Front, 8130A, 2
Right Front
Right Rear, 8130A, 4
Right Rear
Left Rear, 8130A, 3
Left Rear
Offline Loudspeakers:
SE7261A [16777215], SE7261A, 16777215
Left Front, Right Front, Left Rear, Right Rear, Center Front, LFE
Edit Acoustical Settings
Edit Input Settings
Display Setup Content
Replace/Remove
System Acoustical Settings Bypass
Bypass
Video Delay Compensation
ms
Back to Main Page


GLM SE - Replace and Remove
Loudspeaker Offline:
SE7261A [16777215], SE7261A, 16777215
Action:
Remove
Remove and Replace with:
Loudspeakers (Online)
Loudspeaker
SE7261A [16777214], SE7261A, 16777214
Cancel
Ok

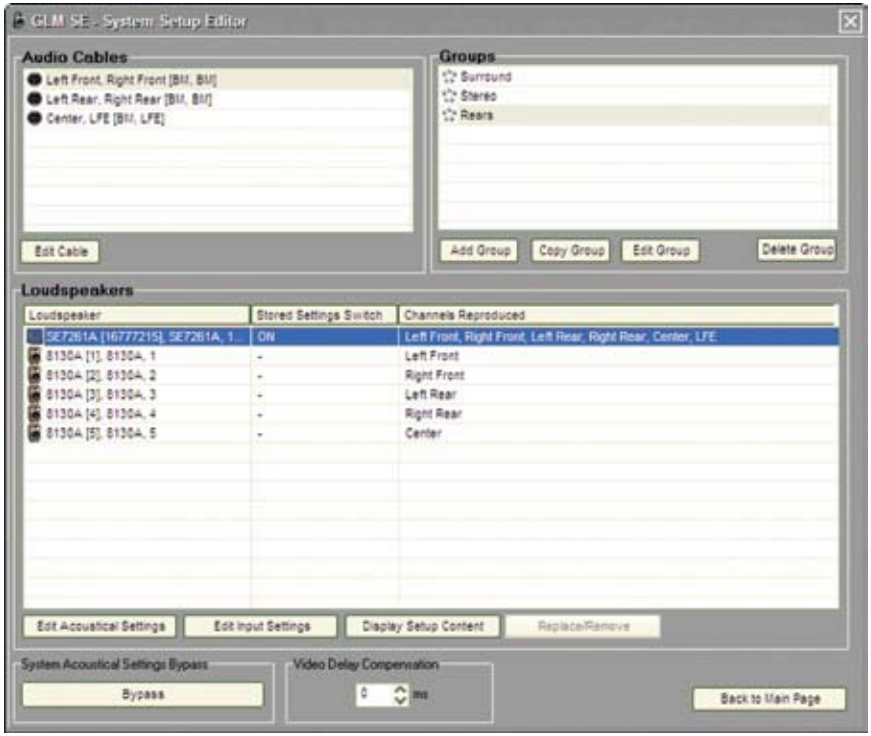
EDITING ACOUSTIC CALIBRATIONS

The GLM.SE™ software contains a versatile set of controls to edit the acoustic setup of a loudspeaker or subwoofer. Changing these acoustical controls is strongly discouraged unless there is access to a properly set up professional acoustic measurement system, for example, MLSSA or WinMLS. Adjusting the acoustic calibration “by ear” will most likely result in a degradation of audio quality.

Opening the Acoustical Settings Editor

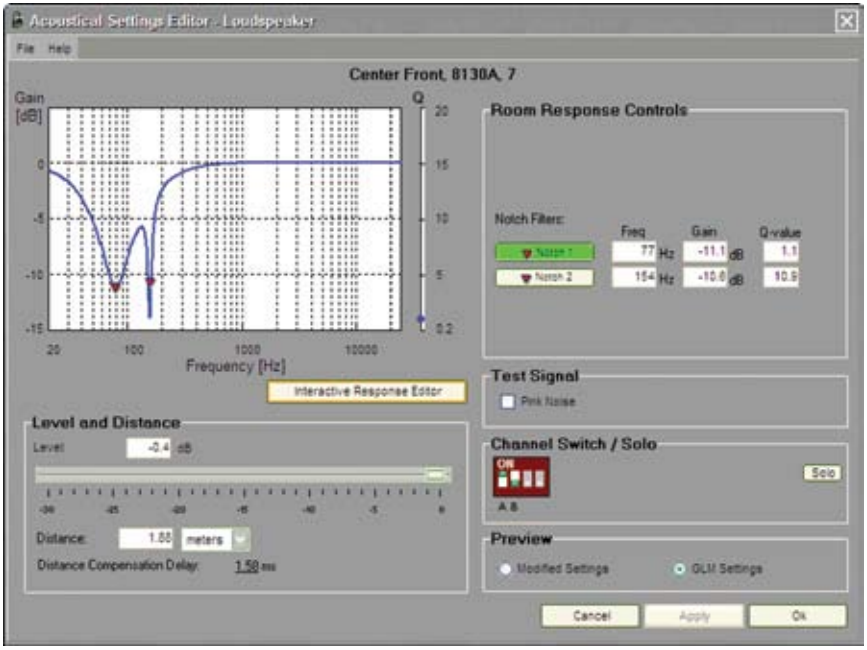
The Acoustical Settings Editor can be accessed as follows:

- In the GLM.SE™ main window, click the “GLM.SE™ System Setup” button, or select the menu item “Setup | GLM.SE™ System Setup”.
- Now select a loudspeaker in the “Loudspeakers (Online)” panel seen in the lower half of the System Setup window.
- Click the “Edit Acoustic Settings” button or double click on loudspeaker (loudspeaker column) and the “Acoustical Setup” will open for that loudspeaker. Note that the appearance of the Acoustical Setup Editor window depends on the loudspeaker type.



8130A Loudspeakers

The Acoustical Settings Editor for the 8130A loudspeaker high pass outputs looks like this:

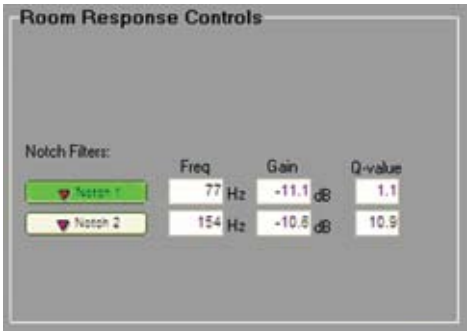


It contains the following functionality:

- **Room Response Controls:** Provides access to the controls that affect the frequency response of the 8130s. These are a versatile set of controls especially designed for in-situ loudspeaker equalization.
- **Level and Distance Controls:** Allows for alignment of this loudspeaker into a system of loudspeakers.
- **Test Signal Section:** Provides a pink noise signal generated for the loudspeaker for test and measurement purposes.
- **Preview Control:** selects between two control sets – the control set at the time the Acoustical Settings Editor (GLM.SE™ Settings) was opened or the settings that have been made since the Acoustical Settings Editor was opened (Modified Settings).

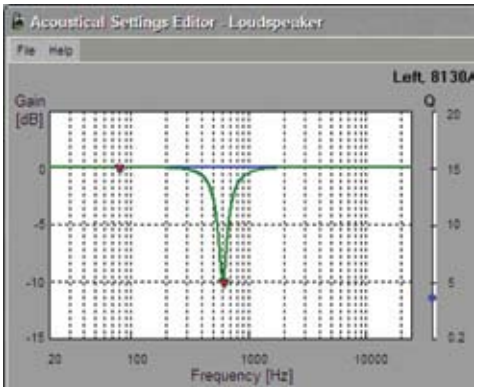
Room Response Controls

The second-order notch filters are designed to change the finer detail of a loudspeaker's response. Each notch filter has three parameters; center frequency, gain and Q-value. Gain controls the depth of the notch (negative gain only) and Q-value refers to how wide the notch is relative to its center frequency. A narrow notch has a high Q-value, whereas a wide notch has a low Q-value. A filter can be selected by clicking on the filter's button. The button changes to a green color and a cursor is added to the graph to indicate the corresponding filter icon. Values can be written directly into the parameter boxes. Values outside the permissible range are automatically changed to the maximum or minimum allowed as appropriate. Manually entering many parameter values is tedious, so it is also possible to quickly drag the small triangular icons, and the associated Q-value slider for notches, in the graphical filter response window.



Note that the original filter settings are depicted with a blue line and the modified settings with a green line. These two filter sets can be compared using the "Preview" function.

For example, to set a notch at 600 Hz with a gain of –10 dB, first put the mouse pointer on one of the notch triangle icons, press down the left mouse key, and move the mouse to adjust the notch frequency and gain.

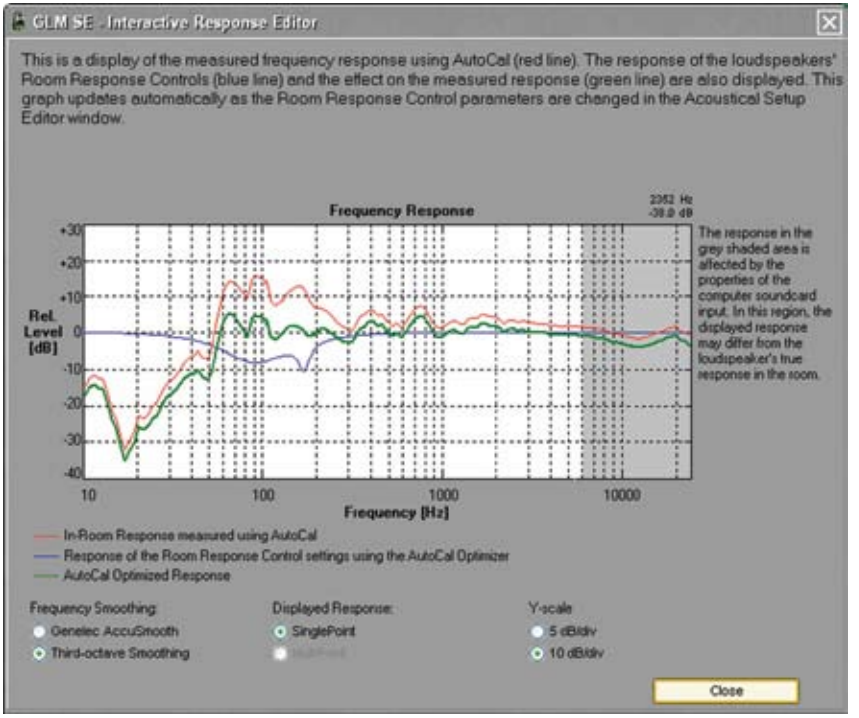


Then place the mouse cursor on the blue Q-value icon, press down the left mouse button and drag to adjust the Q-value to 5. The Q-value to be adjusted now depends on which notch filter was selected. To adjust the Q-value of a specific filter, click on one of the notch filter triangle icons or click on the selection button in the parameter table.

Interactive Response Editor

If an AutoCal™ measurement (SinglePoint or MultiPoint) of the loudspeaker has been taken, the "Interactive Response Editor" button is visible. When clicked, the "Interactive Response Editor" window is displayed. It displays the in-room response measured by AutoCal™ and shows how the current Acoustical Settings modify the response.

The Acoustical Settings (Room Response Controls and Level) can be changed interactively in order to see the effect on the measured response. This facility allows for inspection of the effect of the current Acoustical Settings and may be used after running AutoCal™ to make controlled adjustments to the parameters. The 0 dB level in the acoustic response plot is the reference level set by AutoCal™ and is consistent across all loudspeakers and subwoofers in a system. Any changes to the controls mentioned above will change the filtered response curve relative to the 0 dB level.

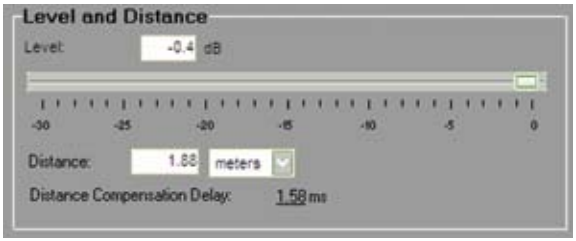


Level and Distance

These controls align the loudspeaker into a system of loudspeakers.

Adjusting the loudspeaker output level changes the relative sensitivity of the loudspeaker, thereby permitting the alignment of the loudspeaker to the same level as the other loudspeakers and subwoofers on the GLM.SE™ Control Network.

Enter the physical distance of the loudspeaker from the primary listening location into the “Distance” box. The unit of measurement can be selected as preferred by the user and the applied delay is automatically calculated and displayed. The displayed delay value is the amount time delay required to compensate for the addition distance of this loudspeaker on the GLM.SE™ Control Network relative to the nearest loudspeaker in the system. The delay will be 0 ms if this loudspeaker has the longest entered distance.



Test Signals

Test: This section provides a pink noise signal generated inside the loudspeaker for measurement and testing purposes. Pink noise can be used in level alignment with the aid of a sound level meter, and for example to locate a loudspeaker on the GLM.SE™ Control Network.

Channel Switch/Solo

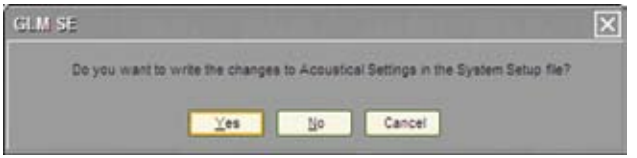
The “Solo” button mutes all the other loudspeakers being processed by the SE7261A. The solo function is useful for measurement and calibration purposes. The solo state is automatically reset when closing the Acoustical Settings Editor window.

Preview

This control offers a choice between two control sets – the control set at the time the Acoustical Settings Editor was opened (“GLM.SE™ Settings”) or the settings that have been made since Acoustical Settings Editor was opened (“Modified Settings”). This can be used to audition existing and new settings that may have been made.

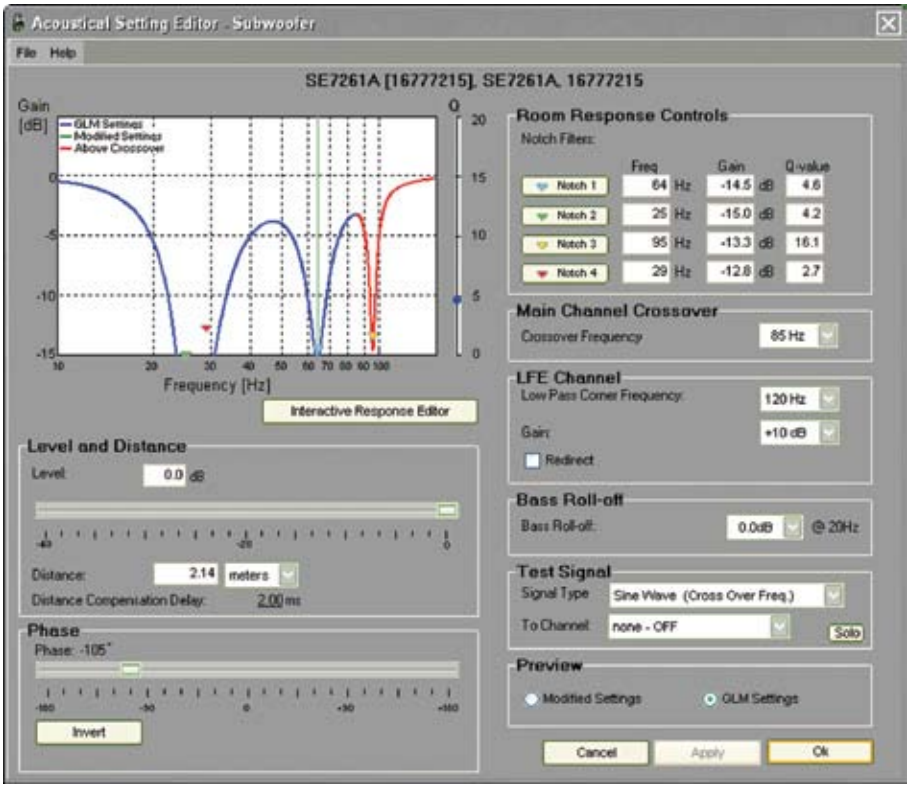
Saving the settings into a System Setup File

When the adjustments have been completed, press “Ok” and the GLM.SE™ asks if the new settings can be saved in the currently open System Setup File. If “Yes” is pressed, the newly edited settings are saved, “No” discards the changes and “Cancel” returns back to the Acoustical Settings Editor so more changes can be made.



SE7261A Subwoofer

The Acoustical Settings Editor for a SE7261A subwoofer looks like this:



It contains the following functionality:

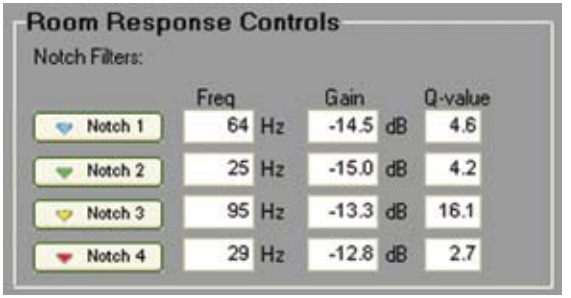
- **Room Response Controls:** Provides access to the controls inside the subwoofer that affect the frequency response. These are a versatile set of controls especially designed for in-situ loudspeaker equalization.
- **Level and Distance controls:** Allows for alignment of this subwoofer into a system of loudspeakers.
- **Phase:** Adjusts the subwoofer's phase at the crossover frequency.
- **Main Channel Crossover:** Selects the subwoofer crossover frequency.
- **LFE Channel:** Defines how the LFE channel is handled.
- **Bass Roll-Off:** This control reduces the level near the lower cut-off frequency of the subwoofer relative to the pass-band of the subwoofer.

- **Test Signal Section:** Provides a pink noise or sine wave signal generated inside the subwoofer for test and measurement purposes. Some test signals are intended to be reproduced by the subwoofer(s) and some by the other loudspeakers on the GLM.SE™ Control Network.
- **Preview Control:** selects between two control sets – the control set at the time the Acoustical Settings Editor (GLM.SE™ Settings) was opened or the settings that have been made since the Acoustical Settings Editor was opened (Modified Settings).

Room Response Controls

The Room Response Controls section provides access to the equalizer inside the subwoofer.

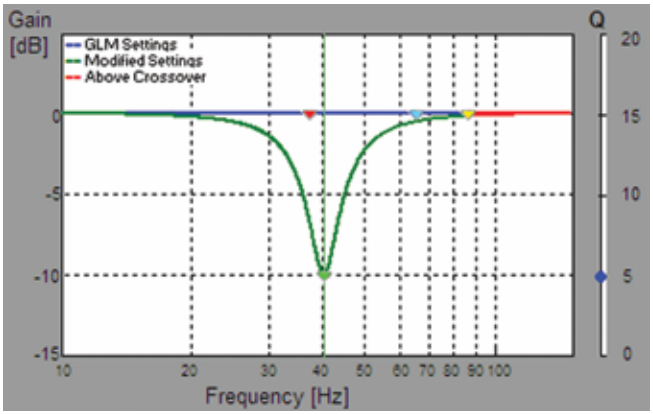
There are four second-order notch filters available and each has three parameters; center frequency, gain and Q-value. Gain controls the depth of the notch (negative gain only) and Q-value refers to how wide the notch is relative to its center frequency. A narrow notch has a high Q-value, whereas a wide notch has a low Q-value. High Q-values are possible for precise modal compensation tasks.



A filter can be selected by clicking on the filter's button. The button changes to a green color and a cursor is added to the graph to indicate the corresponding filter icon. Values can be written directly into the parameter boxes. Values outside the permissible range are automatically changed to the maximum or minimum allowed as appropriate. Manually entering many parameter values is tedious, so it is also possible to quickly drag the small triangular handles, and the associated Q-value slider for notches, in the graphical filter response window.

Note that the original filter settings are depicted with a blue line and the modified settings with a green line. These two filter sets can be compared using the "Preview" function.

For example, to set a notch at 40 Hz with gain of –10 dB and a Q-value of 5, first put the mouse pointer on one of the notch triangle icons, press down the left mouse key, and move the mouse to adjust the notch frequency and gain. Then place the mouse cursor on the blue Q-value icon, press down the left mouse button and drag to adjust the Q-value to 5. The result of this exercise can be seen in the graph below.



Interactive Response Editor

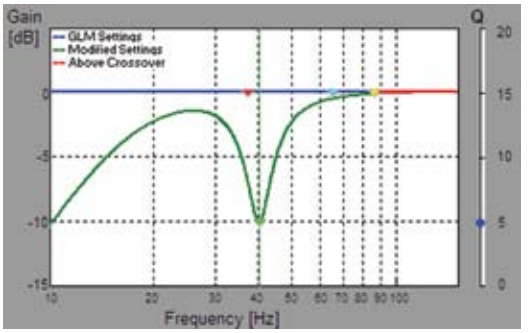
If an AutoCal™ measurement (SinglePoint or MultiPoint) of the subwoofer has been taken, the “Interactive Response Editor” button is visible. When clicked, the “Interactive Response Editor” window is displayed. It displays the in-room response measured by AutoCal™ and shows how the current Acoustical Settings modify the response.

The Acoustical Settings (Room Response Controls, Level and Bass Roll-Off) can be changed interactively see the effect on the measured response. This facility allows for inspection of the effect of the current Acoustical Settings and may be used after running AutoCal™ to make controlled adjustments to the parameters. The 0 dB level in the acoustic response plot is the reference level set by AutoCal™ and is consistent across all loudspeakers and subwoofers in a system. Any changes to the controls mentioned above will change the filtered response curve relative to the 0 dB level.

Bass Roll-Off

This control reduces the level near the low corner frequency of the subwoofer relative to the passband of the subwoofer. A Bass Roll-Off attenuation value is selected from a drop-down box. The dB-value shown is the attenuation at the low frequency cut-off of the subwoofer.

The Bass Roll-Off control can be used in combination with the notch filters and its effect can be seen in the frequency response graph and in the Interactive Response Editor. An example can be seen below, for a Bass Roll-Off setting of –2 dB combined with a single notch filter set to 60 Hz, -10 dB and Q-value 5.



Level and Distance

These controls align the subwoofer into a system of loudspeakers. Adjusting the subwoofer output level changes the relative sensitivity of the subwoofer, thereby permitting the alignment of the subwoofer to the same level as the other loudspeakers and subwoofers on the GLM.SE™ Control Network.

Enter the physical distance of the subwoofer from the primary listening location into the “Distance” box. The unit of measurement can be selected as preferred by the user.

Since a subwoofer has mechanical, acoustical and electronic sources of delay, usually a subwoofer has a delay longer than a loudspeaker. The GLM.SE™ does not attempt to compensate the delay in the

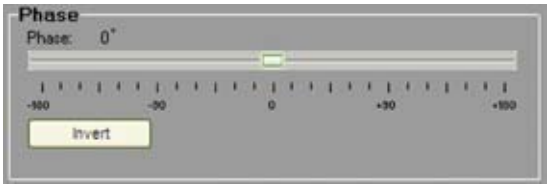
loudspeakers to be equal to the delay of a subwoofer, because doing so would result in excessively long delays for the loudspeakers. Instead, the subwoofer phase at the crossover frequency is aligned with the phase of a reference loudspeaker. The reference loudspeaker is typically the left or right loudspeaker in a 5.1 system or a two-channel stereo system.

Crossover Phase Alignment

This control adjusts the subwoofer's phase at the Main Channel Crossover frequency and is implemented using a short time delay. The distance and phase information are combined by the GLM.SE™ into a single delay value applied to the subwoofer feed. The phase control can be set automatically using AutoPhase in AutoCal™, or manually as described below.

The "cancellation method" is recommended for manual calibration of the subwoofer phase:

- Turn on the "sine wave" test signal and direct it to the audio channel that will be used as the reference loudspeaker. It is recommended that the left or right loudspeaker is used in a two-channel or multichannel system.
- A sinusoidal (i.e. single-frequency) signal should be heard from the selected reference loudspeaker and the subwoofer.
- Adjust the "Phase" slider to find the lowest sound level when seated at the primary listening position. This occurs when the sound from both devices is exactly out of phase. This can be measured using a sound level meter set to "C-weighting" and "Slow" or simply by listening.
- Now click the "Invert" button and the sound level will increase. The subwoofer is now in phase with the reference loudspeaker.



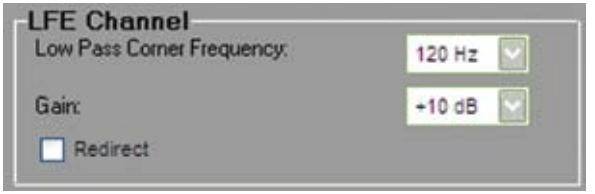
Crossover Frequency Selections

This control allows the crossover frequency for the full bandwidth (main) audio channels to be chosen. It is recommended that the crossover frequency is set to 85 Hz (default). The reasons are mainly acoustic and relate to typical listening conditions. This value is a good trade-off between the following factors:

- Loudspeakers are to produce the highest output sound level with low distortion by removing the very low frequencies in their signal feed.
- Loudspeakers couple less to modal resonances in the room thereby improving audio quality.
- Integration of the subwoofer(s) to the rest of the system is better when the subwoofer does not produce high bass frequencies.

Conversely, there may be good reasons to select a higher or lower crossover frequency, but it is recommended that good quality acoustical measurements are conducted before adjusting this control.

LFE Channel Low Pass Corner Frequency. Low pass corner frequency of 120 Hz is recommended for the LFE channel input as this is a widely accepted industry standard. There may be reason to select another low pass corner frequency for certain applications.



LFE Channel Gain. The correct value for this control depends on the audio source. Select "+10 dB" if the audio source outputs the LFE channel at the same level as the main channels. This results in the LFE channel's audio being boosted by 10 dB in the subwoofer. If the audio source already outputs the LFE audio 10 dB higher than the main channels, select "0 dB".

LFE Channel Redirect. LFE channel redirection defines how audio content in the LFE channel is handled.

If LFE redirection is not selected, audio content on the LFE channel above the "LFE channel low pass corner frequency" is not reproduced. This is useful for "pre-filtering" the LFE channel. It is recommend that mixes are checked with an 80 Hz low pass filter on the LFE to ensure uniformity of reproduction by different consumer and professional processors.

If LFE redirection is selected, audio content in the LFE channel above the "LFE channel low pass corner frequency" is redirected to another loudspeaker. This allows all audio content in the LFE content to be heard. The LFE audio signal is filtered at the frequency set in the "LFE channel low pass corner frequency" and so it is recommended that this control set to 85 Hz or less. In the subwoofer, content above this frequency is summed to the other AES/EBU channel of Output 4. It is recommended that this subwoofer AES/EBU output. This results in the subwoofer reproducing audio content below the "LFE channel low pass corner frequency" and center loudspeaker reproducing the audio content above the "LFE channel low pass corner frequency".

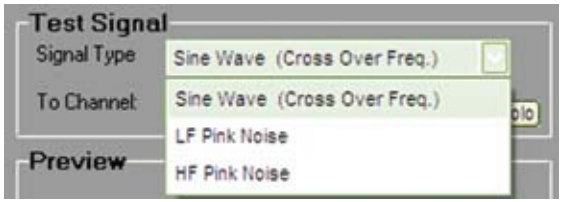
Test Signal Generators

This section provides test signals generated in the subwoofer for measurement and testing purposes. Some test signals are intended to be reproduced by the subwoofer(s) and some by loudspeakers. The

generated signal can be connected to one of the inputs in the subwoofer instead of having to use an actual audio input signal. Therefore only those inputs that have been specified to be active in a subwoofer can be selected.

To use the test signals:

- Select the signal in the “Signal Type” drop-down box.
- Direct the signal to the required subwoofer input channel.



Preview

This control offers a choice between two control sets – the control set at the time the Acoustical Settings Editor was opened (“GLM.SE™ Settings”) or the settings that have been made since Acoustical Settings Editor was opened (“Modified Settings”). This can be used to audition existing and new settings that may have been made.

Storing Acoustic Settings in Subwoofer Memory

The acoustic settings stored in the System Setup File can be uploaded into the subwoofer’s memory. This allows the subwoofer to be used in Stand-Alone mode with the same Acoustical Settings as the GLM.SE™. The settings stored in the subwoofer’s memory can also be downloaded into the GLM.SE™. For more details about this, see the section on Stand-Alone Operation.

Saving the settings into a System Setup File

When the adjustments have been completed, press “Ok” and the GLM.SE™ asks if the new settings should be saved in the currently open System Setup File. If “Yes” is pressed, the newly edited settings are saved, “No” discards the changes and “Cancel” returns back to the Acoustical Setup window so more changes can be made.

Using the Interactive Response Editor

This tool is available once AutoCal™ has been run. AutoCal™ measures the acoustical frequency responses of all the loudspeakers and subwoofers on the GLM.SE™ Control Network. The Interactive Response Editor allows the user to:

- See the frequency response measured using AutoCal™.
- Immediately see the effect of adjusting the Acoustical Settings on the in-room frequency response

To enter the Interactive Response Editor:

- AutoCal™ must have previously run and been saved in the Setup to acquire a measurement of the in-room frequency response of the loudspeakers and subwoofers on the GLM.SE™ Control Network (this enables the Interactive Response Editor).
- Enter the GLM.SE™ System Setup by pressing the “GLM.SE™ System Setup” button in the main window. Then select a loudspeaker to be adjusted and click the “Edit Acoustical Settings” button.
- Below the frequency response graph is a button labeled “Interactive Response Editor”. Pressing this opens a new window that displays the acoustical response measured by AutoCal™. It also shows how the current Acoustical Settings modify the measured response.

Moving the focus back to the Acoustical Settings Editor window allows the Acoustical Settings to be changed. The effect of any changes can be seen in the responses displayed in the Interactive Response Editor window. This tool makes it very easy to implement precise and controlled adjustment to a loudspeaker’s or subwoofer’s acoustical response. Remaining problems in the response can be identified and evaluated.

The default display setting is a third-octave smoothing allowing easy comparison with other measurement system results. Alternatively, a high-resolution frequency-dependent smoothing window called Genelec AccuSmooth displays a high-resolution response at low frequencies whilst removing excessive detail at mid and high frequencies.

The default vertical axis display setting is a 10 dB/division resolution. The 5 dB/division setting is for zooming into the detail of the acoustic response when editing the equalizer settings.

It is also possible to toggle between the “SinglePoint Response” and the “MultiPoint Response”. This permits comparison between the effect of the Acoustical Settings at the primary listening position and the effect of the same settings over the MultiPoint measurement area.

STAND-ALONE OPERATION

Most consoles have analog monitor sections, whereas some have digital monitor sections. Analog monitor sections are controlled using a volume potentiometer. Most advanced digital audio workstations have digital audio outputs that can be controlled using a fader on the screen or using a separate hardware device. Some systems even allow digital audio levels to be controlled via MIDI devices.

8130A Connectors and Controls

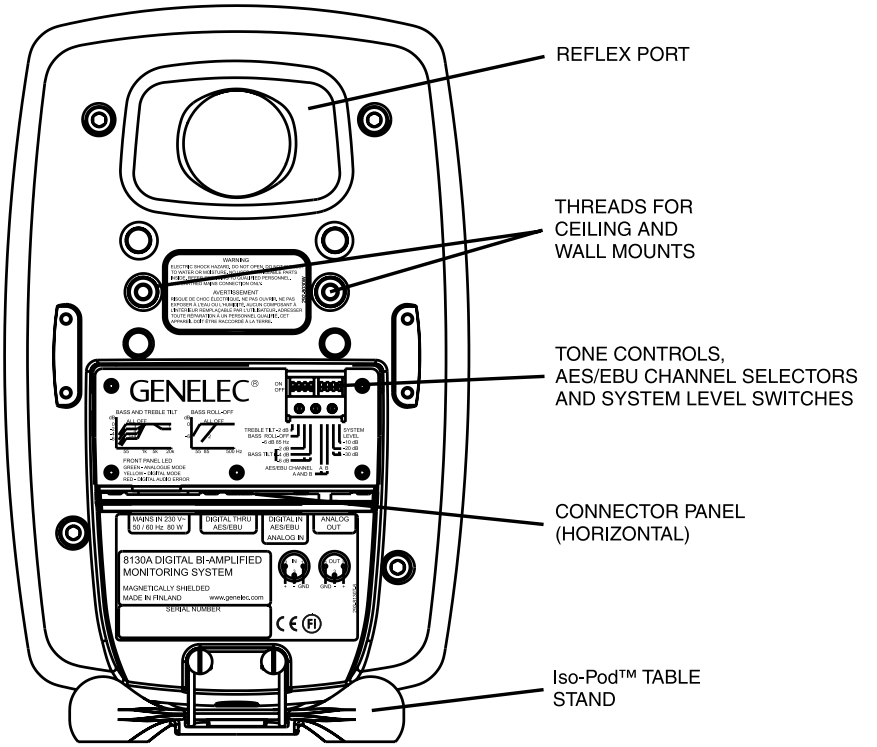
There is a row of eight switches on the back panel of the loudspeaker and a rotary level control on the front panel allowing the set up of the 8130A for stand-alone operation. See overleaf for the back panel layout of the 8130A.

The first four switches from the left contain the room response corrections.

For a detailed description and instructions on the use of these switches, consult the 8130A Loudspeaker Operating Manual that comes with each loudspeaker.

The second four switches contain the system setting switches.

AES/EBU CHANNEL. This selects the audio channel(s) available on the AES/EBU cable to be reproduced by the loudspeaker. Turning both switches on reproduces the sum of the two channels on the AES/EBU cable. Turning both switches off has the same effect which has been done deliberately to avoid the situation where no input channel is selected and the loudspeaker is effectively muted. When two channels are selected, the two channels are summed together.



SYSTEM LEVEL. These switches allow scaling down of the loudspeaker output. The signal sent to the "Thru" output connector is not affected. The switches are additive, for example, "–30 dB" attenuation is achieved by turning on the "–10 dB" and "–20 dB" switches. The effect of these switches is combined with the effect of the rotary level adjustment control. When using the GLM.SE™ software volume control, set all switches to "OFF" and turn the level adjustment knob fully clockwise.

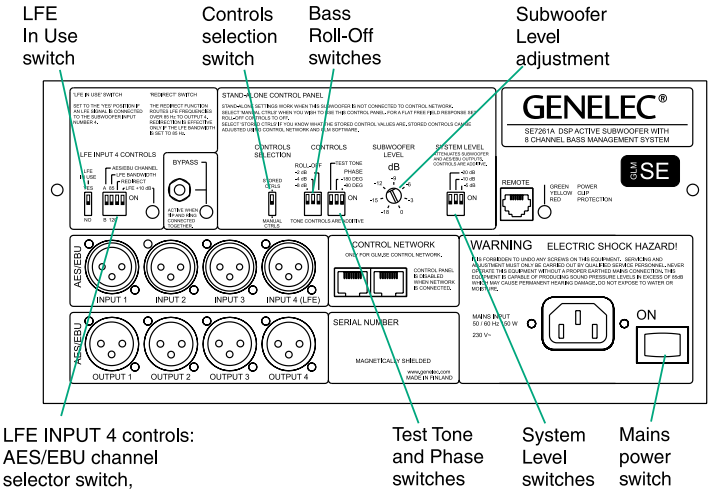
For a detailed description and instructions on the use of these switches, consult the 8130A Digital Loudspeaker Operating Manual.

Even if the digital source can control the digital level, it may still be advantageous to lower the sensitivity either with the GLM.SE™ or the "SYSTEM LEVEL" controls of the SE7261A subwoofer. This will enable the use of the upper end of the digital level controller.

SE7261A Connectors and Controls

The SE7261A subwoofer supports digital audio only.

Illustrated below is the connector panel of the SE7261A subwoofer. In the bottom left corner are the AES/EBU digital audio inputs and outputs. The subwoofer has four AES/EBU inputs and four AES/EBU outputs.



The SE7261A can perform bass management. The DSP bass management system 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 loudspeakers connected to the outputs of the subwoofer. Frequencies above the cross-over frequency from input 1 are directed to output 1, frequencies above the cross-over frequency from input 2 are directed to output 2 and so on. In a practical example, a cable carrying Left and Right signals is connected first to INPUT number 1 on the subwoofer and then the OUTPUT number 1 is connected to Left and Right loudspeakers. For bass management to work, the subwoofer must be first in the audio chain but after that the loudspeakers can be connected in any order.

All digital audio inputs and outputs are referenced to 0 dBFS (digital Full Scale, the largest possible signal that can be represented by an AES/EBU signal). Genelec GLM.SE™ system loudspeakers produce a sound pressure level of 100 dB SPL (at one meter distance in free space) for a digital input signal of –15 dBFS.

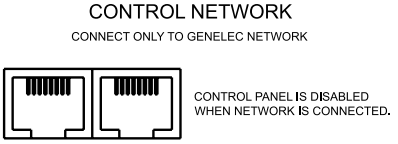
Connector Panel Details

Controls selection. The SE7261A subwoofer works in stand-alone mode when the GLM.SE™ control network is not connected. The “CONTROLS SELECTION” switch allows selection between two basic methods to control a subwoofer in stand-alone mode.

“MANUAL CTRLS” refers to controlling the subwoofer using the controls on the subwoofer’s connector panel.

“STORED CTRLS” refers to using the settings stored inside the memory of the subwoofer. These settings can be set using the GLM.SE™ and the GLM.SE™ control network. The stored settings provide additional functionality compared to the basic controls on the panel.

GLM.SE™ Control Network. To the right of the digital audio inputs are two RJ45 connectors for the GLM.SE™ Control Network. Acoustic settings can be edited and stored into the subwoofer using the GLM.SE™ and the GLM.SE™ Control Network connection. For more information about the use of the GLM.SE™ Control Network, see the section Acoustic Setup Wizard which explains the editing of Acoustical Settings using the GLM.SE™ and the section Genelec AutoCal™ which explains using AutoCal™ with subwoofer(s).

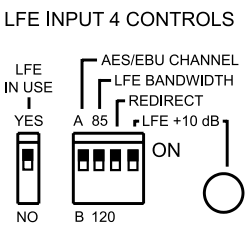


When the GLM.SE™ Control Network is connected, or when the “CONTROLS SELECTION” switch is in the “STORED CTRLS” position, some of the controls on the subwoofer’s connector panel may be disabled. They are disabled because the subwoofer is being controlled through the GLM.SE™ Control Network, or by the settings stored inside the memory of the subwoofer. If a disabled control on the panel is adjusted, all the lights on the connector panel flash rapidly to inform that it is disabled and that the change has no effect.

Stand Alone Controls (Manual)

In Stand-Alone Mode (when the GLM.SE™ Control Network is not connected) the controls on the subwoofer’s panel are used to setup the subwoofer. In the following sections the controls available on the connector panel are explained.

LFE Controls. Some multi-channel formats have a Low Frequency Effects (LFE) channel. This signal must be connected to the LFE input (INPUT 4) to enable the DSP subwoofer to correctly reproduce all the bass information in the mix. The “LFE INPUT 4 CONTROLS” section controls the way the LFE signal presented to INPUT 4 is handled.



If no LFE signal is connected, then the “LFE IN USE” switch should be set to the “NO” position so that INPUT 4 can work in the same way as the other inputs.

If an LFE signal is connected, then the “LFE IN USE” switch should be set to the “YES” position. The switches to the right of the “LFE IN USE” switch determine how the LFE signal is handled in the subwoofer. These switches are only effective when the “LFE IN USE” switch is in the “YES” position, otherwise they are ignored.

LFE sub-frame. An AES/EBU signal normally carries two audio channels in what are called sub-frames A and B. The “AES/EBU CHANNEL” switch selects if the LFE signal is carried in sub-frame A or B.

LFE bandwidth. The LFE input can be set to two frequency ranges: 19 to 85 Hz or 19 to 120 Hz using the “LFE BANDWIDTH” switch. Signal content in the LFE signal above the frequency value selected on the “LFE BANDWIDTH” switch is either not reproduced or is redirected (see below)

Redirect. Using redirection allows the LFE channel to be monitored as a full-bandwidth audio channel. If the LFE signal includes content higher than 120 Hz, it can be monitored using the “Redirect” function. This function allows rerouting of LFE signal above 85 Hz to the front center loudspeaker. This rerouted LFE content is known as the redirected LFE signal.

Setting the “REDIRECT” switch to the “ON” position activates the redirect function and it can only be activated if the “LFE BANDWIDTH” switch is set to “85”.

The redirected LFE signal is added to the audio signal contained in the other sub-frame of the AES/EBU audio cable connected to INPUT 4. Typically the LFE channel is paired with the Front Center channel, so one of the sub-frames of OUTPUT 4 carries the sum of the redirected LFE signal and the center channel signal. OUTPUT 4 should then be connected to the Front Center loudspeaker.

Subwoofer input 4		Subwoofer output 4	
Sub-frame A	Sub-frame B	Sub-frame A	Sub-frame B
Center signal	LFE signal	Center + redirected LFE signal	
LFE signal	Center signal		Center + redirected LFE signal

LFE +10 dB. In Dolby Digital and DTS encoding formats the LFE channel is monitored with +10 dB gain relative to the main channels. The object is to increase the headroom in the recorded signals. Surround sound decoders automatically add +10 dB of LFE gain to restore the level balance.

The “LFE +10 dB” function of the DSP subwoofers is designed to 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 or using the optional remote control activates the function. A yellow light next to the “LFE +10 dB” switch illuminates when the “LFE +10 dB” function is activated and +10 dB of gain is added to the LFE signal. If the audio source outputs the LFE signal at the same level as the other (non-LFE) signals and the LFE should be reproduced at a 10 dB higher level, set this control to “ON”. 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, DVD player, surround sound processor or the output matrix of the mixing console
- When producing an audio format that does not require the use of +10 dB gain on the LFE channel, such as DVD-Audio (MLP) and SACD (DSD).

NOTE: The state of the +10dB function is NOT stored with the Stored Settings data. This function must be remotely done when the Network is not controlling the 7261A. This provides the option of controlling the LFE boost without having to reconnect the network/computer.

Bypass. The “BYPASS” section allows the use of a standard Genelec remote bypass switch. This allows for remote control of the subwoofer’s bass management bypass function. The red “BYPASS” light is illuminated when the bypass mode is active.

With the bypass mode on, the high pass filters for the loudspeakers are disabled and the system behaves as if the subwoofer was not connected. The bypass function has no effect on the LFE signal. If there is no LFE signal, the subwoofer will not reproduce any signal when the bypass is active.

Stand-alone acoustical controls. The stand-alone controls for acoustical and level alignment of the subwoofer have been collected into a group at the top center section of the subwoofer's connector panel.

Acoustical controls. The acoustical response of the SE7261A subwoofer should be matched to the characteristics of the room in which it is placed. The group of switches titled "CONTROLS" allows the control of Roll-Off (the response for very low frequencies, around 20 Hz) and the crossover Phase. The "ROLL-OFF" and "PHASE" switches are additive, meaning that the sum of all the switches in the "ON" position gives the current setting. For example, to set the roll-off to –6 dB, turn on two switches, –2 dB and –4 dB, making a sum of –6 dB.

Incorrect phase alignment between the loudspeakers and the subwoofer causes a drop in the frequency response around the crossover frequency. The SE7261A subwoofer contains a tone generator for phase alignment. The "TEST TONE" switch activates the tone generator at the crossover frequency. The test tone signal is sent to OUTPUT 1 on AES/EBU sub-frame A.

Acoustic measuring equipment such as Genelec AutoCal™ accurately aligns the phase. Alternatively, the following quick phase alignment process can be done:

- Disconnect all loudspeakers from the subwoofer outputs.
- Select the loudspeaker to be used as the reference for the phase alignment. Typically, this is the Front Center loudspeaker in a 5.1 multi-channel system.
- Connect this loudspeaker to subwoofer output 1.
- Select sub-frame A for reproduction on the reference loudspeaker.
- The test tone is played simultaneously from the subwoofer and loudspeaker.
- Listen to the tone and adjust both "PHASE" control switches to find the setting that gives the minimum tone level at the listening position.
- After having found this minimum level setting, set the "-180 DEG" switch to the opposite setting to complete the setup. This puts the subwoofer in phase with the reference loudspeaker and completes the phase calibration.
- Finally, reconnect all loudspeakers to the subwoofer outputs.

The Phase and Bass Roll-Off adjustments should be performed individually for each subwoofer in the system.

Subwoofer level. The level of the subwoofer relative to the loudspeakers can be adjusted with the "SUBWOOFER LEVEL" rotary control. This control allows matching the subwoofer level to the levels of other loudspeakers in the system.

System level. The “SYSTEM LEVEL” switch group allows scaling the maximum sound level of the whole loudspeaker system. This control changes the subwoofer level as well as the levels of all loudspeakers connected to the subwoofer outputs.

Genelec DSP loudspeakers produce a sound level of 100 dB SPL at a distance of one meter in free space for a digital input signal of –15 dBFS (FS stands for “Full Scale” the largest possible AES/EBU signal level). The “SYSTEM LEVEL” switches can be used to reduce this sound level.

It may be necessary to use the “SYSTEM LEVEL” attenuation switches to ensure that high-level digital audio signals do not overload the loudspeaker system. The suitable setting also depends on the listening distance. The correct setting for this control depends on the program source and the maximum sound level needed.

“REMOTE“ connector and clip indicator. The clip indicator light on the connector panel will turn from green to yellow to indicate clipping, and then to red to indicate that the protection circuit has been activated. If this occurs frequently, use the “SYSTEM LEVEL” controls of the DSP subwoofer(s) to reduce the replay level until the light remains green.

If the clip indicator light on the connector panel is not easily visible, the optional Remote LED Kit can be used to bring the clip indicator light into view. The kit can be connected to the connector labeled “REMOTE”. This connector also allows for several standard Genelec Remote Controls to be connected to the subwoofer. The Genelec remote controls can activate the bypass and the “LFE +10 dB” mode.

For further information about the subwoofer stand-alone operation, consult the SE7261A Subwoofer Operating Manual.

FUNCTION REFERENCE

This section describes individual functions in detail. Functions are presented in alphabetical order.

Genelec AutoCal™

Genelec AutoCal™ performs automatic calibration of a multi loudspeaker system setup. It aligns every loudspeaker in the setup for flat frequency response, equal virtual distance and the same sound pressure level.

In order to use Genelec AutoCal™

- A Genelec 8200A Calibration Microphone must be set up at the main listening position.
- The microphone must be connected to the GLM Network Interface device
- The GLM Network Interface device must be connected to the loudspeaker control network cable, 8200A measurement microphone, computer USB port, and sound card line input port in the computer

Genelec AutoCal™ is accessible in the System Setup Wizard and in the Setup Tab in the GLM.SE™ main window. (Menu path: Setup | GLM.SE™ Acoustic Wizard | AutoCal™).

Launch Genelec AutoCal™ by clicking the “Yes” button. After that, Genelec AutoCal™ works automatically and without user intervention. One loudspeaker at a time will produce a sweep tone, starting with the SE7261A. The sweep responses are recorded by Genelec AutoCal™. After that, Genelec AutoCal™ takes some time to calculate the appropriate settings for each loudspeaker in the system, and stores the resulting settings in the System Setup file. The progress indicated in the Genelec AutoCal™ window. The total amount of time Genelec AutoCal™ takes to calibrate the system depends on the number of loudspeakers in the system.

For a presentation about the use of Genelec AutoCal™ see section “Genelec AutoCal™ - Automatic System Calibration” in the System Operating Manual.

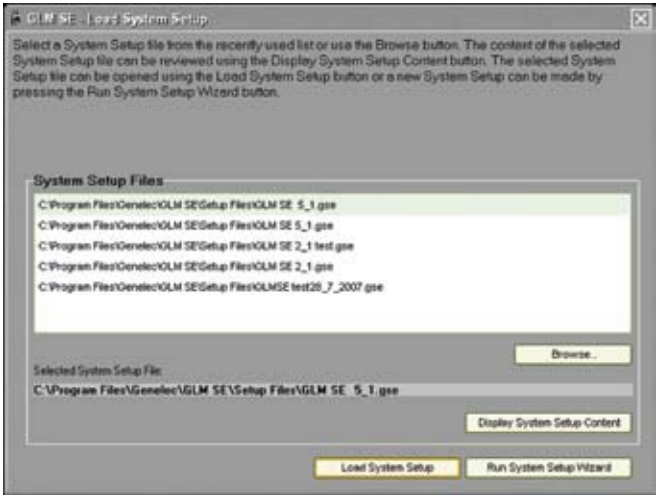
SE7261A Online

This window appears when first starting GLM.SE™. It verifies the status of the SE7261A currently on the Genelec Control Network. If the SE7261A is not recognized check that the power switch is ON and the subwoofer is connected to the network. If the total length of the control network is more than 300 meters (900 feet), contact the Genelec distributor for more information.

Load Setup

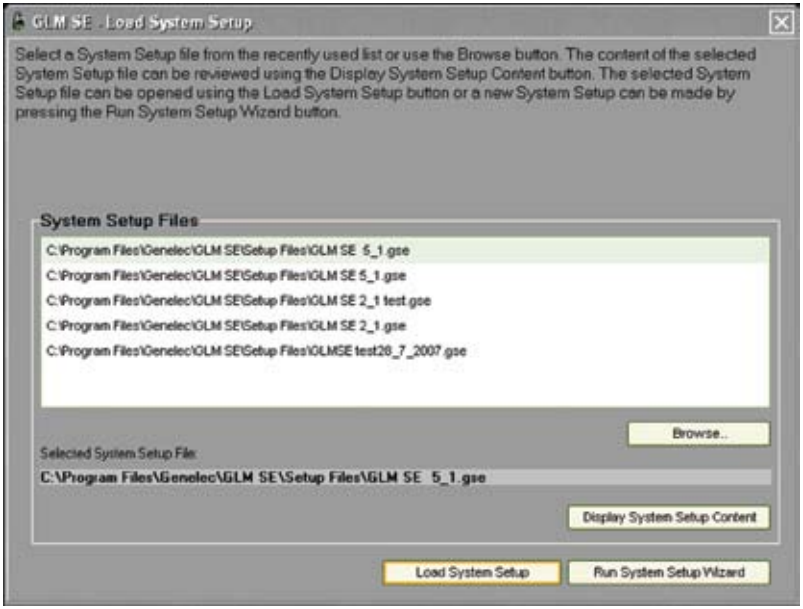
This window appears after the Loudspeakers Online window. It displays a maximum of five recently used System Setup files. Select a System Setup file from this list.

- Use the browser to search for any System Setup files on the computer. Click the “Browse…” button.
- After having selected a System Setup file, view its content by clicking the “Display Content” button.
- Load the System Setup file by clicking the “Load” button.
- To make a new System Setup, click the “Run Wizard” button.



Use the “Load System Setup” window to

- Select a System Setup file from the recently used files list
- Browse System Setup files
- Display the content of a selected System Setup file
- Load a selected System Setup file
- Run a System Setup Wizard to create a new System Setup file



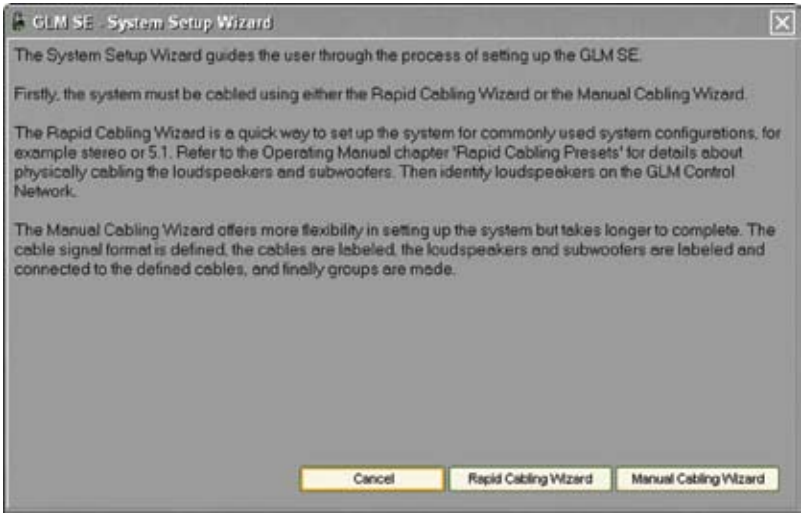
Wizard Introduction

There are several Wizards to help with loudspeaker system setup and acoustical alignment.

When launching the GLM.SE™ for the first time, the System Setup Wizard will run automatically. Later, changes to the System Setup file can be made using the System Setup Wizard again. The System Setup Wizard can be started in the GLM.SE™ Main Page using menu item “File | New”.

The Setup Wizard allows selection between Rapid Cabling Wizard and Manual Cabling Wizard.
The Rapid Cabling Wizard is fast and effortless, but supports only the most typical loudspeaker arrangements. Most System Setup tasks will be completed automatically. See the Rapid Cabling chapter for details.

The Manual Cabling Wizard should be used if the loudspeaker arrangement or the audio channel cabling does not conform to the existing Rapid Cabling schemes. Manual Wizard allows a great deal of flexibility and freedom, but takes a bit more time to complete. See the Manual Cabling Wizard chapter for details.



Rapid Cabling Preset Selection

This window appears when launching the Rapid Wizard.

Rapid Wizard makes cabling up the loudspeaker system very fast and effortless by allowing one of the ready-made audio cabling schemes to be selected. Once a scheme has been selected, the Rapid Wizard will make most system definitions automatically.

The Rapid Cabling Presets available are

- Stereo pair with subwoofer
- 5.1 system (five full-bandwidth audio channels and one LFE audio channel, reproduced by five loudspeakers and a subwoofer)
- 6.1 system (six full-bandwidth audio channels and one LFE audio channel, reproduced by six loudspeakers and a subwoofer)
- 7.1 system (seven full-bandwidth audio channels and one LFE audio channel, reproduced by seven loudspeakers and a subwoofer)

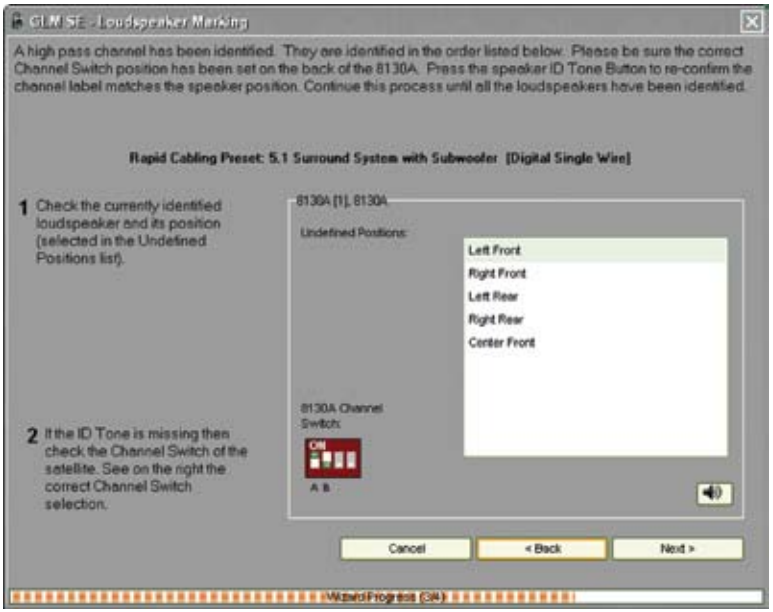
These Rapid Cabling Presets are available for Digital single-wire signal type. Select the appropriate scheme in the Rapid Cabling Preset window and click “Next”. This starts Rapid Wizard setup process.

Loudspeaker Marking

This window is used with the Rapid Cabling Wizard.

Rapid Cabling allows selection of one of the ready-made digital audio cabling schemes. After having selected a scheme and cabled up, Loudspeaker Marking window allows the GLM.SE™ to assign each loudspeaker to an audio channel name available in the Rapid Cabling scheme.

While displaying this window, one loudspeaker at a time will produce an audible identification tone from the loudspeaker to help locate it. The identification tone can be repeated by clicking the small loudspeaker icon. When using Rapid Cabling Presets, all identification tones start from output 1A (Left Channel, output 1). When using Manual Cabling Setups the first identification tone will come from the “A” side of the first connector that is used on the SE7261A. Then click the “Next” button. After this another loudspeaker will be selected by the GLM. SE™. Again, match and affirm the described loudspeaker matches its actual position and click “Next”. This process will continue until all the loudspeakers have been identified. The GLM.SE™ selects the loudspeakers in the order in which they are wired to the subwoofer – starting with Channel (sub-frame) A, then B (if it is used).

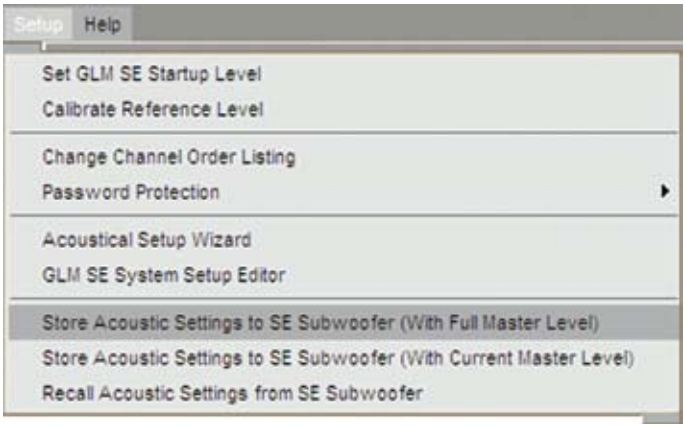


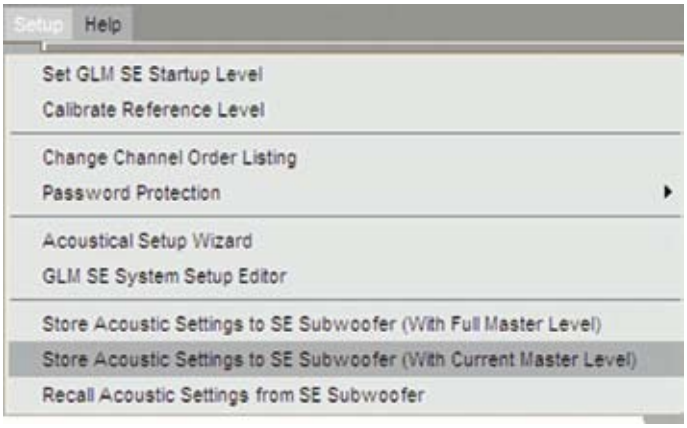
Storing the Acoustic Settings in GLM.SE™

There are two-ways to set the acoustic settings in GLM.SE™ system. The settings can be stored with the full GLM.SE™ master level (if the source has a level control) or with the current GLM.SE™ master level (if the source does not have a level control).

To store the acoustic settings with the full GLM.SE™ master level select “Store Acoustic Settings to SE subwoofer (With Full Master Level)” from Setup menu.

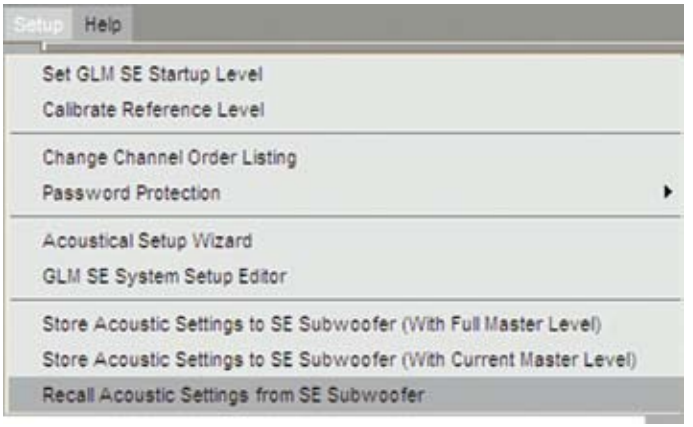
To store the acoustic settings with the current GLM.SE™ master level select “Store Acoustic Settings to SE subwoofer (With Current Master Level)” from Setup menu. This enables the system to have a stored volume setting at something less than full level. Be sure to check the master level before storing this setting.



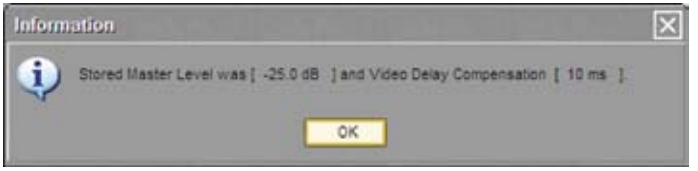


Recalling the Acoustic Settings in GLM.SE™

It's possible to recall the stored acoustic settings from SE subwoofer. To recall the acoustic settings select "Recall Acoustic Settings from SE Subwoofer" from Setup menu. NOTE: Settings will be read over the loaded setup file and original settings will be overwritten when save. Use "Save As" to keep the original setup file.



After the settings are recalled GLM.SE™ will show the GLM.SE™ master level that was used when the acoustic settings were stored. Also the amount of the Video Delay Compensation stored will be displayed.



System Audio Connections

The System Audio Connections window presents a summary of the audio channel definitions created and loudspeakers associated with each audio channel.

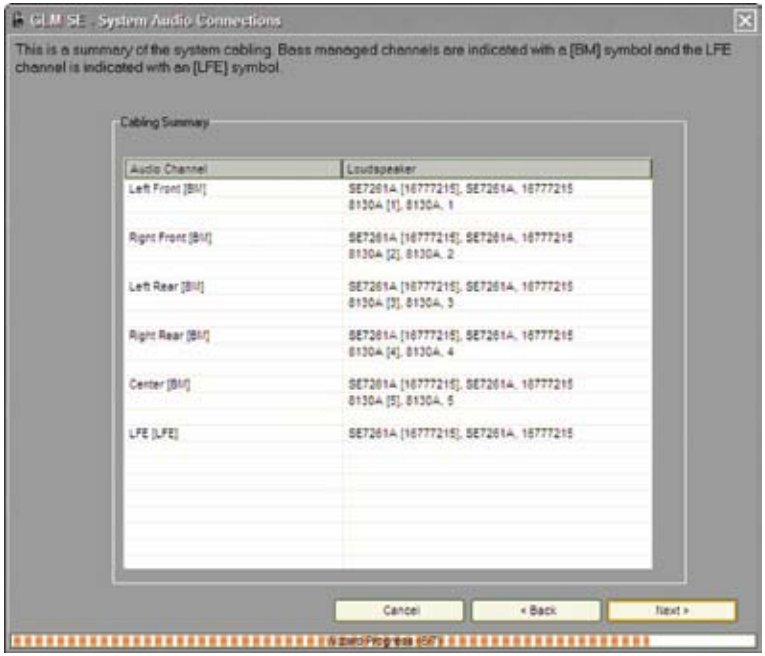
Manual Cabling

This System Audio Connections window is displayed when the Manual Cabling option is run with the System Setup Wizard.

The letters [BM] appear after an audio channel name if the channel is bass managed. The letters [LFE] will appear after an audio channel name if the audio channel has been assigned to reproduce a Low Frequency Effects channel (LFE channel).

Verify that the information is correct. Use the Back button to reverse through the Cabling Wizard to a point where necessary corrections are required. When the information is correct, click “Next” to accept the

System Audio Connections. This completes the System Setup process so the settings should be saved in a System Setup file. After this proceed to run the Acoustical Setup Wizard.

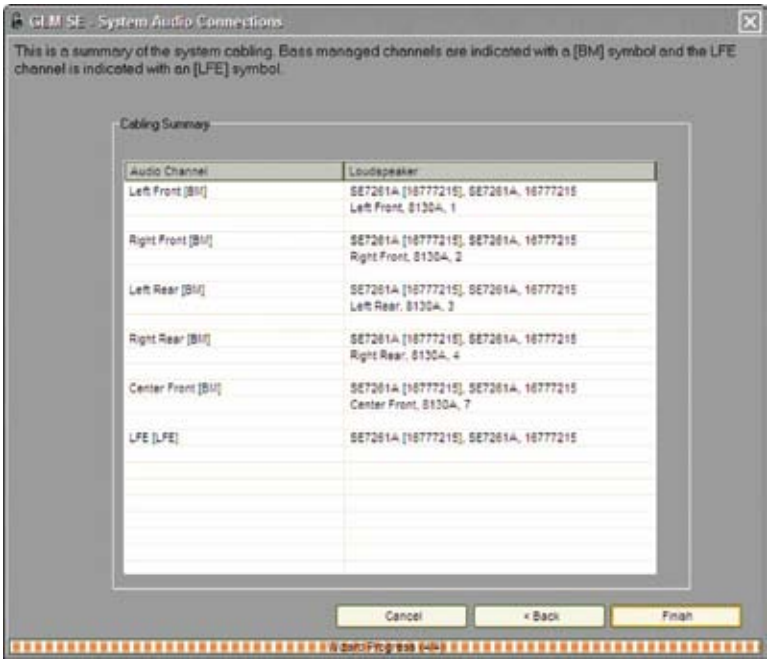


Rapid Cabling

The System Audio Connections window (below) is displayed when running the Rapid Cabling option of the System Setup Wizard. This window is shown after Loudspeaker Marking has been completed.

The letters [BM] are shown after an audio channel name if the channel is bass managed. The letters [LFE] are shown after an audio channel name if the audio channel has been assigned to reproduce the Low Frequency Effects channel (LFE channel).

Verify that the information is correct. Use the Back button to reverse through the Cabling Wizard to a point where necessary corrections are required. When the information is correct, click “Next” to accept the System Audio Connections. This completes the System Setup process so the settings should be saved in a System Setup file. After this proceed to run the Acoustical Setup Wizard.



Signal Format

The SE7261A subwoofer only accepts AES audio in the single wire mode. This mode carries two channels of audio in each cable. Audio sample rates can be from 32 kHz to 200 kHz. Audio word length can be from 16 to 24 bits.

Audio Cable Definition

The GLM.SE™ has no way of knowing how many audio cables there are in the system and how digital audio channels have been assigned in each cable. Describing the system is done using the Audio Cable Definition window.

This window defines how audio cables are connected to the system. Descriptive names can be given to the audio channels carried by each cable. Define the type of audio in these channel(s) as either a Main Channel (full bandwidth audio) or an LFE Channel (band-limited audio channel).

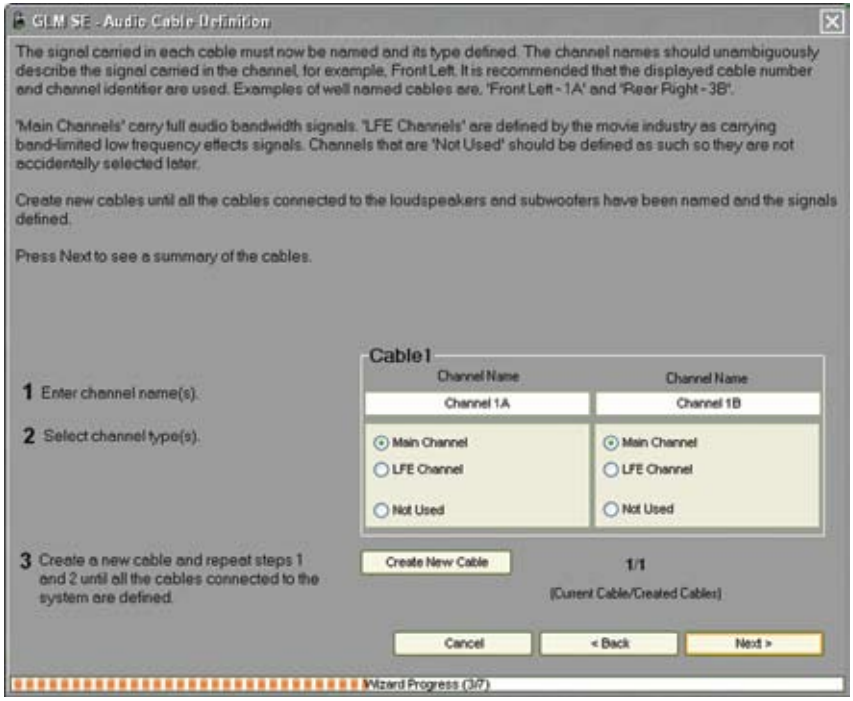
After completing the description of an audio cable, create more audio cables by clicking the Create New Cable button. Keep creating new cables until descriptions for all audio cables in the system have been created. Up to four cables can be created. If too many audio cables are accidentally created, there is

an option later to delete them. When creating descriptions of all audio cables has been completed, click “Next”.

Move back through the cable definitions by clicking the “Back” button to correct any mistakes and make changes

Digital Audio, Single-Wire Mode

This window shows that the digital audio cable can carry two audio channels. Select the type of audio as either a Main Channel or an LFE Channel. If only one of the two available channels is actually being used in a cable (the other channel is not actually carrying audio), select “Not Used” for the vacant channel to avoid accidentally selecting it later.

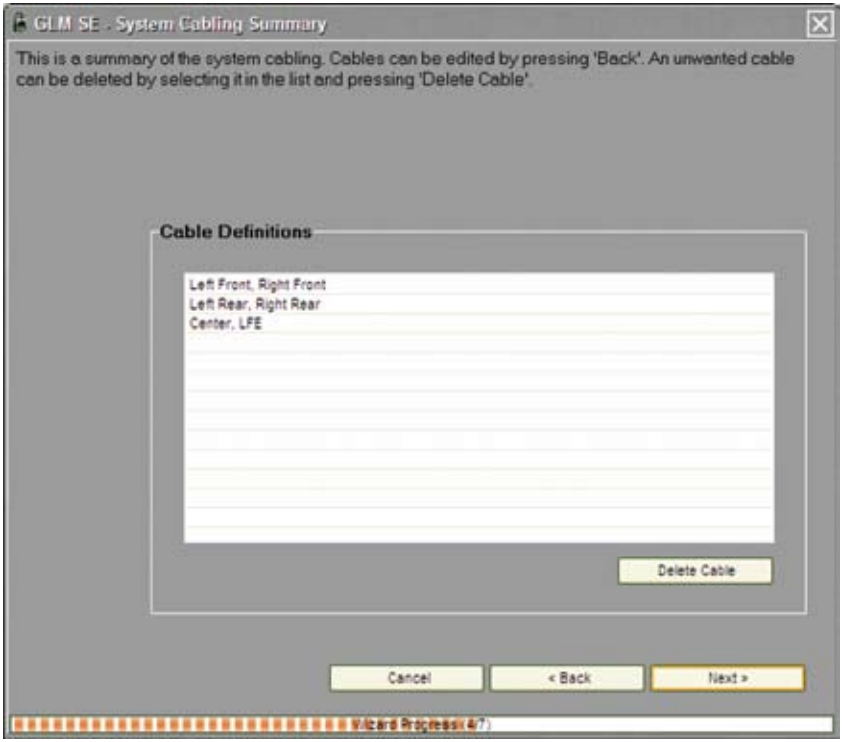


Audio Cabling Summary

After creating definitions of the audio cables in the loudspeaker system, this Audio Cabling Summary is presented.

In this window is a summary of the cables in the system. There is a list of given names of the audio channels carried by each cable. For the standard Single-Wire digital audio mode, two audio channels will be shown per one cable.

Verify that the information shown is correct. Then click “Next” to accept the list.
Use the “Back” button to move back through the Wizard to correct any errors in definitions.



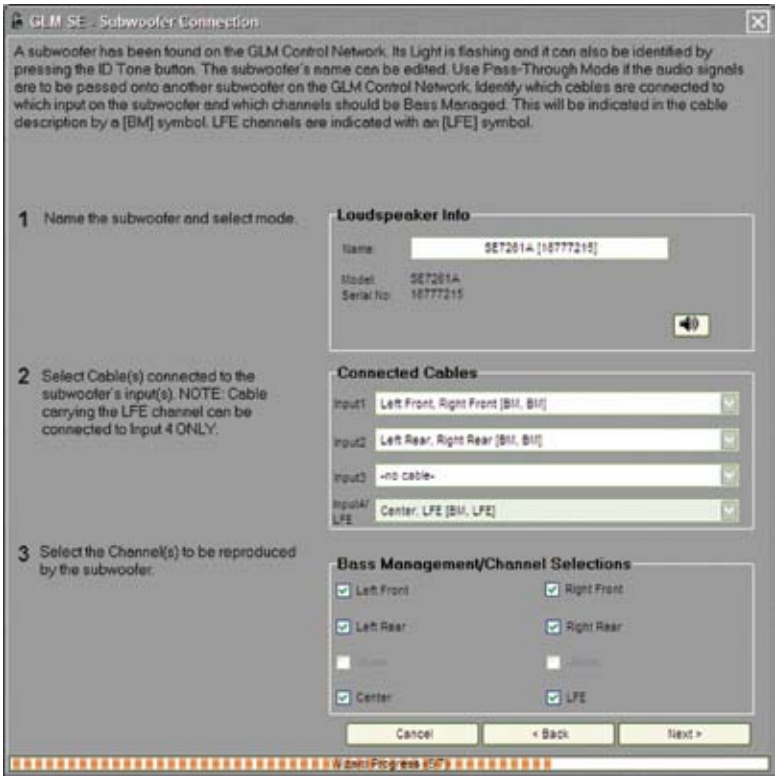
Loudspeaker Connection

This window tells the GLM.SE™ what cables are physically connected to each loudspeaker in the system and what audio channels this loudspeaker will reproduce. One AES/EBU digital audio cable typically carries two audio channels. Loudspeakers can accept one audio cable. Subwoofers can accept four audio cables. So the loudspeaker connection window will look slightly different for each case.

SE7261A Subwoofer

First give the subwoofer a descriptive name so that it is easy to recognize later.
Select the names of cables physically connected to the subwoofer's inputs. Once a cable is selected for an input, the audio channels in the cable become selectable for this input. Select which channels in each cable the subwoofer should reproduce. These channels will be bass managed if the [BM] symbol appears in the cable description.

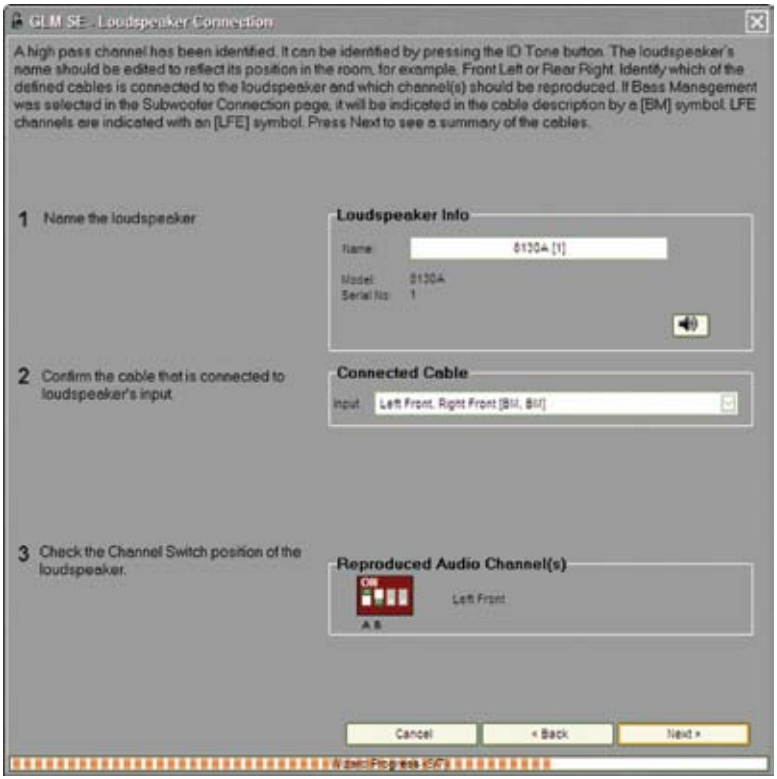
To complete the loudspeaker connection assignments for this loudspeaker, click the "Next" button.



8130A Two-way Loudspeaker.

First give a descriptive name for loudspeaker so that it is easy to recognize later. A loudspeaker can accept only one audio cable. Once the cable has been selected, the channels carried in the cable become manually selectable as inputs in the loudspeaker. Be sure to match the intended audio to the loudspeaker's position. Select the audio channel(s) this loudspeaker should reproduce.

To complete loudspeaker connection assignments for this loudspeaker, click the Next button.



Floating Level Fader

The level fader allows control of the playback sound level. It appears either as a part of the GLM.SE™ Main Page or as a small floating window.

The small floating fader saves space on the display. Select the floating fader by clicking the “Fader Only” button in the main GLM.SE™ Main Page.

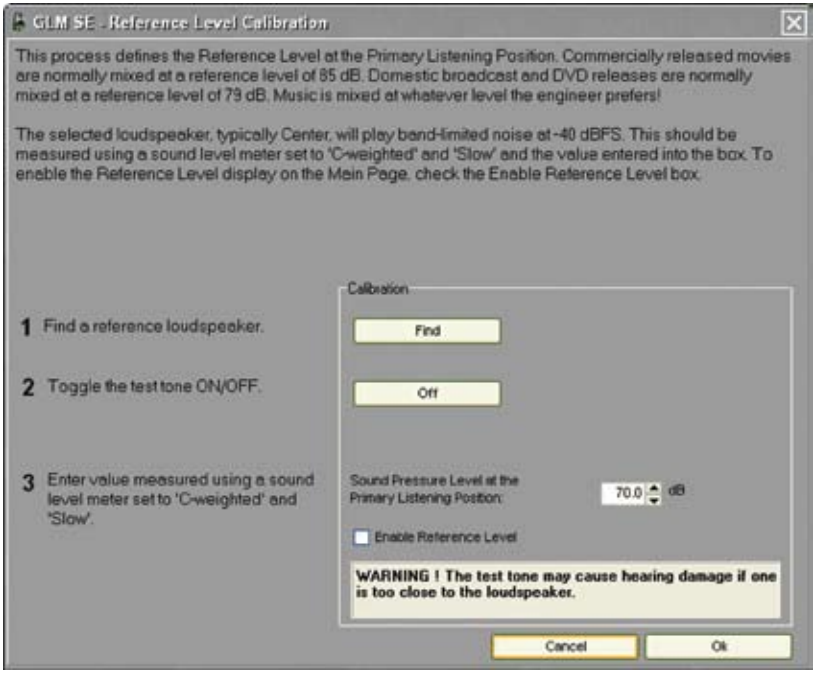
The floating fader allows to:

- Control the monitoring level
- Operate subwoofer bypass (Bypass Sub)
- To silence all loudspeakers (Mute All)
- Select one of three preset monitoring levels
- Change preset levels (select a preset icon, hold down the Shift key, drag the fader)
- Return to the normal GLM.SE™ view (back to Main Page)

Reference Level Calibration

The GLM.SE™ allows easy calibration of the monitoring sound level to a standard reference value. This working method is commonly seen in work destined for theatrical release for TV (85 dB SPL) or radio broadcast (79 dB SPL).

The reference sound level is displayed on the GLM.SE™ Main Page below the “DIM –20 dB” button. The default value for this has been set such that a single loudspeaker placed at a 2-meter (6-feet) distance will produce a sound level of 80 dB SPL with the internal two-octave pink noise generator set to ON.



In order to get a meaningful reading:

- Run Genelec AutoCal™ to calibrate the Acoustical Settings of the loudspeaker system
- Run the Reference Level Calibration

In order to calibrate the system reference level

- Open the calibration window using menu item “Setup | Calibrate Reference Level”
- Use the “Find” button to locate the loudspeaker to be used for calibration. Typically the Front Center is used for multi-channel systems.
- Turn on the pink noise generator by clicking the “On/Off” button.

- Use a sound level meter to obtain a reading of the sound pressure level at the primary listening position.
- Enter the obtained value into the “Sound Pressure Level at the Primary Listening Position” box.
- Click “OK” to save the setting and to complete calibration and return to the GLM.SE™ Main Page.

Uninstalling GLM.SE™

Windows

GLM.SE™ uninstaller can be launched from Start menu by clicking ‘Uninstall GLM.SE™’.
This removes GLM.SE™ application from the system. If GLM.SE™ and GLM.SE™ Autolink are running, close them before launching the uninstaller.

Macintosh

The following steps should be followed to delete the complete installation of GLM.SE™. Close GLM.SE™ and GLM.SE™ Autolink applications if running, before starting the uninstallation.

Step 1: Remove the following folders and contents created by GLM.SE™

a) /Library/Application Support/Genelec/GLM_SE
b) /Applications/Genelec/GLM_SE
c) ~/Library/Application Support/Genelec/GLM_SE
d) ~/Documents/Genelec/GLM_SE (Note: Do not delete if you want to keep old setup files)

Folders deleted in task c) and d) need to be deleted from all users separately.

Step 2: Remove GLM SE and Library packages (GLM_SE.pkg and DSP_Applications_SE.pkg) from the system, located at /Library/Receipts.

Step 3: Remove the GLM.SE™ icon from the Dock (delete from all users separately)

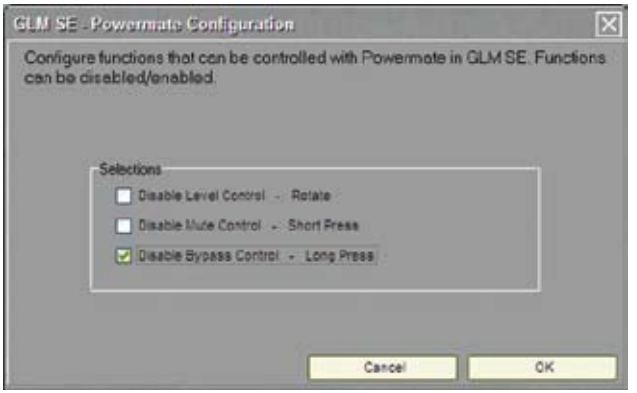
The GLM.SE™ Autolink application can be removed from the Menu bar by removing the application from the login items (Note: close GLM.SE™ Autolink application first).

a) Open system preferences
b) Go to Accounts and select an account from which GLM.SE™ Autolink application needs to be removed.
c) Delete the GLM.SE™ Autolink from the Login Item list.

Delete the GLM.SE™ Autolink application from the /Application/Genelec/GLM_SE to delete it completely.

Configurable settings for Powermate knob

Powermate functions can be disabled/enabled as desired in each individual Setup file. For example bypass function can be disabled to avoid unwanted bypass. These functions can be edited by opening a config window from the main menu (Setup->Configure Powermate Controls).



When unselecting a function and clicking the OK button, the new configuration will be saved and used in the saved Setup file.

GLM.SE™ AutoLink Application

GLM.SE™ AutoLink is a stand-alone application that can be used to communicate with GLM.SE™ via different shortcut key combinations. The operations that can be done via GLM.SE™ AutoLink application are:

- Load setup files
- Increase level
- Decrease level
- System Mute

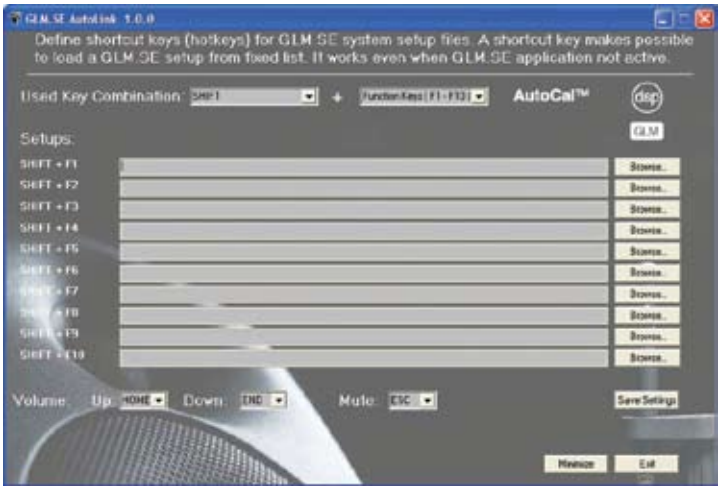
GLM AutoLink shortcuts allow changing the system level or loading setups if GLM.SE™ is not active (running on the background).

Tips for GLM.SE™ AutoLink use

Windows:

GLM.SE™ AutoLink can be launched from c:\Program Files\Genelec\GLM SE\GLM_SE_AutoLink.exe.

To launch GLM.SE™ AutoLink application at system startup, drag'n'drop GLM_SE_AutoLink.exe into Startup folder in Windows Start menu.



To prevent GLM_SE_AutoLink launch at startup, remove GLM_SE_AutoLink shortcut from Startup folder.

Macintosh:
GLM.SE™ AutoLink can be launched from /Applications/Genelec/GLM_SE/GLM_SE_AutoLink.

When GLM.SE™ AutoLink is lauched once, it will be automatically launched when loggin.

To prevent GLM.SE™ AutoLink launch at startup:

a) Open System preferences
b) Go to Accounts and select the account from which GLM.SE™ AutoLink needs to be removed.
c) Delete GLM.SE™ AutoLink from the Login Item list.

Keyboard shortcuts in the Windows version of GLM.SE™

Shortcut Key Combination	Description	Does GLM. SE™ need to be selected?
Shortcut key combinations available in the GLM.SE™ software		
Shift + F1	Load the first Setup File in the Recently Used List	YES
Shift + F2	Load the second Setup File in the Recently Used List	YES
Shift + F3	Load the third Setup File in the Recently Used List	YES
Shift + F4	Load the fourth Setup File in the Recently Used List	YES
Shift + F5	Load the fifth Setup File in the Recently Used List	YES
Shift + 1	Set the Preset Level number one	YES
Shift + 2	Set the Preset Level number two	YES
Shift + 3	Set the Preset Level number three	YES
F1	Open the GLM.SE™ Help	YES
Ctrl + O	Setup Open Dialog, open a system setup	YES
Ctrl + S	Save the current system setup	YES
Shortcut function available for the Powermate controller		
Rotate Left	Decrease the volume in -0.5 dB steps	NO
Rotate Right	Increase the volume by +0.5 dB steps	NO
Short Press	Mute/Unmute	NO
Long Press	Bypass bass management	NO
Shift + Rotate Left	Decrease the volume in -1.0 dB steps	NO
Shift + Rotate Right	Increase the volume in +1.0 dB steps	NO
Shift + Ctrl + Rotate Left	Decrease the volume in -2.0 dB steps	NO
Shift + Ctrl + Rotate Right	Increase the volume in +2.0 dB steps	NO
Ctrl + Rotate Left	Browse Groups Down	NO
Ctrl + Rotate Right	Browse Groups Up	NO

Keyboard shortcuts in the Mac version of GLM.SE™

Shortcut Key Combination	Description	Does GLM.SE™ need to be selected?
Shortcut key combinations available in the GLM.SE™ software		
Shift + F1	Load the first Setup File in the Recently Used List (*)	YES
Shift + F2	Load the second Setup File in the Recently Used List (*)	YES
Shift + F3	Load the third Setup File in the Recently Used List (*)	YES
Shift + F4	Load the fourth Setup File in the Recently Used List (*)	YES
Shift + F5	Load the fifth Setup File in the Recently Used List (*)	YES
Shift + 1	Set the Preset Level number one	YES
Shift + 2	Set the Preset Level number two	YES
Shift + 3	Set the Preset Level number three	YES
Command + ?	Open the GLM.SE™ Help	YES
Command + O	Setup Open Dialog, open a system setup	YES
Command + S	Save the current system setup	YES
Shortcut function available for the Powermate controller		
Rotate Left	Decrease the volume in -0.5 dB steps	NO
Rotate Right	Increase the volume by +0.5 dB steps	NO
Short Press	Mute/Unmute	NO
Long Press	Bypass bass management	NO
Shift + Rotate Left	Decrease the volume in -1.0 dB steps	NO
Shift + Rotate Right	Increase the volume in +1.0 dB steps	NO
Shift + Command + Rotate Left	Decrease the volume in -2.0 dB steps	NO
Shift + Command + Rotate Right	Increase the volume in +2.0 dB steps	NO
Command + Rotate Left	Browse Groups Down	NO
Command + Rotate Right	Browse Groups Up	NO

(*) On most Mac laptops, some of the function keys are used to control hardware features:
F1 – decrease brightness, F2 – increase brightness, F3 – mute, F4 – decrease volume, F5 – increase volume, F6 – num lock
If these function keys are wanted to use as standard shortcuts, you must use the fn key. For example to open the second setup file from the recently used setup file list you must use SHIFT + fn + F2 key combination

FREQUENTLY ASKED QUESTIONS

Product

Is there a chance that I will ruin the sound with all the features the SE system offers if I don't understand what I am doing?
As the system is very flexible and powerful, there are many ways to configure the systems and huge possibilities to modify the loudspeaker responses, phase, crossover, etc. To avoid time consuming adjustment procedures and provide the correct parameter settings in a very short time, Genelec has developed the simple-to-use AutoCal™ to help quickly and painlessly setup and calibrate the system.

How do I recognize an GLM.SE™ system?
The GLM.SE™ user interface software can be recognized during startup by the content in the start-up flush screen. During use, the Help | Info menu command opens a screen that helps to recognize the software and tells its version number.

What is the network for?
The GLM Control Network allows for communication, control and monitoring (telemetry) between the GLM.SE™ software and the loudspeakers on the network. The GLM Network Interface translates information between the GLM Control Network and the computer hardware acting as the network master and managing all the loudspeakers. The GLM Control Network was carefully designed for robustness ensuring that audio continues even if the network is disconnected or the computer running the GLM.SE™ software crashes.

Does the quality of today's soundcards and the Genelec 8200A microphone affect the measurements used for AutoCal™?
The basic soundcards in laptops are of sufficient quality for making in-room measurements to equalize loudspeakers and subwoofers. AutoCal™ compensates for the low frequency response of the soundcard during AutoCal™ measurement startup, using an input calibration procedure. All Genelec 8200A Calibration Microphones are serial numbered and each comes with an individual equalization curve automatically used during AutoCal™. This ensures reliable system calibration for accurate acoustical measurements.

Do the switches sum with the internal settings?
Loudspeakers and subwoofers are under network control when there is an operating GLM Network connected to them. The settings in the GLM System Setup file apply. If there is no network control (Stand-Alone Mode), the settings stored in SE7261A subwoofer are used when a switch is set to select "Stored Settings". The acoustic response control switches on digital input loudspeaker are always active. The acoustic control switches in SE7261A subwoofer are only operational when a switch is set to "Manual Control". These three

modes of operation (GLM.SE™ controller, stand-alone using stored settings, and stand-alone using manual controls) are independent of each other – one set of controls does not sum with another.

Where does the volume control happen?
Genelec DSP loudspeakers and subwoofers implement volume control as a part of digital signal processing. Volume control decreases the digital values in the digital audio data just before the data is written into the DA converter or AES outputs. Decreasing the value makes the sound level lower. The command to set the volume to a certain level is created in the computer GLM user interface software and mediated using the loudspeaker control network. No audio data travels on the control network.

What is the quality of digital audio when attenuated using Genelec volume control?
It is well known that attenuation of the digital audio signal in a DSP processor decreases the number of significant bits representing the data. This is called quantization. Coarse quantization (very few bits representing the data) can lead to distortion if the data is not processed properly.

There is a standard technology that eliminates this quantization distortion in digital signal processing. This technology is called dithering. Genelec uses proper dithering at the volume control operation to ensure that the signal after the volume control is a perfectly linear digital audio signal, and no distortion is generated. There is no increase in the audible or measurable distortion level in Genelec DSP loudspeakers and subwoofers when the volume is reduced, and the signal maintains its original linearity and smoothness. The only audible consequence of lowering the volume setting is that the sound level decreases.

Connectivity

Do I have to have all cables sent with the system connected at all times?
No. The only cables that MUST be connected are the AES/EBU signal cables and mains power cables. The DSP system can be used in Stand-alone Mode and may be setup in two-ways:

- The system is setup using the controls on the 8130A back panel and SE7261A connector panel. The GLM.SE™ Control Network is not required in this case (Stand-alone – Manual Controls mode).
- The system is setup using the GLM.SE™ and, using the GLM.SE™ Control Network, the parameters uploaded to the loudspeakers" internal memory. Once this is done the network may be disconnected (Stand-alone – Stored Controls mode).

In both cases, GLM.SE™ control of mutes, groups and other functions is not possible and volume control must be done at the source.

The USB cable, GLM Network Interface and the network cables only needs to be connected if the monitoring system is being run in Network Control mode with the GLM.SE™

The Genelec 8200A Calibration Microphone and measurement signal cable only needs to be connected when AutoCal™ is being run.

Can I use analog outputs from my sound source?
Yes. Genelec offers a high quality eight channel AD converter AD9200A to enable easy interface to all analog sound sources.

Can I use standard CAT5, CAT5e, or CAT6 Ethernet cable with DSP products?
Yes. The GLM.SE™ network uses standard Ethernet cables to connect together all the loudspeakers and subwoofers on the network. The data rate used in the GLM.SE™ Control network is low by Ethernet standards and is therefore an easy signal to transmit reliably.

The difference between the CAT cable types is the maximum transmission data rate: CAT5 is rated to 100M, CAT5e is rated to 350M, CAT6 and CAT6e are rated to 550M or 1000M depending on the source, and CAT7 is supposedly rated to 700M or presumably 1000M. Both CAT5 and CAT5e have 100 ohm impedance and electrical characteristics supporting transmission rates up to 100 MHz. There are some electrical differences between CAT5 and CAT5e: capacitance, frequency, resistance, and attenuation.

Can I connect the SE7261A subwoofer to an Ethernet network and control them from another room?
No, do not connect the control network to an Ethernet signal. The Genelec DSP monitors can only be connected to the Genelec proprietary GLM network. It uses a proprietary communication protocol to ensure maximal integrity of communication to the loudspeakers and to remain fully insulated and secured from any public networks prone to traffic congestion, as well as to limit the range of access - we don't want someone in another studio controlling your loudspeakers!

How do I connect a USB audio output?
A USB audio source can be if it supports AES/EBU signal output format or the AD9200A analog-to-digital converter if it is an analog output device.

Are all channel pairings known?
The channels in each AES/EBU cable must be known before connecting up the system. This is normally the case in production studios. Note that different equipment and multichannel formats have different channel pairings and orders. To help avoid cabling mistakes, sticky cable labels are supplied in the GLM. SE™ DSP Genelec Loudspeaker Manager package. We strongly encourage their use.

How do I connect the audio cables to a system with a subwoofer?
First connect the audio cables to the subwoofer and then continue on to the loudspeakers.

Software

Can I install the GLM.SE™ on another PC and use the program on both computers?
The GLM.SE™ Loudspeaker Manager comes with a site license, which means you can install the software on as many computers as you like within a facility. Additional GLM Network Interfaces can be purchased (GLM Multiroom Expansion Package) to allow GLM Network Control in more than one room.

My soundcard doesn't work with AutoCal™, what are you going to do about it?
We have tested AutoCal™ on many computers but it is impossible to test every computer available today. Please report any soundcard problems back to Genelec so the measurement part of the software can be made even more robust in the future. In the short term, try installing the software onto another computer to see if the problem is with the computer or the network and loudspeakers. If problem remains, please contact your country specific distributor for product servicing and support.

AutoCal™ can be run on another computer and the System Setup files copied to the "not working" computer:

- Go to the installation directory of the GLM.SE™ software. The GLM.SE™ software installation directory is typically C:/Program Files/Genelec/GLM SE. Go the subdirectory "Setup Files".
- Find a subdirectory with the same name as the system calibration you want to copy. It is appended with the text "_AutoCal™". For example, your system setup is called "MySystemSetup". Then, the directory is called "MySystemSetup_AutoCal™". Copy this directory to the other computer.
- Find the System Setup file which has the name of your System Setup and the file name extension ".GSE". For example, your system setup is called "MySystemSetup". Then, the system setup file is called "MySystemSetup.gse". Copy this file to the other computer.

How often should I upgrade the software of the DSP? Should I pay for the new version?
Software updates and upgrades will be clearly announced on the web site, www.genelec.com.

Can I upgrade the software via the web?
There will be a download page on the Genelec website, www.genelec.com.

How do I make settings for different positions in the room and switch between them?
AutoCal™ can be performed for different locations in the room, for example engineer's position and

producer's position, and the settings stored in System Setup files which may be instantaneously recalled.

Who makes the mic?
The 8200A Calibration Microphone has been specifically designed for use with AutoCal™ and is manufactured and calibrated by Genelec.

Can I use any microphone and pre-amplifier?
The 8200A Calibration Microphone only works with the GLM Network Interface and, conversely, the GLM Network Interface only works with the 8200A Calibration Microphone. In addition, the microphone is calibrated when it is manufactured by Genelec, and the data used by AutoCal™ to compensate for the microphone response. No other microphone will work accurately in this system. This is why the 8200A Calibration Microphone is included in the GLM.SE™ Loudspeaker Manager software package.

When should I run AutoCal™?
AutoCal™ can be run at any time; however, there is little reason to repeat the process unless:

- The loudspeakers have been moved
- The listening position has changed
- There is a change in the acoustic conditions – equipment moved, acoustic treatments applied, walls moved, etc.
- You wish to calibrate for another listening position
- You wish the verify that the system is still working correctly
- You wish to show off your new DSP loudspeaker system

I am used to loads of bass in the monitoring so can I have it?
The goal of a monitoring system is to faithfully convert the electrical signal presented to its inputs to sound pressure at the listening position. It should add nothing to the sound nor take anything away. AutoCal™ equalizes the response of the system to be as flat as possible thereby trying to get as close to the goal as possible. If the listeners target response is not a flat magnitude response, the Acoustical Settings can be fully adjusted as required. The net effect on the measured response can be seen in the Interactive Response Editor.

Problems and Support

Who should I contact if I run into troubles with the setup?
Each country has a distributor and within that distributor is a DSP Product Specialist who has been trained by Genelec to support the DSP products. Only distributors with an approved DSP Product Specialist are

entitled to distribute the DSP products. Contact details for your distributor are available on the Genelec web site: go to www.genelec.com and click on “Sales Network”.

My system is not working, what should I do?
There are a number of ways you can try to get your system working again:

- Read the System Operating Manual or the contact-sensitive help in the GLM.SE™ software
- Read more of these FAQ’s
- Contact the DSP Product Specialist at your distributor

If you think you have found a bug in the software, please report it so it can be replicated, evaluated and then fixed.

What should I do if a loudspeaker breaks and I send it for service, does it or the system have to be recalibrated?
Once the loudspeaker has been repaired, it can be reconnected to the GLM Control Network. If the serial number of the loudspeaker is the same, the GLM control network will recognize it immediately and operation will continue as before. The acoustical parameters are stored in a System Setup file and so all these parameters can be uploaded again at any time into the loudspeaker for use in Stand-Alone Mode.

If the loudspeaker has a different serial number because it was replaced with a new unit, follow the “Replacing and Removing Loudspeakers in a System Setup File” procedure as explained in the GLM. SE™ User Manual. The Acoustical Settings will then be assigned to the new loudspeaker.

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